Closing the digital divide: an assessment of urban graduate teacher education students' knowledge of information literacy and their readiness to integrate information literacy into their teaching

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CLOSING THE DIGITAL DIVIDE: AN ASSESSMENT OF URBAN GRADUATE TEACHER EDUCATION STUDENTS’ KNOWLEDGE OF INFORMATION LITERACY AND THEIR READINESS TO INTEGRATE INFORMATION LITERACY INTO THEIR TEACHING

A Dissertation
Presented to
The Faculty of the School of Education
Learning and Instruction Department

In Partial Fulfillment
of the Requirement for the Degree
Doctor of Education

by
Tyrone Heath Cannon
San Francisco
May 2007
This dissertation, written under the direction of the candidate's dissertation committee and approved by the members of the committee, has been presented to and accepted by the Faculty of the School of Education in partial fulfillment of the requirements for the degree of Doctor of Education. The content and research methodologies presented in this work represent the work of the candidate alone.

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5-7-07
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5-7-07
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CHAPTER I

INTRODUCTION TO THE STUDY

Statement of the Problem

Information literacy and the ability to use technology are fundamental proficiencies needed to be successful in school and in one’s chosen profession. While information literacy and information technology are closely linked, information literacy is a distinct and broader area of competence (O’Neil, 2005). Information literacy is an intellectual framework for understanding, finding, evaluating, and using information. These activities may be completed, in part, as a result of skill in using information technology, but the ability to understand, critically evaluate, and integrate information is independent of one’s technological skills (Information Literacy Competency Standards for Higher Education [ACRL], 2000).

While information literacy and technology are a part of daily life, access to technology remains elusive to some segments of society, particularly those who live in poor or urban communities. This lack of access is defined as the digital divide. Many of the K-12 schools in these communities are faced with limited technological resources and often do not have school librarian/media specialists (librarians with the Masters-in-Library Science or related degree who work in K-12 education) to help bridge the information and digital divide. As a result, these crucial school librarian/media skills are left to classroom teachers to instill in their students. Yet many K-12 teachers possess little or no information literacy/technology skills themselves (Asselin & Lee, 2002).

In a recent study, Valadez and Duran (2007) agreed that the digital divide characterizes the technology gap between the rich and the poor, but the authors felt the term
was simplistic in characterizing the full impact of the digital divide. While the digital divide, as a broad concept, defined the division between individuals who have access to technology and those who do not, the digital divide also describes inequalities in technology and learning. Local, state, and federal policies that provided funds for schools to purchase computers did not address the more important issues regarding poverty, inequality, and differential opportunities available to low and high socio-economic (SES) students (Valadez & Duran, 2007).

The definition of the digital divide should consider the number of computers available for teachers to use, the number of connections to the Internet, access to local area networks, home use of computers and the Internet, and the frequency with which the teacher engages the student in instructional strategies that include problem solving, data analysis, and word processing. Most educators agree that computer access and literacy are important and necessary for K-6 learners in the 21st century (Judge, Puckett & Bell, 2006). As many have suggested (Bertot, 2003; Clark, 2003; Fishman & Pinkhard, 2001; Mason & Dodds, 2005; Moore, 2000; Moore, Laffey, Espinosa, & Lodree, 2002) academic achievement is facilitated by access to computers at home and at school. The gap access is a major concern for educators who believe it is essential that all students, independent of their SES status, disability, language, race, or gender have access to information and communication technologies for learning.

Previous studies (Bansavich, 2005; Morner, 1993; Nero, 1999; O’Neil, 2005; Sheehy, 2001) have explored the information and technological competence of undergraduate and graduate teacher education students. This study was different because it examined the information literacy knowledge of graduate general and special teacher
education students and their readiness to integrate information literacy into their classroom teaching. Unlike some previous studies that have examined the information literacy knowledge of undergraduate education students (Nero, 1999, O’Neil, 2005), it was hoped that this study would represent greater student diversity in age, ethnic background, and those who taught in schools that were lower on the socioeconomic scale. This study was also characterized by the number of students who enrolled in the graduate teacher education program from previous careers.

This study explored whether there are differences between graduate teacher education credential special education students’ knowledge of information literacy from graduate teacher education credential general education students. In addition, this study asked are there differences in graduate teacher education students’ knowledge of information literacy from those who received training compared to those who did not. Many of these teacher education students represented central city school districts and will return to teach in them. Since no studies have specifically focused on the information literacy knowledge of graduate general and special education teacher education students who presently teach or plan to teach in urban, poor, school districts, this study contributed to the consideration of incorporating the knowledge of information literacy in teacher education curricula.

**Purpose of the Study**

The purpose of this study was to assess the information literacy knowledge of graduate general and special education teacher education students and their readiness to integrate information literacy into their classroom teaching. Special education teacher education students were included in this study to contribute to the literature addressing
the information literacy competence of pre-service and in-service special educators. The literature review completed for this study did not find specific literature that addressed special education teachers’ knowledge of information literacy. However, students with special needs will also need to be information literate and it is essential that special education teachers are prepared to contribute to the information literacy competency of their students.

According to the California Department of Education (CDE) (2006) special education student enrollment is outpacing special education teachers. There are 683,178 students enrolled in special education classes. The majority are students of color, yet the majority of the special education teachers are white. Between 1998 and 2003, there was a 7.4% increase in the number of students receiving special education services and only a 1.3% increase in the number of special education teachers (CDE, 2005). The teacher education students in this study were not traditional education students and represented diversity in age and ethnicity; for some, teaching was a second career. These teacher education students primarily taught in urban or low-socioeconomic schools in California where students may not have had access to either an on-site school librarian/media specialists or had technology in the home or school to assist in the development of their knowledge of information literacy. It is essential that graduate teacher education candidates are able to impart this knowledge to their students and thereby prevent them from being doubly penalized due to their economic status and lack of information literacy and technology skills.
Background and Need

In the twenty-first century, information literacy is more than a library concern. Information literacy is one of the most important campus-wide issues and is of strategic importance to all higher education stakeholders including administrators, faculty, librarians, media and information technologists, assessment coordinators, faculty development directors, service learning specialists, student affairs personnel, and career development professionals (Rockman, et al., 2004). In this study, information literacy was defined by the Information Competency Standards for Higher Education (2000) which stipulated that information literacy forms the basis for lifelong learning and is common to all disciplines, all learning environments, and all levels of education. Information literacy enables learners to master content, become self-directed learners, and assume greater control over their own learning. Information-literate individuals demonstrate this competence by being able to determine the extent of information needed; access the needed information effectively and efficiently; evaluate information and its sources critically; incorporate selected information into his or her knowledge base; use information effectively to accomplish a specific purpose; understand the economic, legal, and social issues surrounding the use of information; and access and use information ethically and legally. The *Beile Test of Information Literacy for Education* was designed to measure many of the information literacy competencies. Information literacy is a key responsibility of school librarian/media specialist and academic librarians (Donham & Bishop, 2001; Oberman & Strauch, 1982; Islam & Murno, 2006).

Despite the need for an information-literate population, many students begin their college experience without fundamental research and information literacy proficiency
(Rockman, et al., 2004; Breivik, 1998). While the majority of college students may have the skill to send electronic mail and instant messages or download music, they have not learned how to effectively locate, evaluate, incorporate, and integrate ideas to use information in original work or to assign proper credit for the information used in their term papers or theses (Rockman, et al., 2004). Regional accrediting agencies, such as the Western Association of Schools and Colleges (WASC), Middle States Association of Schools and Colleges (MSCHE), and the New England Association of Schools and Colleges (NEASC), recognize the importance of information literacy in their respective standards and expect these standards to be met (MSCHE, 2003, NEASC, 2005, WASC, 2001). To validate stated learning outcomes, universities must document to these accrediting agencies that their institution’s information literacy learning outcomes are being achieved. Information literacy has been recognized as a key component of students’ educational foundation by a number of other professional associations as well, including the American Association of School Librarians (AASL) and the Association for Educational Communications and Technology (AECT), [1998]; the International Society for Technology in Education (ISTE), [2000]; and the National Council for Accreditation of Teacher Education (NCATE), [2002]; and the Northwest Commission on Colleges and Universities (NWCCU) (O’Neil, 2005).

Academic and research librarians, in their work with faculty and students, underscore the complex world of information and its many formats—print, electronic, image, spatial, sound, visual, and numeric. The issue is not the lack of information; it is having too much information. Faculty, students, and staff have access to 17 million Internet sites, three billion Web pages, and more than one million print items in a typical
medium-sized academic library. Learners and teachers must be information literate as the ability to confidently navigate this maze of information is critical for academic and job success and personal self-directed learning (Rockman, et al., 2004).

Many institutions of higher education are transitioning to become learning communities where students and faculty take responsibility for learning in and outside of the classroom. This emphasis on active learning is supported by constructivist theorists who view learning as an active process that considers all aspects of experience as central to the learning process (Kuhlthau, 2004). Students are encouraged to move from passive learning, in which they receive information in the classroom, to becoming active, inquiry-based learners who assume responsibility for finding information to solve problems and who actively use this information in their academic and professional lives. Librarians and faculty must collaborate to integrate inquiry-based learning and information literacy (Breivik, 1998).

A seminal 1987 conference sponsored by Columbia University and the University of Colorado brought together provosts, deans, and university librarians to develop strategies that would result in graduates who were self-directed, independent learners. The conference concluded with a series of outcomes that provided the foundation for today’s information literacy efforts. Conference leaders recommended that students graduate from college with the ability to understand the process and systems for acquiring current and retrospective information, to evaluate the effectiveness and reliability of various information channels and sources to master certain skills in acquiring and storing their own information, and to articulate and be responsible citizens
in considering current and future public policy issues relating to information (Breivik, 1998; Eisenberg, Lowe, & Spitzer, 2004).

Two years later, the American Library Association (ALA) Presidential Commission on Information Literacy (1989) was established. The Commission’s report acknowledged the economic importance of an information literate citizenry and that producing such a citizenry would require educators at both the K-12 and college levels to integrate the concept of information literacy into their learning programs (Breivik, 1998). A direct result of the ALA Presidential Commission on Information Literacy was the establishment of the National Forum on Information Literacy comprised of over 65 professional and higher education associations committed to the concept of information literacy as a means of individual empowerment.

One of the key professional associations responsible for producing an information literate society is the American Association of School Librarians (AASL). According to AASL president, Roscello (2004), school library and media specialists’ roles in school systems date back to the mid-1900s. In 1945, the American Library Association published professional standards for school libraries recommending that the school library be considered an essential element in the school program. The distinctive purpose of the school library is to help children and young people to develop abilities and habits of using books and libraries in attaining their goals of living (Roscello, 2004). In the 1980s, The American Association of School Librarians developed Guidelines for School Library Media Programs that sought to ensure that K-12 students and staff would have the ability to use ideas and information effectively (Breivik, 1998). K-12 level schools should provide opportunities for students to interact with the school librarian/media
specialist to learn how to effectively navigate the vast array of information resources available. Teachers are encouraged to work with librarian/media specialists designers to ensure that student assignments are integrated with information literacy skills.

The National Forum for Information Literacy (NFIL) recognized the importance of the school librarian/media specialists in a 1992 report that described the library media center and school librarian as critical to the integration of information literacy into the curriculum. Ideally, the library/media center should be staffed by a trained school librarian/media specialist who works with classroom teachers to carry out teaching objectives. Many other professional groups and coalitions recognize the important role school librarian/media specialists have in integrating information literacy into K-12 education (Eisenberg, Lowe, & Spitzer, 2004).

The Partnership for 21st Century Skills, a public-private coalition, concluded that K-12 students need to know more than core subjects to be successful in meeting the information-centered demands of the 21st century (Salpeter, 2003). Elementary and secondary education students should know how to use their knowledge skills by thinking critically, transferring knowledge to new situations, and analyzing information to comprehend new ideas (Salpeter, 2003).

For many individuals, the most obvious place to find information is the library. Understanding how information is organized is important to a successful information search. It is also important to recognize that libraries are different and serve different purposes. Special libraries serve limited users, as in corporate settings. Public libraries are probably the most readily available to adults and meet the broad cultural and informational needs of the communities they serve. School libraries serve the needs of K-
12 and specialized students and reflect the curriculum of the school district. Finally, academic and research libraries provide scholarly collections to support the teaching, research, and service missions of their institutions (Whitson & Amstutz, 1997).

Academic and research librarians’ role in learning and teaching individuals to effectively use libraries has its historical roots in the late 19th century. John Shaw Billings, a leader in medical librarianship, noted the exponential rate of growth in the medical literature. In 1940, Fremont Rider, a librarian at Yale University, expressed concern about the exponential growth of information that would require an eight acre card catalog by the year 2040 to list all of the books at Yale. Rider’s report energized academic and research librarians to begin to explore ways of coping with the impact of the information explosion. By the early 1980s, the advances in information technology led to the development of a logarithmic scale which suggested that the computer technology/information explosion had replaced concerns about the initial print-based information explosion (Koenig, 1982). By the 1990s, academic and research libraries were providing information options that ranged from print resources to web-based electronic versions of journals and indexes to Internet-based search engines such as Yahoo and Google.

The information age has dramatically changed the way people live. Those who do not understand that the rules of information access and retrieval continue to change will find themselves unable to effectively manage the glut of information. The Internet is expanding with little or no systematic organization. Sites often direct the learner to non-existent or time limited links. Search strategies are often not provided to help the learner get to where he or she wants to go or convoluted instructions make it impossible to get
there. In March 2000, a company that evaluates Web sites based on visitors’ opinions designed a study that asked 800 people to search two popular job hunting sites and complete several tasks (Wurman, 2001). The participants were asked to find a specific job listing. Only 25% found the correct listing on one site and only 35% were successful on the other site. These types of experiences can lead to information anxiety defined by the ever-widening gap between what we understand and what we think we should understand. This difference in understanding is the gap that develops when information does not tell us what we need to know (Wurman, 2001).

As the twenty-first century approached, higher education administrators predicted that university level education would be more accessible through distance education, that lifelong learning and training would be a part of the infrastructure of schools and businesses, that computers would provide access to global resources, and that information access and use would be an integral aspect of lifelong learning (Cetron, 1994; Coates, 1994). Others predicted that lifelong learning would permit workers to obtain the exact knowledge and skills needed to solve problems and that information literacy would facilitate students’ ability to place specialized knowledge into much broader contexts (Whitson & Amstutz, 1997).

The information explosion has been directly connected to the rapid development of information technology and the information controllability explosion (Koenig, 1982). This explosion has resulted in a shift from an industrial age to a network and global information age. The production, acquisition, and distribution of knowledge are global phenomena. Many segments of the population, however, do not have equal access to the benefits of the information age resulting in a digital divide (Servon, 2000). The digital
divide defines the gap between those who have access to the latest information technologies and those who do not. In an age where information is power and content is very important, not having access to information is considered a handicap (Compaine, 2001). Attewell (2001) described the digital divide as a new social problem that has captured the attention of politicians and philanthropist in the United States. The author reported that poor and minority families are less likely than other families to have access to computers and the Internet.

Researchers in higher education have broadened the definition of the digital divide to reflect the disparities in access to information and technology across the variables of race, ethnicity, income, education, and gender (Mossberger, Tolbert, & Stansbury, 2003). Several factors are involved in these disparities, including access, skills, economic opportunity, and democracy.

The access divide refers to whether an individual has home access to a computer, Internet, and email and whether access is available outside of the home—at work, school, the library, or the home of a friend or relative. For example, the individual may not have access at home or school, but may have access at their public library branch. The skills divide refers to the individual’s level of technological and information literacy competence. For example, does the individual know how to find a specialist for a medical condition? Can the individual use word processing software to write a letter? The economic opportunity divide refers to the individual beliefs about computers and economic advancement (Mossberger, Tolbert, & Stansbury, 2003). The democratic divide measures the attitudes and experiences of individuals regarding the relationship of information technology to their political principles or actions. For example, researchers
have examined the attitudes and experiences of those who may or may not have used information technology for voter registration, casting a ballot, or looking up government or political information (Mossberger, Tolbert, & Stansbury, 2003).

In the United States, studies of the digital divide now focus more on the global picture and what is happening in third-world countries. Consequently, fewer U.S. resources, projects, and programs are addressing the digital divide (Carvin, 2006). Further, U.S. government spending to close the digital divide has decreased. For example, government funding for education technology grants to the states was expected to be cut from $279 million to zero for the 2008 fiscal year (Barzilai-Nahon, 2006).

Despite reports of the dissolving digital divide, some organizations continue to pursue solutions. For instance, the Intel Computer Clubhouse Network, created to introduce digital resources to young people, urges that black and Hispanic teenagers’ ability to send an instant message is not as important as their ability to find information on the Internet that will help them make important decisions in their daily lives (Marriott, 2006). Intel’s stance reinforces the belief in the power of information and technology to enhance daily life at home and at work.

Unfortunately, the lack of information is increasingly becoming a significant economic disadvantage. In many communities, student access to computers and information falls off dramatically as many students do not have a computer at home (Barzilai-Nahon, 2006). A report issued in September 2006 by the U.S. Department of Education indicates that only 37% of students from families with incomes below $30,000 dollars use computers at home compared to 88% of students whose family income is over $75,000.
The 2005 Pew Internet and American Life Project reported that 70% of whites went online on a regular basis compared to 57% of African Americans. Only 29% of individuals with less than a high school diploma had Internet access compared to 61% of high school graduates and 89% of college graduates (Salpeter, 2006). The National Center for Educational Statistics (NCES) research on computer and Internet use by children and adolescents reported that only 47% of 5-17 year olds whose families were in poverty had Internet access at home compared to 82% of 5-to-17 year olds whose families were not in poverty (NCES, 2003).

White and well-educated households are far more likely to have access to telephones, computers, and telecommunications than Native American, Latino, and African American households, or those with lower levels of education (Salpeter, 2006). Because income and education are highly correlated with Internet access at home, classroom access to the Internet is critical for students who attend urban and poorer schools (Mossberger, Tolbert, & Stansbury, 2003). In many cases, poor and minority students do not have access to technology in their homes, local libraries, or community centers. Schools may provide the only opportunity for them to develop the ability to effectively use computers and information resources and be adequately prepared for life in the twenty-first century. Strategies to reduce the digital divide must be explored and incorporated into the curricula of urban schools (Walker, 1997) and are important for many parents, educators, students, and their local communities (Laffey & Moore, 2002).

Hawkins and Oblinger (2006) reported that the digital divide goes beyond owning a computer. The researchers suggested that college and university administrators must define the digital divide in the context of machine vintage, connectivity, online skills,
autonomy and freedom of access, and computer use support. Differences in online skills are also an important factor. Online skills must include the ability to efficiently and effectively find information on the web. Many students arrive at college digitally illiterate which may be due to lack of technology access or training in the students’ elementary or secondary educational experiences (Hawkins & Oblinger, 2006).

The inclusion of students with disabilities in general education has led to the development of many software and hardware programs that are designed to provide the accommodations and modifications these students might need. However, people with learning and physical disabilities are less likely to have access to the Internet or use a computer than people without disabilities than at all income levels (Kalypanpur & Kirmani, 2005).

The No Child Left Behind Act of 2001 (NCLB) redefined the role of the federal government in helping to close the digital divide. One of the primary goals of this act was to improve student achievement through the use of technology and to ensure that every student be technologically literate by the end of eighth grade. However, this federal legislation did not prescribe instructional methods through which the effective integration of technology and curriculum can improve student achievement. One way to achieve this goal is the proactive collaboration between school librarians/media specialists and teachers to design instruction models that effectively integrate technology and information literacy (Loertscher & Woolls, 2002).

Unfortunately, many urban school districts do not have certified school librarians/media specialists. According to the 1999-2000 National Center for Educational Statistics (NCES) report published in 2004, 92% of all traditional public schools have
library/media centers, but only 52% of public high schools have a school librarian/media specialist with an MLS or related degree and 39% of public elementary schools, and 32% of public combined schools.

The school library media center is defined as an organized collection of printed and/or audiovisual and/or computer resources that is administered as a unit, is located in a designated place or places, and makes resources and services available to students, teachers, and administrators (NCES, 2004).

The NCES report also revealed that 63% of private schools have a school library/media center, but only 43% of private high schools employed a school librarian/media specialist with an MLS or related degree compared to 9% of private elementary schools and 26% of private combined schools. These percentages are dramatically lower for some states including California where only 10.7% of public schools with library media centers had paid state-certified staff with the MLS or related degree. In central or inner cities, only 38.4% of staff had the recommended credentials compared to 47% in the NCES urban/large town category. The rate for rural and small towns was 36%.

As a result, many of the learning activities that promote the acquisition of information literacy and information technology skills are now the responsibility of K-12 classroom teachers. How well prepared are K-12 teachers to assume this new role? Arthur Levine, the president of the Woodrow Wilson National Fellowship Foundation (WWNFL) has his doubts that they are well prepared. According to President Levine (2006), the United States is grappling with close to 200,000 teacher vacancies a year due to high attrition rates among new teachers and the retirement of baby boomer teachers. In
addition, student numbers are increasing as a result of immigration, population redistribution, and regional growth. At the same time, teacher education programs must re-tool to prepare today’s teachers to know and do things their predecessors did not need to know or do. Today’s teachers must be prepared to educate all of their students to achieve in an environment where the focus is on learning the skills and knowledge students must have to compete successfully in an information-based economy.

Current teacher education programs are mostly unprepared to equip teacher education students with information and technological demands (Levine, 2006). In an information-based society, teacher education programs must provide teacher education students with information literacy to assist their preparation of curricula that emphasizes student life-long learning. Recent studies (Asselin & Lee, 2002; Nero, 1999; Sheehy, 2001) have found that classroom teacher information literacy competencies were deficient. One effort, reported by Crouse and Kasbohm (2004), to improve the information literacy of teacher education students used a model developed at Niagara University in which the acquisition of information literacy proficiency was emphasized through the collaborative work between teacher education faculty and librarians. Information literacy instruction modules provided plans for teacher education faculty members and librarians to teach information literacy to the teacher education students. The teacher education students received information literacy training as a part of their first-year experience course, the first course in their major, in an upperclassmen research methods course in their major and as a component of their graduate level courses. The students learned information literacy and a process which facilitated the replication of their training into their teaching. The information literacy training served as a
pedagogical model for teacher education with particular attention given to the research syllabus, assignment content, teaching methods and assessment (Crouse & Kasbohm, 2004).

According to Crouse and Kasbohm, the researchers concluded that information literacy can no longer be considered a tertiary educational skill. Teacher education students must consider the development of information literacy competence as one of the major goals of their education. When teacher education candidates are educated to believe in the value of teacher and librarian cooperation, they may be more likely to collaborate with school librarians to include information literacy skill building assignments into curricula.

A 1993 study conducted in Canada investigated how teacher education programs integrated school libraries to support the development of information literacy in teacher education. The study included methods instructions, practicum coordinators, and librarians from a stratified random sample of 17 teacher education programs in Canada. The researchers found that teacher education students were not introduced to the role of the school library and had little or no opportunity in their practice teaching to use school libraries. Information literacy pedagogy was not explicitly developed and there was little or no expectation from teacher education faculty that teacher education students would assume this responsibility in their classrooms (Asselin & Doiron, 2003).

Collier, Rivera, and Weinburgh (2004) assessed how well teacher educators (n=43) were preparing pre-service preschool/elementary teacher education students to meet the current International Society for Technology in Education Standards (ISTE, 2000). The study asked key questions about what skills university faculty believed should be
taught during the terms prior to student teaching and how teacher education students’
technology skills changed between the beginning of the program and the term before
student teaching. The researchers found that teacher education programs can prepare
teachers to acquire, select, and use instructional technologies effectively. However,
results also indicated weaker skills in the area of information literacy. Only 4.4% prior to
student teaching indicated a likeliness to seek information when it was in electronic form
and only 2.3% were likely to do so after student teaching. This could be a result of the
student’s direction from in-service teachers as suggested in Sheehy’s (2001) that explored
information literacy training in a student teacher mentoring program.

The current study assessed the information literacy knowledge of graduate teacher
education general education and special education credential students in northern
California who represented diversity in age and number of years in the classroom. Some
graduate teacher education students came from backgrounds where they received little
exposure to information literacy in their training and may find it difficult to integrate
information literacy into their classroom teaching. Some graduate teacher education
credential candidates worked in school systems where students had little or no exposure
to information literacy. Many of these school systems did not employ school
librarian/media specialists.

According to the 2005 National Center for Educational Statistics 13.7% of public
school enrollment in the United States and 10.5% in California are students requiring the
expertise of special education teachers. The number of special education students
enrolled in public schools may present challenges to special education teachers and
school librarian/media specialists for obtaining information literacy. Special education
students present special learning needs that will need to be considered when presenting information literacy proficiencies. In poorer and urban school districts, without school librarian/media specialists, it may be the responsibility of special education teachers to teach information literacy to their students. In order to explore this digital divide challenge, the information literacy proficiency of special education and general education teacher candidates will be examined.

The study examined graduate special and teacher education credential student’s previous training in information literacy, their knowledge of information literacy, and their perceived readiness to integrate this knowledge into their classroom teaching. Many of these graduate special and teacher education students are taught in, or plan to teach in, high poverty urban schools that are facing digital divide issues and these graduate teacher education students will be responsible for imparting these essential skills to their students.

Theoretical Rationale

The Association of College and Research Libraries’ (ACRL) Information Competency Standards for Higher Education (2000), American Association of School Librarians’ (AASL) and the Association of Educational Communications (AECT) and Technology’s Information Literacy Standards for Student Learning (1998), and Eisenberg and Berkowitz’s Big Six Information Problem Solving Model (1996) provided the conceptual framework for this study. The three frameworks provided a reference for identifying the information literate individual and performance indicators that assessed the level of information literacy attainment. The ACRL and AASL/AECT standards and the Big Six Model Approach to Information Problem-Solving provided the basis for
measuring the information literacy of graduate teacher education students in this study. Specifically, the instruments used in this study, the *Beile Test of Information Literacy for Education* (B-TILED) and the researcher designed *Readiness to Integrate the Knowledge of Information Literacy into Teaching Survey*, are based on both Standards and the Big Six.

The ACRL (2000) and the AASL/AECT (1998) standards provide an intellectual framework for understanding, finding, evaluating and using information. Both sets of standards allow many opportunities for students to use a wide variety of information resources to expand their knowledge, ask informed questions, and sharpen their critical thinking skills for self-directed learning. In order for students to achieve competency in information literacy, they must understand that information literacy competencies are an integrated part of curriculum content, structure, and sequence. Information literacy does not stand alone.

The AASL/AECT standards equip the school librarian/media specialist with the conceptual framework and guidelines for describing the information literate student in K-12 classrooms. The standards consist of three categories, nine standards, and 29 indicators (e.g. the information literate student determines the nature and extent of information needed). The core learning outcomes that directly relate to the services provided by school librarian/media specialists are found in three standards and 13 indicators that define information literacy. There are three core standards. The student who is information literate accesses information efficiently and effectively, evaluates information critically and competently, and uses information accurately and creatively.
The ACRL Standards (2000) provides a continuum of information literacy indicators that define information literacy competencies for higher education. For the current study, the two sets of standards provide a context for establishing information literacy indicators in terms of what graduate teacher education students need to know, understand, and do in their classrooms. In urban and poorer schools, the graduate teacher education students may be required to teach education information literacy to their students who face digital divide issues.

Several studies have examined the ACRL and AASL/AECT information literacy standards’ integration into students’ educational experience (Dennis, 2001; Dunn, 2002, Elmborg, 2006; Flaspohler, 2003; Farmer, 2001; Gedeon, O’Connor, & Radcliff, 2002; Mahaffy, 2006; Seamans, 2001, 2002). The current study, based on the ACRL and AASL/AECT standards examined the knowledge of information literacy of graduate teacher education students.

The Big Six Model represents a general approach to information problem solving through six logical steps. As a model, the Big Six shares major elements with the AASL and AECT Standards for Information Literacy and the ACRL Information Literacy Standards for Higher Education. Each step of the Big Six is interconnected and necessary for the successful resolution of an information problem (Eisenberg & Berkowitz, 1996). Information problem solving starts with: (1) Task Definition, a precise understanding of the problem that needs resolution. Students must determine the range and aspects of the tasks to be accomplished, ask the questions that need to be answered, and find the information they need to solve the problem. Once the student has clearly defined the problem, (2) Information Seeking Strategies help the student to identify the
range of resources that are available to solve the defined task. (3) Location and Access represent the implementation phase of the information seeking strategy. At this stage, a key Big Six Model process is to help the student go beyond finding and using a particular resource to understanding how these skills can be transferred to other information seeking situations (Eisenberg & Berkowitz, 1996). Stage four, Use of Information, articulates the set of skills a student applies to a single information source. The student must be able to interact with the information, apply it to a specific situation and take notes, copy the information, or appropriately cite it. Stage five, Synthesis, synthesizes the information found and applies it to the defined task. The information is restructured into different formats to meet the requirements of the task as defined. The final stage (6), Evaluation, is defined as the examination and assessment of the information problem-solving process to determine how effectively and efficiently the task was completed.

A number of researchers and authors have explored the efficacy of integrating the Big Six Model (see Figure 1) into curricula in K-16 settings (Cottrell & Eisenberg, 2001; Murray, 2003; Schrader, 2003; Wolf, 2003). Wolf (2003) explored the Big Six model as a metacognitive scaffold. Metacognition is the knowledge of self, the task at hand, and the strategies to be employed to complete the task. These factors are thought to affect learning (Lerner, 2007; Tuinaannevirta, 2006). Scaffolds are the support structure for learners engaged in activities immediately beyond their present abilities. The Big Six as an information problem solving model, is positively linked to metacognitive skills as a learning scaffold. The study confirmed Eisenberg and Berkowitz’s (1996) contention that the Big Six provides skills that students can use in a variety of learning situations. The
results presented support for the Big Six recommendation that students can succeed at complex, learner-centered, research oriented tasks (Wolf, 2003).

According to O’Neil (2005) information literacy as a concept came into existence close to thirty years ago. The use of the term and what it represents has dramatically expanded and now can be conceived as a construct that attempts to explain the relationship between efficient, effective, and ethical use of information combined with a critical understanding of how information is produced, distributed, and organized and its relationship to the information seeking process.

Finally, according to Kuhlthau (2004) information seeking is a primary activity of life and encourages individuals to seek information to enrich and broaden their understanding of the world around them. Information seeking in libraries is placed in a larger context of learning and has its context in constructivist theory as outlined by Dewey (1933), Kelly (1963), and Bruner (1975), that views learning as an active engaging process in which all aspects of experience are integrated.
Figure 1

Eisenberg and Berkowitz’s Big Six Skills Model

Ideally, the Big Six Model is used collaboratively between school librarian/media specialists and teachers to make the most of library resources and student research time (Thomas, 2004). However, it also provides a relatively simple framework for classroom teachers to assess teach and assess the information literacy knowledge of their students. For the purposes of this study, the Big Six Model and the ACRL, AASL/AECT Standards provided a framework to assess the knowledge of information literacy of graduate teacher education students in credential programs.

Significance of the Study

This study was important for several reasons. The twenty-first century is characterized as the age of information. In order for individuals to be successful in an increasingly global economy, they must be able to successfully navigate the exponential growth of information. Information literacy knowledge should be acquired at an early age to ensure lifelong learning and success. Helping K-12 students make sense of information and information-seeking has been the unique task of school librarian/media
specialists. However, while societies like to describe themselves as information rich, there are still many communities and individuals who are still information and technology poor (Thomas, 2004). Many cultural and economic factors appear to influence students’ access to computers and the Internet. The gap between computer and Internet use at home and school is greater than 30% for less affluent students who are Black or Hispanic; live with parents who did not complete high school; live with a single mother; or live in a household where adults only speak Spanish. Access to technology-based learning activities (communication, resource-sharing, and information-seeking) at home is still impacted by social factors beyond the control of K-12 students. Race, economics, and family dyad are components of the digital divide. Educators are urged to work steadfastly toward open, equitable access to the Internet and technology for all students in all schools (Bronack, 2006). In this context, many special and general education teachers will be working in poorer and urban schools without school librarians/media specialists or school library/media centers. In many cases, their students will not have access to computers at home. This study underscored the importance of integrating information literacy competencies into the curricula of graduate teacher education credential special and general education programs.

This study examined whether graduate teacher education credential special and general education students were able to assume the responsibility of teaching information literacy to their students in schools that did not employ certified school librarian/media specialists. This study also examined their previous training in information literacy and whether their readiness to integrate information literacy into their teaching. As a result, this study may provide direction for the integration of information literacy competencies
into the curricula of graduate teacher education credential special and general education programs. This study also contributed to the information literacy assessment knowledge base and will be of interest to information literacy instructional programs, university administrators, and, with the increased focus on assessment in higher education, individuals responsible for curriculum program review. This study continued the ongoing process of validating the *Beile Test of Information Literacy for Education* (O’Neil, 2005) instrument to assess information literacy knowledge of students enrolled in schools of education. Finally, this study supported the argument that graduate teacher education students who taught or may teach in urban or poorer school systems will need to be competent in information literacy and be prepared to integrate information literacy into instruction as additional resource for reducing the digital divide among lower socioeconomic public school students.

**Research Questions**

This study addresses eight research questions:

1. Do graduate general education and special education students differ in their knowledge of information literacy?
2. Do graduate general education and special education students differ in their readiness to integrate information literacy into instruction?
3. Do graduate teacher education students who have training in the knowledge of information literacy differ in their knowledge of information literacy from those without training?
4. Do graduate teacher education students who have training in the knowledge of information literacy differ in their readiness to integrate information literacy knowledge into instruction from those without training?

5. Do graduate teacher education students who teach in low socioeconomic schools differ in their knowledge of information literacy compared to those who teach in higher socioeconomic schools?

6. Do graduate teacher education students who teach in low socioeconomic schools differ in their readiness to integrate information literacy into instruction compared to those who teach in higher socioeconomic schools?

7. Do students who self-rate their information literacy ability to search databases as high score higher on the Beile compared to those who rate themselves as low?

8. Do students who self-rate their information literacy ability to search the Internet as high score higher on the Beile Test of Information Literacy for Education compared to those who rate themselves as low?

Definition of Terms

*Academic or Research Librarian*- In this study, an academic or research librarian works for a college or university.

*Access Divide*- In this study, the access divide defined whether an individual has home or other access to a computer, Internet, and email.

*Digital Divide*- In this study, the digital divide is defined as the perceived gap between those who have access to the latest information technologies and those who do not.
Democratic Divide- In this study, the democratic divide defined the extent to which an individual uses technology to participate in or find information about the political process.

Economic Opportunity Divide- In this study, the economic opportunity divide defined individual beliefs about access to computers and economic advancement.

Information Literacy- Information literacy is the set of knowledge needed to find, retrieve, analyze and use information. In this study, information literacy was measured by the student’s performance on the Beile Test of Information Literacy for Education (B-TILED).

Information Age- In this study, the information age is defined as the period beginning around 1970 and noted for abundant publication, consumption, and manipulation of information, especially by computers and computer networks.

Masters in Library Sciences- In this study, the Masters in Library Science was defined as the first professional American Library Association accredited degree in library and information studies.

Graduate Level Teacher Education Credential Candidates- In this study, graduate level teacher preparation candidates was defined as teacher education students pursuing masters-level graduation education in single subject, multiple subject, or level education specialty and state certification.

School Librarian/Media Specialist- In this study, school librarian/media specialist was defined as a librarian with masters in library science or related degree who works in K-12 education.
CHAPTER II
REVIEW OF THE LITERATURE

Introduction

The modern library instruction and information literacy movement in academic and research libraries has its roots in the 1960s. However, library bibliographic instruction has a longer history. In the 1840s, Ralph Waldo Emerson urged colleges to appoint a professor of books. Emerson felt no other faculty position was as desperately needed (Tucker, 1980). At the first American Library Association conference in 1876, Melville Dewey addressed the importance of the library’s role in teaching. Dewey stated, “The library is a school and the librarian is in the highest sense a teacher” (Grassian & Kaplowitz 2001, p.14). Early courses or bibliographic instruction lectures were developed, at the time, by a number of librarian leaders including Raymond Davis at the University of Michigan, Azariah Smith Root, Oberlin College, George T. Little, Bowdoin College, and C.F. Lowrey, University of Colorado. In the 1920s and 30s expectations about the academic library’s role in teaching were lower than in earlier years, perhaps related to the general malaise facing higher education as a result of economic scarcity between the world wars and a social pattern some educators felt was hostile to the entire curriculum found in many institutions of the day. In some cases, the incoming freshmen statistics were indicative of modern times; only 47% of incoming freshmen at the University of Maine reported having used the card catalog, a periodical index, or the Dewey classification system (Tucker, 1980).

In 1983, the Commission on Excellence in Education published A Nation at Risk which outlined the lack of rigor in American school systems. While libraries were not
specifically mentioned in the Commission on Excellence report, the National Commission on Library and Information Science stated the important role of libraries and information resources in supporting all learning and aspects of information literacy including the ability to present information in a clear and efficient manner (Eisenberg, Lowe, & Spitzer, 2004).

In 1989, President George H.W. Bush and the nation’s governors held an Education Summit to examine the state of education in the country’s public schools. Six major goals were developed and the governors agreed to achieve the goals by restructuring and rethinking education in their respective states. In May 1991, President Bush delivered the America Excellence in Education Act to Congress. The proposed bill presented a number of goals including a focus on teacher education training to foster leadership and instructional skills. While the bill did not pass, Congress established the National Council on Education Standards and Testing (NCEST) that suggested states establish a voluntary effort to establish classroom and assessment standards (Eisenberg, Lowe, & Spitzer, 2004).

The Clinton Administration signed into law the Goals 2000: Educate America Act in early 1994. One of the major goals outlined in the law focused on teacher education and sought to insure by the year 2000 the nation’s teachers would have access to continued professional development and would acquire knowledge and skills needed to instruct and prepare students for the next century. Following passage of the Educate America Act, a number of organizations with responsibility for overseeing curriculum standards revised them to include guidelines or suggestions for incorporating information literacy (Eisenberg, Lowe, & Spitzer, 2004).
In a speech delivered to the Internet/Online Summit: Focus on Children (1997), Vice President Albert Gore stated “the Internet is not a luxury or a diversion; it is an essential tool for children. And its use is fast becoming an essential skill for adults. That is why we’re committed to connecting every classroom and school library to the Internet by the year 2000.” Research has indicated that this did not happen, and the impact of the digital divide has been especially acute among the rural and urban poor (Mossberger, Tolbert, & Stansbury, 2003; Carvin, 2006; Barzilai-Nahon, 2006).

The No Child Left Behind Act of 2001 (NCLB) promised to reform education and help to close the digital divide. However, after four years of complaints from parents, teachers and administrators about NCLB, a bipartisan commission is being formed to take a close and independent look at the law’s problems and its promise. According to the National Education Association (2006), lawmakers need to approve adequate funding and the law must be fundamentally improved. Congress has to reauthorize the legislation in 2007 which provides an opportunity to make the legislation more workable and responsive to the real needs of children.

The above introduction provides a brief overview of key factors influencing this study. The digital divide, information literacy, and teacher education have considerable impact on the formal education provided to children in elementary, secondary, and higher education and can influence their ability to successfully compete in an increasingly knowledge-based society. This chapter reviews the related literature and empirical studies in three areas: a) digital divide and its impact on information literacy, b) information literacy in higher and K-12 education, and c) teacher education and information literacy.
Instruction in the knowledge of information literacy is one of many core services that libraries have traditionally offered users. In the digital age, defining the limits of library resources has become a daunting task. The instructional needs of users have changed as new methods for teaching and learning have impacted education. In addition, common factors such as technology, collaboration, and the intellectual diversity of interdisciplinary programs have influenced institutions to give greater priority to the education of their students and to rethink the fundamentals of the student experience. As a result, academic and research librarians have considered how these changing values and priorities impact information literacy knowledge instruction. While information sources and methods for finding information are still major components, a broader framework that provides a repertoire of essential skills that supports information inquiry in the digital age is an important new dimension (Freeman, Bennett, & Demas, 2005). In order for every student to have the opportunity to develop basic technology and information literacy competence, the inequities in access to technology must be addressed (Morse, 2004). The use of computer technology to develop basic skills has been defined as the skills and drills approach in which the rote memorization of facts, figures, and formulas are asked to be reproduced as a part of the assessment of the student’s learning. When students use computer technology to help develop higher-order thinking skills, they learn facts, figures, and formulas (Morse, 2004). As information literacy and computer skills are developed, the students move beyond rote memorization and begin to build connections by problem solving and generating new knowledge to examine large conceptual issues (Morse, 2004).
In a recent qualitative study, Tally (2006) observed children’s computing in 10 low and 10 middle income homes over a period of 12 months in two suburban northeastern communities and also conducted interviews. The researcher looked at differences in the ways youngsters in working class families use their home computers, the computer-related skills they exhibit, and the family support available to them as they use technology. From both communities, the researcher sought a racially-diverse sample that included households with seventh or eighth-grade students, a range of educational achievement levels and access to at least one Internet-connected computer in their home. The study found that middle class children are learning to use digital tools in individual, instrumental, and expressive ways that can serve them in the technology-centered workplaces. However, working class and poor children, even when they have access to computers and the Internet at home, are not learning to use digital tools in the same way as their middle class counterparts. Working class children used the computer for practical or informational tasks or to escape from their dire household circumstances. Middle class children practiced being ‘symbolic analyst’. Working class children practiced, at best, being administrative assistants. One reason suggested by Tally is that working class parents and children need more than access, they need training. Working class parents and children may need to be taught the practical uses of the computer and the computer’s key functions.

For example, in an area related to this present study, Tally (2006) explored the level of the students’ Web literacy which included the ability to find relevant resources in the often unorganized information found on the Web. This literacy included using search engines, browsing indexes, and the ability to interpret and evaluate the results of the
search with some degree of accuracy. The author found that the working class and poor children made less use of the Web and that their ability to perform Web literacy tasks was less than the ability of the middle-income students.

In another study, Minskey (2005) wanted to determine if there was a relationship between individual eighth-grade students’ technology proficiency scores and the students’ end-of-grade scale score in reading and math in six middle schools and to determine if socio-economic status, ethnicity, gender, and access to computers were important factors in that relationship. The computer proficiency score was defined by the North Carolina Test of Computer Skills. The participants in this study included male and female students located in a coastal county of North Carolina. The participants came from six separate middle schools in a district of 1,452 students. The data for the study were obtained from five survey instruments, and the surveys were given to each student taking the North Carolina Test of Computer Skills (NCTCS) and the North Carolina End-of-Grade Exams (EOG).

Minskey (2005) found that ethnicity, socio-economic status, and access to computers were indicators of academic success on the NCTCS. The research also indicated that a digital divide existed in the six middle schools included in the study and that this divide was related to the socio-economic status, ethnicity, and the level of computer access the students experienced. The researcher recommended that school leaders need to address the digital divide and the growing need for technology skills that help students find information and develop job related skills, online communication skills, and the ability to incorporate technology in everyday activities. Students need sufficient technology and information literacy proficiency in order to use search engines
via the Internet to obtain information for personal knowledge and school-related research (Minskey, 2005). While Minskey did not explore the role of teachers in decreasing the digital divide, the present study underscored the role teachers need to play in developing low socio-economic students’ knowledge of information literacy.

In a study that used both quantitative and qualitative methodologies, Robinson (2005) investigated student access and use of technology and the role schools can play in bridging the digital divide. The author used a purposive sampling methodology in which there is a potential risk of bias but which is a procedure often used in field research. Data were collected from a 24-question survey of 351 diverse groups of students, four student interview sessions conducted with forty students, and interviews with parents and staff. Twenty classroom observations of students using computers were completed. The technology-rich school is a Title 1 school (dedicated to decreasing the academic disadvantages of poor and minority students) located in the nation’s fifth largest district and has over 13,000 teachers and 250,000 students. More than 88% of the students are minority and disadvantaged.

Robinson found that this technologically-rich school substantially reduced the digital divide among its student population. Students at the school had direct access to computers and the Internet. The level of access was far above the national average where the literature indicated there is one computer for every 10 students in public schools. Robinson reported that this technology-rich school had a ration of 1:1 computer to every student. Technology was integrated into all aspects of school activities. All classes were scheduled for computer lab time. The research suggests that schools with strong resources and support can dramatically reduce the digital divide and increase the
technological and information literacy of teachers and students by providing technology-rich experiences in the classroom, library/media center, and lab. However, it is an uneven playing field for low socio-economic students and their families who do not have access to technology and the Internet, and as a result do not have the basic computer and information literacy to succeed in a technology intensive society.

According to Oblinger and Hawkins (2006), defining the digital divide in terms of the have and the have-nots does not present the entire picture. The researchers recommended that colleges and universities explore the second-level divide, which examines the age of the computer, online or information literacy proficiency, autonomy and freedom of access, and technology support. Connectivity could be an issue as well. The researchers reported that at the end of 2005 only 24% of rural Americans and only 39% of urban and suburban residents had broadband access as opposed to dial-up.

Finally, in an important consideration for this study, Oblinger and Hawkins (2006) pointed out that the ability to efficiently and effectively find information on the Web constituted another factor in the digital divide. The researchers concluded that the digital divide still exists.

*Information Literacy in Higher and K-12 Education*

As the twenty-first century unfolds, academic librarians have identified the continued need to promote basic information literacy. This need is even more critical with the explosion of the Internet and other forms of information sharing. The importance of information literacy is shared by other education professionals and accrediting organizations around the United States, and this increased emphasis on information
literacy has provided opportunities and new challenges for academic librarians (Johnson, Carswell, & Palmer, 2005).

Singh (2005) assessed faculty perceptions of the information literacy of students enrolled in accredited journalism and mass communication programs (JMC). The researcher also investigated the rate and impact of library instruction in JMC curricula and asked how frequently faculty teaching students in JMC programs gave assignments requiring library research, how frequently faculty teaching students integrate library instruction into their courses, what faculty reported the impact library instruction had on the research skills of JMC students, and how faculty of students in these programs perceived their students’ information literacy competence as defined by the ACRL Standards (ACRL, 2000). The author mailed 1,908 surveys in the spring of 2002 to full-time faculty teaching in accredited JMC programs; 425 (22.3%) usable surveys were returned. While Singh (2005) only reported responses to 16 questions, the participants answered 26 of the Likert-type and open-ended questions. The researcher pointed out that the validity of inferences made about the information literacy competency of undergraduates and their research skills was impacted by the fact that faculty participating in the survey were not asked to indicate what level of the undergraduate program the students were in. Singh also assumed that the level of the undergraduate student would impact his or her research abilities. She controlled for the confounding of some participants who taught more technical courses and therefore perhaps required library instruction or research as a regular part of their courses, giving them the option to respond “cannot judge” or “N/A” to questions which were then excluded. The author felt that external validity for this study was strong, as the results could be generalized to other
faculty teaching undergraduates at all levels and graduate students in JMC programs that were not accredited by the Accrediting Council on Education in Journalism and Mass Communications (ACEJMC).

The results of the study indicated that of the 97% of faculty required library research for their courses and 33.3% made library research a regular part of every class they taught. Of the 96% who answered the question, 2.4% reported that none of their classes had assignments that required library research. Only 8.6% of the respondents made library instruction a regular part of any course they taught, and nearly 29% indicated that library instruction was not a regular part of any course they taught. When the questions were posed to faculty teaching graduate students, a higher percentage of faculty reported making assignments requiring library research a regular part of their courses. Only 1.7% of the respondents reported that library research assignments were not a regular part of their courses. Close to 15% responded that they made library instruction a regular part of their courses. Only four faculty out of 416 (.9%) teaching undergraduates felt their students met all of the ACRL standards for being information literate and that they had excellent research skills. Only 13 faculty out of 358 faculty (3.6%) teaching graduate students described their students the same in way.

Singh’s (2005) results provided more questions than conclusions. The overall results of her study indicated that JMC faculty who gave assignments that required library research as a regular part of their courses, understood that library instruction improved student research skills, and described their students as needing improvement in their knowledge of information literacy and research skills, and understood that their library is structured to provide information literacy instruction. Why then was library
instruction not integrated consistently and deliberately into JMC courses at a greater rate? Unfortunately, the researcher did not offer suggestions for future research that might answer this very important question. While the present study will did not seek to answer Singh’s question, it will examine the knowledge of information literacy of students in another discipline (education) which may have implications for teacher education faculty and the integration of information literacy into their pedagogy for teacher education students.

In another study, Kimsey and Cameron (2004) assessed the teaching and inclusion of information literacy in a geography program at an east coast university. The researchers felt that geography students must have the skills to access, evaluate, and utilize information needed in their undergraduate experience and in their future learning experiences. Specifically, students planning on pursuing a graduate degree in geography would need skills appropriate for graduate level research papers, theses, and dissertations. Students entering the workplace after earning their undergraduate degree would need the skills to conduct research in the workplace. The researchers’ institution provided a two-tiered program to help students acquire knowledge of information literacy. As freshmen, the students were introduced to information literacy as a part of the general education curriculum and completed eight web-based learning modules with online exercises. Students had to demonstrate their proficiency by passing the test or they could not register for additional courses at the university.

Using the ACRL Information Literacy Competency Standards for Higher Education, the authors developed a list of five learning objectives for information literacy for geography majors that served as the focal point for instruction and assessment. The
learning objectives were (1) to identify the function of the types of specialized reference sources and know how to use them, (2) to interpret bibliographic information in citations and records, (3) to search an electronic database effectively, (4) to find reliable information on the Internet, and (5) to evaluate information in any format in terms of authority, supporting documentation, purpose, and presence of the review process.

The researchers developed a 48-item test that measured the specific sources, skills and search strategies geography majors should know. The test had five content sub-scores for basic reference, database searching, and evaluation of sources, information ethics, and Internet use. The librarian liaison and a geography faculty member determined the standard for passing the test and arrived at a level of difficulty for all 48 items: 19 items were easy, 22 were moderate, and 7 items were considered difficult. They also decided that students would need to respond correctly to all of the easy and most of the moderate questions (at least 36 items) to pass at a basic level and would need to answer correctly all of the easy and moderate questions (at least 41 items) to pass at the advanced level. The test was initially administered to 28 senior geography majors on the institution’s university-wide assessment day. The test was administered the following year (with minor modifications that the researchers did not specify) to 22 senior Geography majors and the next year to 29 senior majors. To determine reliability, the researchers combined the first two years. The Cronbach coefficient alpha was .74.

The researchers found that, in year one, 75% of the students passed the test at the standard level, and 46% passed at the advanced level. In the second year, 82% passed at the basic level, and 50% passed at the advanced level. In the final year, 93% passed at the basic level, and 59% passed at the advanced level. Unfortunately, the researchers did not
discuss reasons for the changes in student scores, but they did ask the students to rate their level confidence in using library resources, finding information on the Internet, and what portion of their geography courses required them to find information in the library or on the Internet. In year one, 78% of the students felt confident in using library resources; in year two that figure was 69%. In year three, 83% expressed confidence in using library resources. Ninety-six percent of the students felt confident to find information on the Internet in 2002, 91% in 2003; and the percentage rose to 96% in 2004. In 2002, 57% of the students felt that half or more of their geography course required them to find information in the library on or the Internet. Fifty-five percent reported the same in 2003 and 75% in 2004. While the data indicated that information literacy could successfully be integrated into a geography major, additional strategies may be required to improve the information literacy of geography majors.

Results of the Information Literacy Test in Geography were included in a program review report for geography and were favorably reviewed by the university administration and the outside academic program review committee. The researchers concluded that collaboration between geography faculty and the librarian facilitated successful integration of information literacy into the curriculum. The librarian developed appropriate materials and learning activities and the faculty developed the assignments that required students to find and evaluate information. Finally, the researchers concluded that it was crucial that geography faculty make a decision that critical information literacy proficiencies are integrated in geography coursework.

Maughan (2001) conducted a study at a major research university in northern California assessed the information literacy among undergraduates. In the spring of 1994,
the Teaching Library (bridged the gap between the classroom and the library’s
information resources) at the university developed a 36-item multiple choice survey that
had been piloted on selected groups of undergraduates. The first three questions were
designed to assess the participants’ mastery of basic research skills and their knowledge
of the university library system. A revised version of the survey was mailed in the spring
of 1994 to graduating seniors in the political science and sociology departments. A
second survey was mailed in the spring of 1995 to graduating seniors in history, history
of art, and philosophy departments. The survey was mailed for the third time in the spring
of 1999 to graduating seniors in history, political science, and sociology. The return rates
for the surveys varied over the years and among the seniors who participated. In 1994,
71% of the political science seniors returned the survey and only 56% of the sociology
seniors responded. The 1995 survey had the following return rates: history seniors, 61%;
history of art seniors, 50%; and philosophy seniors, 42%. In 1999, 32% of the history and
political science seniors returned the survey; 39% of the sociology seniors returned the
survey. Five basic library skills were identified by the researcher in order to compare the
results: the ability to read a call number correctly, the ability to identify subject headings
in a library catalog record, the ability to identify a reference to a book, the ability to
identify references to journal articles, and the ability to interpret location information in a
library catalog record.

The key results of the survey did not correspond to the seniors’ perceived
competence in information literacy. In the 1994 survey of political science seniors, 78%
could not identify the best source in the library for locating congressional publications;
66% did not know a key index for political science, *Public Affairs Information Service*;
and 60% were unable to identify the purpose of the *Statistical Abstract of the United States*. In the 1995 survey, 89% of history seniors could not identify the index *America: History and Life*, 56% could not identify *Current Contents* and 47% could not tell the purpose of *Readers’ Guide to Periodical Literature*. The history of art seniors did not fare any better. Among the 1999 sociology seniors, 69% could not identify the purpose of Sociofile, a key electronic database for sociology-based research. All of the seniors had trouble using the card catalog, locating a book in the card catalog, interpreting bibliographic citations, and limiting search results.

Maughan (2001) concluded that students thought they knew more about conducting library research than they were able to demonstrate. Students were confused by the elementary conventions for locating and organizing information. The author also surmised that there were many possible reasons for this including the fact that the state of California ranked close to the bottom nationally for funding of school libraries and the fact the entire state had only 850 school librarians. While the national ratio of school librarian/media specialists was 1:882, California’s ratio was 1:5342. The researcher suggested that this may be one reason why students arrived at the university without knowledge of information literacy, recommended that more systematic and widespread assessment of information literacy be conducted, and that the results of these assessments should be shared from institution to institution. The current study hoped to contribute to the ongoing need for the assessment of the knowledge of information literacy proficiency.

As high school students graduate and begin to use college libraries, academic librarians find that some students are better prepared than others for the research
assignments given in class. Information literacy proficiencies form the structure for a
core set of competencies that are necessary for success in the academy and in the work
world. Ideally, students should arrive at college with the information literacy necessary to
navigate college level research tasks. Although students may have had some exposure to
information literacy in elementary and secondary school, additional training in
information literacy is often necessary.

In this context, Smalley (2004) examined the levels of student achievement in an
information literacy class offered by a community college library serving a diverse
population in central California. The researcher asked “Do students from high schools in
the one district that has school library/media specialists do better in information literacy
skills course when compared to students from high schools that do not have librarians?”
The researcher examined class rosters for the information literacy skills course for spring
2001 thorough spring 2003 and decided to limit the study to 506 student participants who
took the course in a semester-length format. Additional selection criteria included
participants who came from regular non-alternative public high schools, participants who
had received a grade in the course, and participants who had attended high school for four
consecutive years (1996-2000).

Results suggested that 66% of the students from the school district with librarians
earned an A in the course as a whole. Respectively, only 43% and 37% of the students
who came from districts without a school librarian earned an A. While a number of other
variables may have influenced the results of this study, Smalley (2004) concluded that
students from high schools with school librarian/media/specialists were more familiar
with basic library concepts, fundamental ideas about how information is organized and
made accessible, and how to use electronic resources than were the students from high schools with out librarian/media specialists. It was recommended that information literacy strategies need to be a part of the entire educational experience and that school librarian/media specialists and information literacy training are fundamental to K-12 education.

While most studies that examine information literacy have been conducted by librarians, a recent case study conducted by two professors of psychology explored the development of information literacy in an introductory psychology course at private university in Ohio (Larkin & Pines, 2005). The authors considered that the eagerness with which students initially come to the study of psychology is displaced when they need to learn research methods. Concepts such as “operational definition”, “literature search” and “journal article” frequently produce confused looks and the mention of library instruction is unenthusiastically received. In order to encourage student interest in empirical research and underscore the need for information literacy, the researchers designed a data-collection project to teach research methods and develop information literacy competence. The project gave students an interesting and personally-engaging question, provided the students with hands on learning-by-doing approach, and used a minimal amount of class instruction time. With the help of academic librarians who used the ACRL Information Literacy Standards as a guide, they established an external evaluation to assess the student’s information literacy at the conclusion of the project. The research project question was “Do girls prefer bad boys?” The search for the answer to this question provided the process for teaching research methods and introduced the
students to academic databases. The project was divided into two phases: conducting original research study and completing an online literature search.

Larkin and Pines (2005) selected 130 undergraduates (49 men, 81 women) in three sections of introductory psychology classes taught by the researchers. Eighty-seven percent of the participants were first or second year students and 75% were white, 15% African-American, 4% Asian, and 2% Hispanic/Latino. Approximately 97% of the participants were traditional undergraduate students who ranged in age from 18-22. The control group was similar but the 78 introductory psychology students in this group had not received online search training.

Prior to beginning the data collection for part one of the project, the participants had to operationally define “bad boy” with each student finding three women to complete the statement “a bad boy is…..” The descriptions were collapsed into the definition of what a bad boy is. Next, a short survey was administered by each student to five college women. While the data were being collected, the researchers introduced the online search assignment. In class, they explained that the assignment was designed to improve the participants’ information literacy and the researchers provided each student with a set of written instructions to search PsycINFO to find two articles relevant to the term “bad boys”. The next assessment required the participants to prepare a plan for conducting library research on a specific debate topic. They had to imagine that they needed to locate three articles as background for the debate. While a more exact assessment of information literacy proficiency would have permitted them to choose a search engine (Yahoo or Google) or a library database, the researchers required them to use library databases and
perhaps negated a key component of information literacy-- the ability to choose the most appropriate resource to find information.

An experienced academic librarian at the university graded the participants’ performance after all identifying information was removed. The librarian assigned a score of 1 to 3 with 3 being the highest score. The criteria were as follows: the student did not exhibit familiarity with the research process using resources provided by the library, the student was able to locate studies by demonstrating familiarity with the steps of a literature search, and the student used relevancy criteria to choose studies.

The researchers found that the librarian evaluator assigned much higher grades to the participants who had been in the instructional group and had completed the online search assignment (M=2.11, SD=0.85) than to those participants in the control group (M=1.5, SD=0.77), t (206) = 5.31 p < 0.001. Participants in the instructional group were significantly more confident in their ability to find information, were less likely to feel they needed help, and rated the literacy evaluation task as less difficult than did participants in the control group. Pines and Larkin reported that the participants in the instructional group also felt more confident than the other participants in their ability to effectively find information on Yahoo and Google. The researchers were surprised by the no difference between groups in their ratings of the importance of using academic databases, and they concluded that their hands-on research project developed information literacy proficiency among introductory psychology students. It was not clear if the participants in both groups had received any exposure to information literacy prior to enrolling in the introductory psychology course. This may have accounted for the high grades for some control group participants.
After a 2003 pilot study at a central California university that analyzed term paper bibliographies for a senior capstone course, Knight (2006) assessed undergraduate students’ achievement of information literacy learning outcomes in a first-year research and writing course. The assessment rubric, developed in collaboration with several faculty members, required all students to prepare a list of 10 sources that included critical and evaluative annotations and complete documentation according to several current style manuals. The goals of the assessment sought to objectively measure the students’ success in achieving the research objectives of the course using the ACRL Standards as a guide, to compare students’ use of Web sites versus scholarly sources, to determine if the learning outcomes varied according to the students’ learning levels (Honors, Regular or Service Learning), and to identify areas that required greater instructional attention. The levels of achievement (Beginning, Proficient, and Advanced) were defined for each learning objective and were explained to the first-year seminar teaching faculty and students at the beginning of the course. The librarian received 260 bibliographies which represented close to 30% of the students enrolled in the first-year seminar and began her assessment at the completion of the course. The assessment was independent of the grade that the students received for the first-year seminar course. The researcher trained a student assistant in the use of the rubric to provide inter-coder reliability and her scores were compared with those of the researcher. In situations where scores had wide divergence, the papers were examined again. Unfortunately, the inter-coder reliability scores were not provided which may have implications for the validity of the rubric assessment. The fact that the researcher did not define the specific characteristics (e.g. distinguishing between print and electronic resources in citations) of correct
documentation for the students made the application of the rubric more difficult. This suggested that the assessment tool was not a rubric.

Thirty-five percent of students in all three sections (regular, honors, and service learning) scored at the beginning, proficient, and advanced levels for locating scholarly journals. While the use of scholarly journals was required in the assignment, the students’ work demonstrated the influence of the readily available and popular search engines. Thirty-seven percent of the honors level students choose scholarly resources at the proficient level compared to 33% of the regular students and 29% of the service learning students. Seventy-two percent of the regular students were proficient in identifying the usefulness of sources compared to 77% of the honors students and 59% of the service learning students. For the evaluating credibility objective, 27% of the regular students were considered proficient, 26% of the honors and only 19% etc students were. Fifty-three percent of the regular students wrote descriptive, critical, and evaluative annotations while 58% of the honors and 47% of the service learning students were proficient for the objective. The final objective, formatting citations correctly, indicated that 59% of the regular and service learning students scored at the proficient level compared to 37% of the honors students. Given the other proficiency scores received by the honors students, it was surprising that the honors students scored lower than the other learning level groups. There was no discussion regarding this outcome.

Knight (2006) concluded that the students in all learning levels demonstrated the ability to locate and evaluate information in support of arguments and that the lack of significant difference among the learning levels suggested that information literacy instruction might need to be designed for the specific classroom environment. Further, it
was suggested that more emphasis on how to distinguish between popular and scholarly journals and proper documentation is also needed. Finally, Knight recommended that the use of similar assessment tools could play an important role in the influence of cultural change in organizations reluctant to accept the importance of information literacy as an integral and valued component of the student’s educational experience.

In another study at a central California technical university of close to 17,000 students, Maybee (2006) conducted a phenomenographical study to examine undergraduate concepts of information use. According to the researcher, phenomenography is research methodology developed by educational researchers in Sweden in the 1970s. This approach is used to find and systematize forms of thought in terms of which people interpret aspects of reality. Although the researcher did not provide information about the number of participants and pointed out that the results may not be generalizable, he sought to include participants who represented different majors, year levels, and gender composition of the academic community. Ethnicity was not a variable.

The researcher, informed by a pilot study, decided to use the term “information use” rather than “information literacy”. The five interview questions were as follows: How do you use information to complete class assignments; how do you use information outside of your coursework; tell a story of a time when you used information well; describe your view of someone who uses information well; and describe your experience using information. The interviews were taped and transcribed.

Maybee’s analysis of the data found three unique categories that reflected undergraduate students’ experience of information use. Information use was seen by the
students as finding information located in information sources (category one), as
initiating a process (category two), and as building a personal knowledge base for various
purposes (category three). Undergraduate students experienced information use in a
complex, multi-tiered manner that needs to be addressed by those involved in planning
information literacy pedagogy. In order to enhance student information literacy learning,
it was recommended that educators should be prepared to guide learners to conceptualize
information use in a variety of ways which would help learners to address their
information needs. Further, professional development opportunities, designed to increase
information literacy educators and administrators’ understanding of the benefits of
applying a relational approach to embedding information literacy values into the
curriculum, must be established.

It was concluded that undergraduate information literacy training that focuses on
a list of skills or attributes is inadequate and does not completely address students’
information literacy needs. A relational approach should be used to embed information
literacy values into course curricula to facilitate students’ using information in a
conceptual and more complex way.

Weetman (2005), in another study conducted at a university in the United
Kingdom (UK) with 19,000 students, explored what information literacy faculty
academic staff thought students should possess by the time they graduate. He wanted to
know what the expectations of teaching staff were in terms of the information and
research skills of the final year students, and in what ways did the teaching staff
expectations fit with the conceptual framework of the Seven Pillars of Wisdom, a model
similar to the Big Six, which outlined seven stages of acquiring information literacy
knowledge. Four hundred and seventy-eight faculty across all six schools and colleges and three campuses were surveyed with a response rate of 21%. The results showed a high level (93%) of support for information literacy and for the expectation that students should have acquired these skills by the time they graduate. Ninety-eight percent of the faculty believed the role of the academic librarian was important for the development of information literacy proficiency.

It was concluded that while information literacy is important to faculty and of relevance within educational management in general, faculty have a tendency to expect that information literacy competence will just be “picked up” by students whether by osmosis or other unknown methods. She recommended that faculty and librarians collaborate to ensure a well-structured, information literacy program to replace the “osmosis technique.”

Finding, evaluating, and using information efficiently are among the most significant challenges to all professions, particularly in the business world (Kendall & Wu, 2005). In order to effectively deliver on-demand information literacy instruction to business students at a large public university in the San Francisco Bay Area, Kendall and Wu conducted a pilot project to identify the best practices for providing information literacy sessions for in mandatory junior-level business research and writing course. The authors wanted to know the business faculty’s expectations of information literacy proficiency, and how librarians and classroom teachers could collaborate effectively to improve information literacy and library research skills. Every semester close to 30 sections of the course were offered and each course had approximately 25 students in each section.
The researchers distributed the survey to all (n=30) business faculty members who were teaching the business research and writing course. They asked for the following information: (1) list three business skills students should know by the end of the semester; (2) what projects are assigned for which students are expected to use library resources; and (3) what can librarians do to help faculty and students. The survey also asked the faculty to rank business information literacy criteria that were developed by a sister institution. The researchers did not provide information about how the criteria were developed.

Ninety-two percent of the faculty returned to the survey and more than 50% listed library research skills and ethics of plagiarism in response to item 1. In item 2, all faculty members expected students to use library research to complete their assignments and in item 3, all but two respondents expected an information literacy session at the library. As a result of the survey, librarians increased their outreach efforts to faculty and information literacy session requests increased by 50%.

Encouraged by the pilot survey, Wu and Kendall (2005) expanded the survey to all 23 campuses in the university system and included 82 business faculty recommended by librarians throughout the system. Sixty-one participants (74.39%) returned the survey; 93.4% of those had worked with a librarian in the past to meet various needs. The primary expectation or request from the faculty was to have librarians conduct over-all presentations in the use of available library resources and search skills. The second request was for librarians to provide research tools that gave students guidance to use library resources. The least ranked expectation was that librarians integrate technology (e.g. PowerPoint) into their presentations on using library resources. The leading skills
participants thought students should have included writing and the ability to think critically and analytically. The participants ranked an in-depth research project and/or case study or a group research project as the top assignment that required the use of library resources. The ability to find company information and current awareness sources were ranked as the two most important information literacy competency criteria.

The researchers concluded that information literacy can be integrated into business curricula to prepare business students for life-long learning. They recommended that librarians and teaching faculty should work together to develop tools and information literacy lecture plans to meet course and information literacy competency expectations. The study provided useful information for academic librarians who have the responsibility for working with business and other subject-matter faculty to integrate information literacy into curricula. However, more information about the development and validation of the instrument might lead to the study being replicated in other disciplines.

East (2005) provided an in-depth, creative review of the literature in his effort to suggest ways in which the knowledge of user behavior in the humanities could be applied to the development of an information literacy syllabus that defined information literacy competence for the humanities researcher. The syllabus was based on the humanities faculty’s information habits research. The proposed syllabus was divided into two parts that would outline general skills and specific formats which were then divided into a number of sub-sections. General skills would require the humanities researcher to be able to understand how information is disseminated in the disciplines, identify print and electronic bibliographic tools, search databases effectively, keep current with new
publications and develop strategies to do so, know how to obtain information not available locally, consult librarians, and organize references effectively. Specific formats would recommend that they use bibliographic tools to identify relevant books, be able to use relevant tools for identifying relevant print and electronic journals, be aware of the value of book reviews and edited works and the value of theses and unpublished material, and be able to effectively use Web resources and other relevant formats.

East has used the syllabus to plan information literacy classes for researchers at a major university in Australia and reported a positive response from trainees. He pointed out that librarians with responsibility for teaching information literacy to postgraduate researchers understand that the researchers have specific and diverse information needs and that humanities faculty should design courses based on what is known about the information habits of the discipline.

Knowledge of information literacy is an important component of K-12 education (AASL, 1998) but the literature at the K-12 level seems to be primarily practice based rather than research based. However, a number of researchers have explored the importance of the knowledge of information literacy in recent years. Heil (2005) conducted an action research study to answer four questions regarding student use of the Internet. She wanted to determine the following: Why students find the Internet so appealing? Do students know the credibility of sites on the Internet? Do students know how to evaluate sites before using them and would a unit to critically evaluate Internet sites increase the information literacy of the students?

Participants were selected from a school district located in a small rural Midwest community with 47% of the students eligible for free or reduced-price lunches. The
school served 391 students, 98% white and 2% Native American. Of the total eighth-
grade class, 14 students (50%) participated in the study; all were white. Prior to the unit
on information literacy, a survey was administered to assess the students’ research habits,
knowledge of the Internet, and critical evaluation skills. Results indicated that 75% of the
students used the Internet for games and socialization activities such as email. While all
of the students used the Internet for research projects, 71% used the Internet before
considering other resources and 85% of the students either did not choose to or did not
know how to critically evaluate Internet sites. According to Heil, the students’ responses
reflected results that were similar to other researchers’ data that indicated students’ poor
understanding of the Internet. Following the author’s unit on information literacy and
Internet use, the students’ responses to the open-ended questions provided the greatest
change in perception about the Internet. The students no longer thought the large amount
of information available on the Internet was its best characteristic. The two disadvantages
most chosen by the students were too much information that required critical evaluation.

The researcher concluded that students generally find the Internet appealing
because of the large amount of information that it provides but the students do not know
how to critically evaluate Internet sites. Results of the unit on information literacy and
using the Internet improved the students’ understanding of the resource. The study lacked
rigorous research but provided a micro-picture of the information skills of some K-12
students in rural settings. The study, given the small sample size, is not generalizable to
other communities or settings.

In a qualitative study, Gunsauls (1998) described the implementation of critical
thinking and information literacy instruction in the library media curriculum for two
fourth grade classes (46 students) in a southern, urban, elementary school that served close to 300 students in a K-6 setting. The school population was 90% white, 5% African-American, 3% Asian-American, and 1% each Native American and Hispanic. The two classes closely reflected the school’s demographic. The academic achievement in the classes mirrored the rest of the student population and students had a variety of learning styles, backgrounds, and aptitudes. During the 1997-98 school year, several students qualified for special education. Some students needed remedial assistance in reading and math. One student was gifted. As a group, the students scored in the 75th percentile on nationally-normed standardized tests. The teachers in these classrooms communicated regularly and frequently used similar instructional styles and approaches. One teacher had 24 years experience teaching third through fifth grade and the other had taught for nearly 10 years and in a wide variety of learning levels in third through fifth grades.

The research was conducted in three phases. The first phase focused directly on teaching thinking skills. The second phase introduced the Big Six model with references to the thinking skills that were introduced in phase one. Phase three gave the students the opportunity to independently apply the skills learned in the previous phases. The students received 30 minutes of instruction each week for 9 months in the library media center.

A variety of methods were used to collect data. She administered a preliminary and concluding questionnaire, reviewed student created artifacts and journal correspondence, and documented classroom teacher observations and conversations. Her own journal notes and reflections supplemented the data. The study answered the following questions: How did the school library media specialist impact the development
of critical thinking and information literacy of these fourth grade students? What were the effects of instructional and developmental issues on learning critical thinking and information literacy? What factors, including elements of education reform influenced the implementation of critical thinking and information literacy instruction in this elementary school?

Results suggested that fourth graders are developmentally ready to explore the processes associated with critical thinking and information literacy. The natural curiosity, at that age, led to willingness for them to investigate and embrace abstract concepts. One of the major difficulties found was the students’ inability to articulate what they wanted or needed to find out about. Their ability to pose appropriate questions for their tasks was generally insufficient. While the students were generally able to learn the information presented to them, they experienced difficulty integrating the information to utilize additional resources and to create their own understandings. Finally, fourth grade students, who scored in the 75th percentile of the standardized test, demonstrated a low level of information literacy as measured at the beginning of the study.

It was recommended that because the library media center holds the keys to facilitate lifelong learning habits of today’s students, the library media center should maintain effective collections that provide a variety of resources to meet curricula needs. Further, collaborative efforts between classroom teachers and the library media center enrich the learning environment for students therefore a conscious effort should be made to enhance collaboration. Finally, continued instruction and support for additional thinking skills and opportunities to use the Big Six model which would increase the metacognitive awareness of these students and expand their self-assessment skills were
recommended. It was recommended that further research should investigate the relationship between achievement, as measured on standardized tests, and increases in information literacy after a year of critical thinking and information processing skill instruction. This could be valuable for teachers and librarian/media specialists.

Wolf (2000) conducted a two-group quasi-experimental study to determine whether the *Big Six Information Skills Model* was an effective metacognitive scaffold for students to solve information-based problems. The primary question asked was whether there were significant differences in achievement and attitudes between students who use the Big Six methodology and students who do not while solving an information-based problem. The data collected to determine if students demonstrated significant differences in achievement were the scores given to the newspaper articles the students were requested to write. The participants were 36 students in two eighth-grade social studies classes in a major southwestern city. Each class had 18 students and was divided equally between male and female. The students were from primarily upper middle class families and attended a private middle school. The students were 97% white and 3% East Indian/Hindu. The researcher acted as both participant and observer in the study.

Each student completed a 15-item multiple-choice pre-test before the study began. The pre-test verified the students’ lack of knowledge about the events surrounding the Selma March during the African-American Civil Rights Movement. Each student also received a Big Six packet of materials during their introduction to the Big Six and introductory lesson and was interviewed to assess his or her attitudes about research projects and the Big Six skills. Teachers reflections about class activities were recorded at the end of each class day and the data were used to confirm the researcher’s observations.
The two classes of students were asked to write newspaper articles that summarized the events surrounding the Selma March. The students reviewed a multimedia CD-ROM that contained information in a variety of formats, including text, video, and audio. One classroom teacher followed the procedures of the Big Six model and the other class followed an instruction process determined by that classroom teacher.

There were statistically significant differences in achievement between the two classes. The students in the Big Six class received an average score of 12.72 (n = 18, M = 12.72, SD = 1.64) out of a possible 17 points compared to students in the non-Big Six class that received an average of 11.00 out of 17 points (n = 15, M = 11.00, SD = 1.36). The data indicated no statistically significant differences between the classes in relation to attitude about the project. Over 88% of the students in both classes reported that the project did not make them feel nervous or “dumb” and over 75% of the students reported that they felt comfortable researching a topic they knew little about. Finally, 77% of the students in both classes felt the project helped them to understand the Civil Rights Movement better than if they had just read about it in a textbook.

Wolf (2000) concluded that following the procedures of the Big Six may have caused students to shift their mental focus from a procedural activity to an internal mental process. The students in the Big Six class demonstrated that they were more aware of how their thinking affected the decisions they made. In addition, the researcher concluded that following the Big Six may positively influence the student’s engagement with a topic. The researcher suggested that when the Big Six is implemented as a metacognitive scaffold the students’ success will improve in both cognitive and affective areas. It was recommended that educators should help students utilize an organized problem-solving
process beyond the classroom to encourage deliberate and systematic approaches to problem-solving.

**Teacher Education and Information Literacy**

In one of the first major studies to assess the information literacy knowledge of education students, Morner (1993) designed a test of library research skills for doctoral students in education. This test was in response to literature that suggested that these students were unprepared to conduct dissertation literature reviews. The researcher initially developed a pilot interview study of 15 doctoral students that investigated their library knowledge, patterns of use, and attitudes. The researcher employed a number of steps to develop test content and wrote multiple-choice items for eight content clusters based on the 1992 recommendations developed by ACRL and two of its membership sections for education and library instruction librarians. The key content clusters included: (1) how literature is generated, intellectual access; development and refinement of the research problem, (2) intellectual access; (3) selecting appropriate content sources, and (4) intellectual access; selecting appropriate bibliographic sources, and knowing parts of a citation.

The researcher tested a random sample of 149 education doctoral students from three private universities in the Northeast. The validated test contained 21 attitudinal/demographic questions and 41 items about aspects of library research. The test was administered during class time. The researcher’s overall response rate was 75% and the test reliability was .72. The scores ranged from 14.6% to 82.9% correct and the average student answered only about 50% of the items correctly. The mean score was 21.95 out of 41 points, the standard deviation was 5.35 and the standard error of
measurement was 2.8. While the ethnic diversity of the sample is not known, the researcher indicated that the attitude and demographic data showed little variation in subgroups such as gender or full or part-time student status.

Based on the findings, the researcher concluded that her research corroborated previous findings that many education doctoral students are unequipped for the doctoral-level library research necessary for conducting the dissertation literature review. She suggested that many doctoral students fear libraries and dread the literature review. She recommended that the test be given to other groups of doctoral students in other parts of the country including students attending public and private university and colleges. Administering the test at institutions with fewer library resources might reveal a correlation with students’ scores. Finally it was recommended the test might be revised for education masters students, many of whom are required to write a master’s thesis and who also need to be able to effectively find library resources.

Gallegos and Rillero (1996) urged teachers to develop effective search competencies to find teaching resources on the Internet and in databases. They reported that access to information is important for in-service and preservice teachers and the best time to develop these abilities is in teacher education programs. The authors recommended the following suggestions for teacher database competencies: teachers should be able to describe the structure of databases, define goals for their search, choose appropriate databases, operate computer software to conduct a search, search with controlled vocabulary and with free text (natural language), use Boolean logic to develop search strategies, and retrieve records identified from a search.
O’Neil (2005) based the development of the *BEILE Test of Information Literacy for Education* on Morner’s instrument. While the focus of this research was to validate the instrument she developed, the BEILE was administered to 172 teacher education students in central Florida and only 76 of them, based on their test scores, were considered to be competent in the knowledge of information literacy. It was recommended that additional studies be conducted with samples that differ from the current sample and that results of the study would be more tenable with data from a larger number of test takers from various institutions of differing sizes and regions of the country.

According to Templeton and Warner (2002), the current focus on information literacy in undergraduate education has direct implications for teacher education. The authors conducted a qualitative case study, as a pilot project, in the oldest, public co-educational teacher preparation program in the nation with 5,500 students. Approximately 650 students are enrolled in Early Childhood and Elementary Teacher Education programs. The study presented a method for introducing teacher education students to a model of information literacy that engaged them in problem solving that was directly related to course objectives. The study explored how an education resource librarian and a faculty member collaborated to provide information literacy instruction that engaged the students in information literacy instruction that went beyond the traditional bibliographic instruction lecture format to employ active learning methods and constructivist principles in a required course for upper level teacher education students in the elementary education program.
The participants included 200 teacher education students enrolled in required education courses over a period of eight academic semesters from 1997-2001, an education faculty member, and the education resources librarian. Prior to implementing the course-integrated information literacy model, the researcher surveyed 34 members of the education faculty to assess their support for information literacy and their goals for student learning. Sixty-two percent (21) of the 34 faculty members responded. The survey results, an examination of teacher education students’ units, and feedback from cooperating teachers were used by the Templeton and Warner to develop their research questions: What are the attitudes and expectations of education faculty toward teacher education students’ information competency? How does the information literacy program contribute to the development of teacher education candidates?

The information literacy model provided opportunities for the teacher education students to construct their own knowledge in the context of active research that connected course work and field experiences with hands-on information literacy exercises. The education resources librarian scheduled information literacy instruction sessions at critical points during the semester when the teacher education students were engaged in projects that required research support materials. For example, in one course that required the teacher education students to integrate children’s literature into elementary school curricula; an information literacy session that introduced the students to children’s literature resources, Internet sites, and library databases was designed collaboratively with the education faculty member. The class was conducted in the Education Resources Center.
According to the authors, successful information literacy instruction in public schools depended on the ability of school librarian/media specialists to work effectively with classroom teachers and teacher education students. As a part of the study, the education resources librarian and an education faculty member conducted workshops for school librarian/media specialists that provided guidelines for school library media facilities and personnel, current research on information literacy, effective Internet use, and strategies for collaborating with school based faculty and teacher education students.

Eighty-five percent of respondents to the faculty survey required teacher education students to conduct research for one or more assigned projects. Lesson plans and thematic interdisciplinary units were reported as the most frequently assigned research projects followed by research papers and book or article reviews. Over half of the responding faculty indicated that teaching independent learning skills as opposed to teaching specific facts, concepts, and methods were their first priority. The faculty reported that teacher education students’ essential skill is the ability to synthesize information gathered from many sources. The education faculty also reported that teacher education students need to be prepared to teach information literacy in Preschool-12 classrooms and that instruction should be done collaboratively with the librarian. Most of the education faculty agreed that Preschool-12 teachers are in a better position to help their teacher education students become information literate when they receive instruction themselves during their teacher education program.

Analysis of evidence found in teacher education students course documents and field experiences indicated that most teacher education students had successfully integrated many of the objectives of the information literacy instructional process.
Unfortunately, the authors’ research was not clearly reported and in some cases the entire universe of participants was not clearly delineated. In addition, the workshops for school librarian/media specialists seemed not to be connected to their study. However, the study demonstrated that teacher education students in this situation successfully integrated information literacy into their academic work and student teaching experience. Evaluation by school-based faculty and college faculty demonstrated that teacher education students’ projects and teaching skills were enhanced by course-integrated information literacy instruction.

Martorana, Curtis, DeDecker, Edgerton, Gibbens, Lueck, and (2001) found undergraduate students’ research skills, at a large central California public university, to be poor. Many of the students lacked the skills to evaluate scholarly resources. Instruction librarians found students in their classes using inadequate or even inaccurate materials for research papers, while faculty members increasingly reported finding unsuitable magazine articles or web sources in student bibliographies. The librarians began to ask: Why are we seeing an increasing lack of effective research skills? How are information literacy standards being implemented in the secondary schools? How students’ information literacy knowledge can be improved before coming to the university? How can we impact student academic success?

A team of librarians at the institution developed an outreach program designed to benefit the greatest number of high school students attending partner schools with a focus on training the trainer. Workshops were developed to work directly with teachers, instructing them in implementing information literacy into their curriculum. The workshops were designed to examine information literacy standards and models, provide
technology training, present strategies and activities for teaching information literacy, and teach how to critically evaluate databases and websites. The primary goal for the project was to provide students with a more successful transition to college.

The team of librarians initially met with a school librarian and media librarians at the County Office of Education who provided advice on program content, technology certification for teachers in the local schools, and strategies to use in marketing the program to school administrators. To encourage teacher participation stipends were offered. Additional stipends were offered to those teachers who implemented the classroom component and arrangements were made for the school to receive access to a number of databases. Following a series of publicity efforts, teachers who agreed to participate in the project were sent a questionnaire which asked for a self-assessment of their research skills and technology capabilities and their students’ research skills.

The first workshop was presented at one of the partner schools. The team of librarians collaborated with the school librarian who served as an essential partner in teaching the research process by providing hands on training of the databases available at the school. The second workshop was presented at the university and included a presentation by the Director of the Writing Program who described what students needed to know to be successful as an undergraduate.

The workshops were revised based on feedback from the teachers participating in the program. The teachers worked with the team librarians throughout the school year and were asked to assess the impact of the information literacy instruction they received which had been integrated into lesson plans and assignments. They were also asked to assess the impact of this instruction on student performance in completing research
assignments and projects. The authors reported that a number of methods were used in
the assessment including various student evaluation forms and pre- and post-test. These
instruments were not identified for possible replication of the project.

Martorana et al. (2001) reported that the outreach project enabled teachers to
incorporate information literacy components into their curriculum. Various high school
curricula were changed based on the workshops and techniques. One teacher reported
incorporating information literacy into research assignments for every student. In another
school district, research modules are being developed to be used as a standard for all
continuing high school classes. Finally, the authors reported the library’s visibility had
been raised on the campus with a collaborative project launched with the school of
education which requested workshops for their teacher education program.

While this project was not an empirical study, it does suggest that collaborative
efforts between academic and research librarians and secondary teachers can enhance the
information literacy competence of both secondary teachers and their students.

Frier, Musgrove, and Zahner (2003) reported that before a student can become
information literate as defined by the ACRL Information Literacy Competency
Standards, he or she must be taught information literacy. Higher education cannot
produce information literate students if it does not have information literate teachers. The
authors conducted a needs assessment to investigate the current and optimal levels of
information literacy among faculty members at a small (1,250 students), two-year, public
institution in Georgia.

The institution’s 41 full-time faculty members were asked to complete a close-
ended survey that included objective general questions concerning the perceived current
and optimal levels of information literacy among the institution’s faculty, the needs of those who are information literate and the needs of those who are not, and the causes for why a gap exists between the current and optimal levels of information literacy among the faculty. Six faculty members, two from each major academic unit on campus, were randomly selected to participate in an interview after the surveys were tallied. The academic units included the Division of Humanities and Learning Support, Division of Business and Social Sciences and Division of Science and Mathematics.

The in-depth interview questions sought to gather data that would measure the gap between the current and optimal levels of information literacy, identify areas of concern for those faculty who are using technology as well as those who are not, and requesting support from those faculty members who are information literate to help bring those who are not up to task. The ACRL Information Literacy Standards for Higher Education were adapted to determine the information literacy competence of the faculty. The data from the interviews was compared to the Standards to assess which faculty members are information literate and which are not. Each participant’s interview was rated on a scale of one to five with one being “Optimal Level of Information Literacy” and five being “No Level of Information Literacy.” The closed-ended survey questions included “Strongly Agree,” “Agree,” “Disagree,” and “Strongly Disagree.”

Eighteen faculty members (43%) returned the survey. Sixty percent of the faculty members who returned the survey considered themselves information competent as defined by the ACRL Standards. The researchers reported several intriguing results and a few problems in the design of the instrument. Faculty members preferred traditional printed resources for gathering information, yet preferred electronic resources for finding
supplemental information. The survey found that a majority of the participants do not know the laws and ethical standards associated with copyright and the Internet and most faculty members believed that even if specific technology were made available, a teacher would continue to rely on traditional means of information gathering. A major design flaw in the instrument was that several faculty members could not speculate on general questions that asked them to rate the information literacy of all faculty. The researchers were surprised that most of the participants could distinguish between technology literacy and information literacy even though this was not discussed by the interviewer. A majority of the participants agreed that a teacher’s use of technology in the classroom did not necessarily reflect knowledge of information literacy.

Frier et al. (2003) concluded that several steps could be taken to help faculty members become even more information literate. The steps included holding on campus conferences and workshops that would incorporate the latest electronic resources and databases, holding teaching circles with teachers from varying disciplines to discuss how they gather information, and for the administration to promote the scholarship of teaching which would include the exercise of information literacy proficiency.

The results of the study were compromised due to the design flaws in the study and connections to the impact on the students’ information literacy competency were not made. Given the small sample size and the size of the institution, and the design flaws, the results of the study are not necessarily generalizable. However, the study did provide some important insights regarding the need for teachers at all levels of education to have information literacy competence.
Asselin and Lee (2002) reported that many preservice teachers indicated that they did not develop information literacy competency during their teacher education and the authors suggested that teacher education students are struggling in today’s complex information society. The authors started an information literacy project to improve information literacy instruction in K-12 schools and recommended beginning with preservice teachers to increase the likelihood that future teachers would be able to incorporate information literacy into their evolving concepts of information literacy and their classroom teaching.

In a study that explored teacher education student’s understandings of information literacy and Information and Communication Technology outcomes before and after being involved in a class that promoted and explored issues of information literacy and resource-based learning, Branch (2003) found that although participants were able to define information literacy only 40% felt that it was important to help their students become information literate. All of the participants felt more information literate as a result of the instruction that they received. The participants felt more ready to identify an information need and to think critically about the best resources available to meet that need. In addition, the participants felt more ready to access community resources to locate information; critically evaluate information found on the internet; and the ability to present students with different styles of projects. However, few of the participants felt responsible for teaching information literacy to their students. The researcher concluded that teacher educators may need to shift from helping teacher education students to become information literate to helping them integrate information literacy into their teaching.
Walter & Shinew (2003) suggested there is recognition among teacher educators and librarians that existing teacher education and administration education programs continue to neglect information literacy instruction in the teacher education curriculum despite national reports urging programs to do so. This current study may contribute to more inclusion of information literacy into teacher education programs.

Summary

This overview of the digital divide and information literacy, information literacy in K-12 and higher education, and information literacy in teacher education suggested that the digital divide remains an issue for students and public school systems. Although a number of programs and curricula changes have been made to include information literacy knowledge, it appears more collaboration between teacher educators and academic librarians’ needs to occur. The literature suggested that preservice teachers are graduating without the information literacy proficiency they will need in the classroom. The literature also suggested that teacher educators in Canada, Australia, and New Zealand (Asselin & Lee, 2002; Gibson & Oberg, 2004, Manathunga, 2002; Wilson, 1997) may provide leadership to their U.S. colleagues in effectively connecting teacher education and information literacy.
CHAPTER III

METHODOLOGY

Research Design and the Variables

This descriptive study examined the information literacy knowledge of graduate teacher education credential students in both general and special education training programs. There were two dependent variables in this study. The first was the knowledge of information literacy (the ability to find, evaluate and appropriately use information) as measured by the Beile Test of Information Literacy Skills for Education. The second dependent variable was readiness to integrate information literacy into instruction as measured by the researcher-designed Readiness to Integrate the Knowledge of Information Literacy into Teaching Survey. The four independent variables were in the graduate teacher education program area: general education or special education; training or no training in information literacy; whether the graduate teacher education students are teaching in low or higher socioeconomic schools; and the students’ self-rating of information literacy competence in databases and Internet searching.

Research Questions

1. Do graduate general education and special education students differ in their knowledge of information literacy?

2. Do graduate general education and special education students differ in their readiness to integrate information literacy into instruction?

3. Do graduate teacher education students who have training in the knowledge of information literacy differ in their knowledge of information literacy from those without training?
4. Do graduate teacher education students who have training in the knowledge of information literacy differ in their readiness to integrate information literacy knowledge into instruction from those without training?

5. Do graduate teacher education students who teach in low socioeconomic schools differ in their knowledge of information literacy compared to those who teach in higher socioeconomic schools?

6. Do graduate teacher education students who teach in low socioeconomic schools differ in their readiness to integrate information literacy into instruction compared to those who teach in higher socioeconomic schools?

7. Do students who self-rate their information literacy ability to search databases as high score higher on the Beile Test of Information Literacy for Education compared to those who rate themselves as low?

8. Do students who self-rate their information literacy ability to search the Internet as high score higher on the Beile Test of Information Literacy for Education compared to those who rate themselves as low?

*Description of the Teacher Education Programs*

In California, unlike many other states, teacher credential programs are offered at the graduate level and are primarily internship teacher training programs. Classes at both universities are offered in the evening and on weekends. Both universities offer classes at a regional campuses and students can attend full or part-time. The graduate education programs at both universities provide students the opportunity to earn both a general education teaching credential in either elementary or secondary education, approved by the California Commission on Teacher Credentialing, as well as a Master of Arts in
Teaching or a Masters of Science in Curriculum and Instruction. Students may choose Preliminary Elementary Multiple Subject or Preliminary Secondary Single Subjects teaching credentials. The Special Education programs prepare the graduate education students to teach diverse K-12 students with high incidence disabilities.

Participants

The participants (N = 126) in this study were preservice teachers enrolled in similar graduate general and special education credential programs at two private universities in northern California. The participants were interns or teaching while going to school. The researcher included special education teacher education students in this study to contribute to the research literature regarding special education students’ knowledge of information literacy in the context of the digital divide that impacts many poor and urban schools. Many of the participants in this study were teaching or planning to teach in California which has the greatest shortage of educators in this specialty (CDE, 2005). Coupled with the increased enrollments of special education students and the fact that certain sub-groups (African American and Hispanic) are over represented (CDE, 2006), it was important to assess special education teacher students’ knowledge of information literacy and their readiness to integrate information literacy into their classroom teaching. Based on the demographic data collected in this study, 64% of the participants were enrolled in graduate general education and 35% were enrolled in graduate special education. The participants ages ranged from 21 to over 55, but the majority (63%) were between 21 to 30 years of age. Seventy-three percent were female. Sixty-two percent of the participants were white and 48 (38%) were Latino, Black, Asian, Asian American, or Asian Pacific Islander. Sixty four percent of the participants taught in
urban or inner city school systems. Seventy-four participants (59%) taught in elementary
schools and 32% taught secondary. A small number of participants did not teach (n= 14).
The majority of the participants (53%) taught in low socioeconomic schools. Some of the
graduate special education participants were from out of state; in addition some had a
personal disability or a family member with a disability.

Protection of Human Subjects

The rights of all participants were protected in accordance with the policies and
standards of the Institutional Review Board for the Protection of Human Subjects at the
University of San Francisco. The study participants received a Consent to be a Research
Subject form and a copy of the USF Research Subject’s Bill of Rights. The participants
acknowledged their consent by signing and returning the completed forms and surveys.
The data from this study were stored in a secure location and participants were not
identified by name. Participation was anonymous and confidential.

Instrumentation

Two surveys were administered: the Beile Test of Information Literacy for
Education (see Appendix A) and the researcher-designed Readiness to Integrate the
Knowledge of Information Literacy into Teaching Survey (see Appendix B). The
instruments were administered to several classrooms over a three-week period during the
2007 spring semester.

The Beile Test of Information Literacy for Education (O’Neill, 2005), based on
the ACRL Information Literacy Competency Standards for Higher Education (2000)
measured the student’s knowledge of information literacy. It was developed by Penny
Beile O’ Neil over a two-year period and included two major phases. In the first phase,
O’Neil developed a bank of education-specific test items; in the second phase she validated the single form instrument. The Beile contains a total of 35 multiple choice items. Thirteen of the 35 items are demographic questions (see Appendix A).

The Beile (2005) was designed specifically for undergraduate students enrolled in a teacher education program and was administered electronically and in print to a field sample of 172 education students in the fall of 2004. The instrument takes approximately 30 minutes to complete.

Content validity for the 22 test items was established by five content experts (academic librarians with backgrounds in information literacy from 5 universities and experience working with education resources) (O’Neill, 2005). The mean reviewer scores for the 22 items, on a scale of 0 (low) to 3 (high), was 2.67 for accuracy, 2.47 for clarity, and 2.85 for institutional objectivity.

Criterion validity was established by comparing the scores of participants who took the written test with those who took the test in the library on the computer. Approximately 79% of the item answers did not change. Only 12.5% changed from correct on the written test to incorrect on the in-library computer test; another 9% changed from incorrect on the written test to correct on the in library computer test.

O’Neill’s initial factor analysis (Bartlett’s Test of Sphericity) of test data suggested four factors that explained 21% of the covariance among items. Next a five factor analysis was performed which explained 23.5% of the covariance among items. Distinct subscales were not found. The mean score for the participants was 11.97, or 54.4%. The passing score for the Beile was calculated using variants of the Angoff method which included a panel of experts to judge what portion of 100 information
literate test takers should answer each item correctly. The sum of the expert panel’s estimated proportions was averaged to obtain a preliminary passing score. The preliminary passing score calculation revealed that 55.5% of the items would need to be answered correctly for the test taker to have acceptable levels of knowledge of information literacy. The mean score for the field administration was 54.4% but the panel of experts adjusted the passing score level to 58.8%. The adjusted scores were influenced by item difficulty levels and the fact that participants who completed the test had different levels of instruction in information literacy. The panel of experts expected higher scores from a group of instructed students. Individual item percentages were adjusted down to allow for test error measurement and to minimize the impact of false negative scores. Finally, based on these calculations, the panel of experts decided test takers needed to achieve a score of 57.5% to be considered acceptably competent in information literacy knowledge. Seventy-six of the 172 students in the sample met that goal.

O’Neill’s (2005) reliability estimates measured the stability and internal consistency of the instrument. A test-retest procedure for stability was conducted with 11 students approximately two weeks after the first administration of the Beile. The Kuder Richardson 20, to measure internal consistency, revealed a reliability coefficient value of .67 and a standard error of measurement of 1.29. The mean score for participants was 54.4% or M = 11.97 with a standard deviation of SD = 3.74. The difficulty levels of the test items varied and none of the test items had a negative discrimination value.

The Beile was modeled after the Morner Test of Library Research Skills (1993) that assessed the information literacy competence of graduate education students who
were completing the literature review for their dissertation. The researcher piloted the revised instrument with 22 participants at a public urban university that offers graduate teacher and special education to demographically-similar students. The pilot did not result in any changes to the instrument.

The Beile contains four content clusters: 1) identifying, evaluating, and selecting finding tools, 2) demonstrating knowledge of searching techniques, 3) evaluating and selecting sources, and 4) knowledge of legal and ethical practices. The Kuder Richardson 20 alpha coefficients for the content clusters were M = 2.63, SD = 1.34, K-R 20 = .45; M = 3.39, SD = 1.48, K-R 20 = .43; M = 2.91, SD = 1.42, K-R 20 = .33; and M = 3.04, SD = 1.06, K-R 20 = .17 respectively. The K-R 20 coefficient was .68 for the test.

The researcher received permission to use the *Beile Test of Information Literacy for Education* and modified some of the demographic questions for the purpose of his study. While O’Neill (2005) designed the instrument to assess the information literacy knowledge of undergraduate teacher education students, the instrument’s appropriateness for use with graduate students was verified fro use in this study by several content experts with strong backgrounds in information literacy and experience working with graduate teacher education students. The content experts indicated that the information literacy knowledge bases were the same whether students were in an undergraduate or graduate teacher education credential program.

The researcher developed the *Readiness to Integrate the Knowledge of Information Literacy into Teaching Survey* to measure the second dependent variable in this study: graduate teacher education students’ integration of information literacy into their classroom teaching (see Appendix B). The instrument was based on the *Big Six*
Skills Model for Information Problem Solving (1990), the ACRL Information Literacy Competency Standards for Higher Education (2000), and an adaptation of several instruments used by Bansavich (2005) that explored factors influencing pre-service teachers’ readiness to integrate technology into their instruction. The researcher had permission from the author to adapt the Bansavich instrument and used several experts in the content area of information literacy to provide content validity for the test items. The experts were academic and research librarians with over 10 years of experience providing information literacy instruction to graduate education students. One expert had 11 years of leadership responsibility for an academic library’s information literacy instructional program. The instrument contained 15 Likert-type questions and took approximately 10 minutes to complete. The researcher piloted this instrument with the same population used for the revised Beile instrument.

Procedures

The researcher requested permission from the dean of the School of Education and the Directors of Teacher and Special Education at one of the two private universities to survey graduate teacher education credential students in those programs. After an initial email and phone call to discuss his research, the researcher met with the Director of Special Education Programs at the second university and subsequently received permission to survey the graduate education students at the second university. The next step required the researcher to obtain permission from individual faculty members to survey students in their respective classes. The researcher then scheduled specific class times with each faculty member. Each instrument was pre-coded by the researcher for identification. Matching codes for each instrument began with 001. Data was collected
during the spring 2007 semester from several intact classes in each program using a convenience sample. The classes were held in the late afternoon, early evening, and on weekends.

The researcher began each meeting with participants by briefly introducing himself and explaining the purpose of his study and why he was interested in the topic. He also explained that by participating in the study, participants would be entered into a raffle to win one of two Ipod Nanos. Each participant provided contact information (name and email address) on a small ticket and returned it to the researcher. A letter explaining the purpose of the research, the Consent to be a Research Subject, and the Research Subjects’ Bill of Rights was given to each participant. The researcher instructed the participants to complete the Beile Test of Information Literacy for Education first and then the Readiness to Integrate the Knowledge of Information Literacy into Teaching Survey. The researcher answered any questions from participants and asked them to begin. The instruments were collected by the researcher as each participant completed them.

Shortly after the data was collected, the researcher’s administrative assistant randomly drew two tickets, and the winning participants were notified by email.

Data Analysis

Data were entered into SPSS (Version 15.0). Data collected from 15 participants registered in one university’s dual degree program, who were in these intact classes during data collection, were not analyzed since the students were undergraduates. One participant’s data, in these intact classes, was not analyzed because the participant did not complete one of the two research instruments.
The researcher conducted independent samples t-tests to determine statistical significance on the research questions examining the difference between credential graduate teacher education general and special education students’ knowledge of information literacy and their readiness to integrate those skills into their teaching (Research Questions 1-8). A one-way analysis of variance was conducted on the B-TILED to examine if participants differed depending on where they had received training. A one-way analysis of variance was also conducted to see if participants differed in their readiness depending on how much information literacy training they received. The researcher computed a Pearson product-moment correlation coefficient to determine the relationship between the participants’ score on the B-TILED and their self-rated readiness to integrate information literacy into their teaching.

The Researcher’s Role

The researcher for the current study is employed as a library administrator at an urban, private, university in northern California. The researcher has been an academic librarian for over 25 years and a senior level library administrator for 15 years. The researcher has worked in academic library reference departments and had major responsibility for information literacy instruction at the undergraduate and graduate levels in the social sciences and humanities. The researcher has had information literacy instruction responsibilities for professional schools of social work and education.

Summary

This descriptive study surveyed graduate teacher education students in both the special education and general education credential program to assess their knowledge of information literacy and their readiness to integrate information literacy into their
classroom teaching. Two instruments were administered and students were surveyed in intact classes. Permission was obtained from the coordinators of the programs and faculty and 126 students will completed the two instruments. The researcher conducted a one-way analysis of variance to determine any differences in information literacy knowledge or readiness to integrate into instruction based the training received. The researcher computed a Pearson product-moment correlation coefficient to determine the relationship between the participants’ knowledge of information literacy and their self-rated readiness to integrate information literacy knowledge into instruction.
CHAPTER IV

FINDINGS

This study examined the information literacy knowledge of general and special education teacher education students in graduate-level teacher preparation programs and their readiness to integrate their knowledge of information literacy into their classroom teaching. This descriptive study used a convenience sample of 126 teacher education students in intact classes enrolled in similar graduate teacher education programs at two private universities in northern California.

The study used the *Beile Test of Information Literacy for Education* (B-TILED) to assess participants’ information literacy knowledge. The researcher developed the Readiness to Integrate the Knowledge of Information Literacy into Teaching Survey to measure participants’ self-perception of their readiness to integrate information literacy knowledge into their classroom instruction.

The data were analyzed using independent samples *t*-tests on the two dependent variables: knowledge of information literacy as measured by the *Beile Test of Information Literacy for Education* and the *Readiness to Integrate the Knowledge of Information Literacy Knowledge into Teaching Survey*. The four independent variables were the graduate teacher education program area: general or special education; training or no training in information literacy; whether graduate teacher education students were teaching in low or higher socioeconomic schools; and the participants’ self-assessment of information literacy competence in database and Internet searching. The study also used a Pearson product-moment correlation coefficient to measure the relationship between
scores obtained on the B-TILED and the Readiness to Integrate the Knowledge of Information Literacy into Teaching Survey.

A score on the B-TILED of 57% or 13 of the 22 multiple-choice questions answered correctly indicates acceptable competence in information literacy knowledge. The highest possible score on the B-TILED is 100 (O’Neill, 2005). The Readiness Survey was a 15-item Likert-type instrument. The participants’ scores were summated to determine the level of readiness to integrate information literacy into classroom teaching. The highest possible summated score was 105.

Research Question One

Do graduate general education and special education students differ in their knowledge of information literacy? Table 1 presents the relevant descriptive statistics.

An independent-samples t test was conducted to determine if graduate general education and special education students differed in their knowledge of information literacy. The homogeneity of variance assumption was met, t = 1.51, p = .220. The results were not significant, t = -1.10, p = 0.27. Graduate special education students (n= 45) (M = 60.36, SD = 16.77) did not differ from general education students (M= 57.19, SD = 14.71) in their knowledge of information literacy. Based on their B-TILED scores, both groups demonstrated minimally acceptable competence in information literacy knowledge.

Research Question Two

Do graduate general education students and special education students differ in their readiness to integrate information literacy knowledge into instruction? Table 1 presents the relevant descriptive statistics.
An independent-samples $t$ test was conducted to determine if graduate general education and special education students differed in their readiness to integrate information literacy knowledge into instruction. The homogeneity of variance assumption was met $t = .246$, $p = .621$. The results were not significant, $t = 1.71$, $p = .27$. Graduate general education students ($n = 81$) ($M = 74.42$, $SD = 12.77$) did not differ from special education students ($n = 45$) ($M = 70.20$, $SD = 14.13$) in their readiness to integrate information literacy knowledge into instruction.

Table 1

Graduate general education and special education students’ knowledge of information literacy and readiness to integrate information literacy into instruction (B-TILED)

<table>
<thead>
<tr>
<th></th>
<th>Knowledge of information literacy</th>
<th>Readiness to integrate information literacy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$n$</td>
</tr>
<tr>
<td>General education students</td>
<td>57.19</td>
<td>81</td>
</tr>
<tr>
<td>Special education students</td>
<td>60.36</td>
<td>45</td>
</tr>
</tbody>
</table>
Research Question Three

Do graduate teacher education students who have training in the knowledge of information literacy differ in their knowledge of information literacy from those without training? Table 2 presents the relevant descriptive statistics.

The participants were grouped as having training or no training based on their response to a demographic item on the B-TILED which asked if participants received training in information literacy held in a university classroom, in the university library, or one-on-one with an academic librarian. Eighty-four had training and forty-two had no training.

An independent-samples $t$ test was conducted to evaluate the premise that graduate teacher education students who received training in the knowledge of information literacy differed in their information literacy knowledge from those without training. The homogeneity of variance assumption was met $t = .047$, $p = .829$. The test was not significant, $t = 1.24$, $p = .22$. Graduate teacher education students who had received training in any setting in the knowledge of information literacy did not score significantly higher in information literacy knowledge ($M = 59.52$, $SD = 15.74$) than those without training ($M = 55.90$, $SD = 15.74$). Even with training, graduate teacher education students achieved minimally acceptable competence on the B-TILED.

Research question three was further analyzed according to where the participants had received their information literacy training: in a university classroom, in the university library, or one-on-one with an academic librarian. Since respondents could check one or more of these settings, the $n$ differs for the three sub-analyses.
Table 2
Graduate teacher education students’ information literacy proficiency and readiness to integrate information literacy instruction (B-TILED)

<table>
<thead>
<tr>
<th>Information literacy training</th>
<th>Knowledge of information literacy</th>
<th>Readiness to integrate information literacy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Yes</td>
<td>59.52</td>
<td>15.74</td>
</tr>
<tr>
<td>No</td>
<td>55.90</td>
<td>15.74</td>
</tr>
<tr>
<td>University classroom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>instruction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>57.17</td>
<td>17.24</td>
</tr>
<tr>
<td>No</td>
<td>59.00</td>
<td>14.41</td>
</tr>
<tr>
<td>University library</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>59.32</td>
<td>16.34</td>
</tr>
<tr>
<td>No</td>
<td>56.94</td>
<td>14.25</td>
</tr>
<tr>
<td>One-on-one with</td>
<td></td>
<td></td>
</tr>
<tr>
<td>academic librarian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>56.39</td>
<td>16.83</td>
</tr>
<tr>
<td>No</td>
<td>58.64</td>
<td>15.30</td>
</tr>
</tbody>
</table>

*p<.05
An independent-samples $t$ test was conducted to evaluate whether participants who received training in the university classroom differed in their information literacy knowledge from those who did not receive university classroom training. The homogeneity of variance assumption was met $t = 1.43, p = .233$. The $t$ test was not significant, $t = .064, p = 0.52$. Graduate teacher education students who received information literacy training in the university classroom ($M = 57.17, SD = 17.24$) did not differ in information literacy knowledge from those who did not receive information literacy training in the classroom ($M= 59.00, SD = 14.41$).

An independent-samples $t$ test was conducted to evaluate whether participants who received training in the university library differed in their information literacy knowledge from those who did not receive training in the university library. The homogeneity of variance assumption was met $t = .194, p = .660$. The $t$ test was not significant, $t = 0.85, p = 0.40$. Graduate teacher education students who received training in the university library did not differ on the B-TILED ($M = 59.32, SD = 16.34$) from those who did not receive training in the library ($M = 56.94, SD = 14.25$).

An independent-samples $t$ test was conducted to evaluate whether participants who received training one-on-one with an academic librarian in the knowledge of information literacy differed in their information literacy knowledge from those who did not receive one-on-one training. The homogeneity of variance was met $t = .351, p = .555$. The test was not significant $t = 0.57, p = 0.57$. Graduate teacher education students who received one-on-one training with an academic librarian ($M = 56.39, SD = 16.83$) did not differ from those who did not receive one-on-one training ($M = 58.64, SD = 15.30$).
Research Question Four

Do graduate teacher education students who have training in the knowledge of information literacy differ in their readiness to integrate information literacy into instruction from those without training? Table 2 presents the relevant descriptive statistics.

The participants were grouped as having training or no training based on their response to a demographic item on the B-TILED which asked if participants received training in information literacy in a library instruction session held in a university classroom, in the university library, or one-on-one with an academic librarian.

An independent-samples $t$-test was conducted to evaluate the premise that training in the knowledge of information literacy affected the participants’ perceptions of their readiness to integrate information literacy knowledge into their teaching. The homogeneity of variance assumption was met $t = .136, p = .712$. The test was significant, $t = -2.52, p = 0.01$. Graduate teacher education students who received training in the knowledge of information literacy rated themselves higher on their readiness to integrate information literacy into their teaching ($M=75.14, SD = 12.68$) than those without training ($M = 68.88, SD = 14.01$).

Research question four was further analyzed by where the participants received their information literacy training: trained in a university classroom, trained in the university library, or trained one-on-one with an academic librarian. Since respondents could check one or more of these settings, the $n$ differs for the three sub-analyses.

An independent-samples $t$ test was conducted to evaluate whether participants who received training in a university classroom differed in their readiness to integrate
information literacy knowledge into their teaching from those who did not receive classroom training. The homogeneity of variance assumption was met $t = .399$, $p = .529$. The test was significant, $t = -2.99$, $p = 0.03$. Graduate teacher education students who received training in the university classroom ($M = 77.5$, $SD = 12.9$) self-reported that they were more ready to integrate their knowledge of information literacy into their teaching than those who did not receive training in the classroom ($M = 70.38$, $SD = 13.065$).

An independent-samples $t$ test was conducted to evaluate whether participants who received training in the university library differed in their readiness to integrate information literacy knowledge into their teaching from those who did not receive training in the university library. The homogeneity of variance assumption was met $t = .032$, $p = .858$. The test was significant, $t = -2.75$, $p = 0.007$. Graduate teacher education students who received training in the university library rated themselves higher on their readiness to integrate information literacy into their teaching ($M = 75.78$, $SD = 12.69$) than those without training in the university library ($M = 69.30$, $SD = 13.59$).

An independent samples $t$ test was conducted to evaluate the whether graduate teacher education students who received one-on-one training with an academic librarian in the knowledge of information literacy differed in their readiness to integrate information literacy knowledge into their teaching from those who did not receive one-on-one training with an academic librarian. The homogeneity of variance assumption was met $t = .038$, $p = .846$. The test was not significant, $t = -1.37$, $p = 0.17$. Graduate teacher education students who received one-on-one training with an academic librarian ($M = 77.06$, $SD = 12.66$) did not differ in their readiness to integrate information literacy into
their teaching than those who did not receive one-on-one training (M = 72.39, SD = 13.48).

*Research Question Five*

Do graduate teacher education students who teach in low socioeconomic schools differ in their knowledge of information literacy knowledge compared to those who teach in higher socioeconomic schools? Table 3 presents the relevant descriptive statistics.

Participants who self-reported that they taught in low or high socioeconomic schools were included in this analysis. The participants who reported teaching in middle socioeconomic schools (n = 36) and those who reported that they were not currently teaching (n = 14) were not included. An independent-samples *t* test was conducted to compare participants from low and high socioeconomic schools on their information literacy knowledge. The homogeneity of variance assumption was met *t* = .181, *p* = .672. The test was not significant, *t* = -1.09, *p* = .027. Participants who taught in higher socioeconomic schools did not differ on the B-TILED (M = 62.14, SD = 15.74) from those who taught in low socioeconomic schools (M = 57.89, SD = 14.83). Once again, the graduate teacher education students with training scored minimally acceptable confidence on the B-TILED.

*Research Question Six*

Do graduate teacher education students who teach in low socioeconomic schools differ in their readiness to integrate information literacy into their teaching compared to those who teach in higher socioeconomic schools? Table 3 presents the relevant descriptive statistics.
Participants who self-reported that they taught in low or high socioeconomic schools were included in this analysis. The participants who reported teaching in middle socioeconomic schools (n= 36) and those who reported that they were not currently teaching (n = 14) were not included. An independent-samples \( t \) test was conducted to compare participants from low and high socioeconomic schools on their readiness to integrate information literacy knowledge into their teaching. The homogeneity of variance assumption was met \( t = .164, p = .686 \). The test was not significant, \( t = 0.06, p = 0.95 \). Participants who taught in lower socioeconomic schools did not differ (M = 72.23, SD = 14.11) from those who taught in higher socioeconomic schools (M = 72.00, SD = 12.63).

Table 3

Low and high socioeconomic schools and information literacy knowledge and low and high socioeconomic schools readiness to integrate into instruction

<table>
<thead>
<tr>
<th></th>
<th>Knowledge of information literacy (B-TILED)</th>
<th>Readiness to integrate information literacy (Survey)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>High socioeconomic school</td>
<td>62.14</td>
<td>15.74</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low socioeconomic school</td>
<td>57.89</td>
<td>14.83</td>
</tr>
</tbody>
</table>
Research Question Seven

Do graduate teacher education students who self-rate their information literacy knowledge ability to search databases as high score higher on the Beile Test of Information Literacy for Education compared to those who rate themselves as low? Table 4 presents the relevant descriptive statistics.

Participants were asked on the B-TILED to self-rate their information literacy knowledge to search databases as excellent, good, average, or poor. The researcher analyzed this question for those who self-rated as excellent or average. Those who checked good (n = 61) and poor (n= 5) were omitted from the analyses.

An independent-samples \( t \) test was conducted to evaluate the premise that graduate teacher education students who self-rated their information literacy knowledge ability to search the databases as excellent would score higher on the B-TILED compared to those who self-rated their ability as average. Participants who self-rated their information literacy knowledge ability to search databases as excellent (M = 65.33, SD = 11.96) scored higher on the B-TILED than those who rated their ability as average (M = 57.79, SD = 14.89), however these results were not statistically significant, \( t = 1.90, p = .062 \). The graduate teacher education students scored minimally acceptable competence on the B-TILED. The homogeneity of variance assumption was met, \( t = .779, p = .381 \).

Research Question Eight

Do graduate teacher education students who self-rate their information literacy knowledge ability to search the Internet as high score higher on the Beile Test of Information Literacy for Education compared to those who rate themselves as low? Table 4 presents the relevant descriptive statistics.
Participants were asked on the B-TILED to self-rate their information literacy knowledge to search the Internet as excellent, good, average, or poor. The researcher analyzed this question for those who self-rated excellent or average. Those who checked good (n = 56) or poor (n = 1) were omitted from the analysis.

An independent-samples $t$ test was conducted to evaluate the premise that graduate teacher education students who self-rated their information literacy knowledge ability to search the Internet as excellent would score on the B-TILED compared to those who self-rated their ability as average. Participants who self-rated their information knowledge ability to search the Internet as excellent ($M = 60.75$, $SD = 16.24$) did not differ on the B-TILED from those who rated their ability as average ($M = 61.75$, $SD = 13.13$), $t = -.224$, $p = .824$. In fact, the graduate teacher education students who self-rated lower scored lower on the B-TILED. The homogeneity of variance assumption was met $t = 1.18$, $p = .294$.

Table 4

Self-rated ability to search databases and the Internet and scores on the B-TILED

<table>
<thead>
<tr>
<th>Self-rated ability</th>
<th>Databases</th>
<th>Internet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>Excellent</td>
<td>65.33</td>
<td>11.96</td>
</tr>
<tr>
<td>Average</td>
<td>57.79</td>
<td>14.89</td>
</tr>
</tbody>
</table>

Additional findings

The cut off score for minimal competence in information literacy on the B-TILED was 57% (O’Neil, 2005). The mean score for readiness was 72.91 out of 105 points. The
overall performance on the B-TILED (M=58.32) indicated minimum competence regardless of whether the participant had information literacy training or if the participant’s self-perception of his or her readiness was high. Seventy-four percent (n = 93) of the participants could not identify the difference between a book, a book chapter, a journal article, or an ERIC document. This is a key component of information literacy. Fifty-four percent of the participants (n = 68) did not correctly evaluate the legitimacy of a resource identified to use in the development of a lesson plan which has implications for classroom teaching. Forty-three percent of participants (n = 55) self-reported that they were not ready to integrate the following areas into their teaching: choosing software for its relevance and effectiveness; teaching students to distinguish between Web, book, journal, and government publication citations; search databases and library online catalogs to develop lesson plans; and teach students to present new knowledge and reflect on their learning.

A one-way analysis of variance was conducted on the B-TILED to examine if participants differed depending on where they had received training. The ANOVA was not significant, $F(2, 99) = 2.14, p = 0.12$. A one-way analysis of variance was conducted to examine if participants differed in their readiness depending on how much training they received in information literacy. The ANOVA was significant, $F(2, 99) = 4.96, p = 0.009$. The less training the participants had: no training (M=68.84), university classroom training (M =71.68), university classroom and university library training (M=78.48) the less ready they felt to integrate information literacy into their classroom teaching.

Finally, a Pearson product-moment correlation coefficient was calculated between the participants’ B-TILED scores and their self-ratings on the Readiness to Integrate the
Knowledge of Information Literacy into Teaching instrument. The correlation was not significant, r = 0.085 and indicated no linear relationship between participants’ scores on the B-TILED and their readiness scores.

Summary

Graduate general and special education students did not differ in their knowledge of information literacy as measured by the B-TILED. Both groups of students were at the cut-off score for minimally acceptable competence. Graduate teacher education students with training in information literacy did not differ in their knowledge of information literacy from those without training as measured by the B-TILED. Training in information literacy in the university classroom, the university library or one-on-one training with an academic librarian did not result in greater graduate teacher education students’ information literacy proficiency when compared to those without training. In addition, graduate teacher education students’ who received training in information literacy in the university classroom or the university library rated their readiness to integrate their knowledge of information literacy into their classroom instruction significantly higher than those without such training.

Graduate teacher education students who taught in higher socioeconomic schools were somewhat more proficient in information literacy knowledge compared to those who taught in lower socioeconomic schools, but there were no significant differences in either knowledge or their readiness to integrate information literacy into their classroom instruction.
Graduate general education and special education students who self-rated their ability to search databases or the Internet as excellent did not score higher on the B-TILED when compared to those who rated self-rated their ability as average.

Over 70% of the participants, independent of their B-TILED, score could not identify a basic bibliographic citation and over 50% could not evaluate the legitimacy of a resource to include in their lesson plan. Over 40% of the participants did not feel ready to integrate several major indicators of information literacy into their classroom teaching.

Finally, there was a very low correlation between graduate general and special education students’ scores on the B-TILED and their scores on the Readiness to Integrate the Knowledge of Information Literacy into Teaching Survey.
CHAPTER V
SUMMARY, DISCUSSION AND IMPLICATIONS

Information literacy is becoming a part of the consciousness of schools and school districts. School librarian/media specialists are frequently the catalysts, but classroom teachers and administrators, as well as parents and members of the community, are increasingly receptive to the message that children need a new skill set for the 21st century. It is not about computers and technology, it is about information. Today’s technology-based world requires that information literacy be fully integrated into the curriculum of our schools (Eisenberg, 2003). In their review of new literacies and standards for teacher education, Henderson and Scheffler (2003) reported that the proliferation of technology in public and private arenas underscores the importance for teacher education programs to ensure that teacher education candidates understand the complexity of information literacy. Ensuring that teacher candidates are information competent and are able to integrate these skills into their instruction is not an easy goal to achieve, but it is one that begins to address the problem.

This descriptive study examined the information literacy knowledge of graduate general and special education teacher education students and their readiness to integrate information literacy into their classroom instruction. This study used a convenience sample of 126 teacher education students in graduate-level teacher preparation programs at two private universities in northern California. A 35-item multiple choice knowledge instrument survey and a 15-item Likert-type readiness survey were used to collect the data.
There were two dependent variables in this study: (1) knowledge of information literacy which was defined as the ability to find, evaluate, and appropriately use information as measured by the *BEILE Test of Information Literacy Skills for Education* and (2) the teacher education students’ perceived readiness to integrate information literacy into instruction which was measured by the researcher-designed *Readiness to Integrate the Knowledge of Information Literacy into Teaching Survey*. The study included four independent variables. The first independent variable was the graduate teacher education program area: general education or special education. The second independent variable was whether the graduate teacher education students had training or no training in information literacy. The third independent variable in this study examined whether the graduate teacher education students were teaching in low or higher socio-economic schools. The fourth independent variable was the students’ self-rating of their information literacy competence to search databases and the Internet. According to the *Beile Test of Information Literacy for Education*, graduate general education and special education students have minimal competence in information literacy knowledge. Graduate teacher education students who received training in information literacy felt more ready to integrate information literacy into their teaching than those without training. The participants who received training in the university classroom and the university library felt significantly more ready to integrate information literacy into their teaching than those graduate teacher education students without training in these settings. Although graduate teacher education students strongly agreed that they were ready to integrate information literacy knowledge into their teaching, the participants did not perform particularly well on the B-TILED. The broad exposure to technology may give
graduate teacher education students a false sense of competence regarding their information literacy knowledge.

This study indicated no differences in information literacy knowledge or readiness to integrate information literacy into teaching based on the socioeconomic status of schools that employed the graduate teacher education students. There was no significant difference in how graduate teacher education students self-rated their ability to search databases and the Internet and their B-TILED score. The graduate teacher education students who self-rated their ability to search the Internet as excellent and average were at the minimally competent level in information literacy. The participants who self-rated their ability to search databases as excellent were competent in information literacy.

The findings in this study are summarized in this chapter according to their importance and their implications are discussed.

Summary and Discussion of Findings

Research Question One

Do graduate general education and special education students differ in their knowledge of information literacy?

The results of this study suggested that graduation general education and special education students do not differ in their knowledge of information literacy. In addition, both groups of participants were minimally acceptably competent in their knowledge of information literacy. The minimally acceptable competent score (M = 58.32) found in this study are similar to the results found by O’Neill (2005) where only 44% of the undergraduate teacher education students were minimally acceptably competent in information literacy knowledge and the overall mean score for the participants was 48.5
points. In the present study, forty-six percent of the 126 participants attained minimum acceptable competence. The cut-off score on the B-TILED was 57% or 13 of the 22 multiple choice questions answered correctly. Morner (1993) found similar results when she assessed the information literacy knowledge of doctoral education students where scores ranged from 14.6% to 82.9% correct. The average doctoral student answered only 50% of the items correctly. It appears that graduation teacher education students in this study do not have a greater knowledge of information literacy than undergraduate teacher education students.

Past research has suggested the need for teachers to have information literacy knowledge (Crouse & Kasbohm, 2004; Jacobson, 1988; Godfrey & Toifel, 1994, O’Hanlon, 1988). O’Hanlon (1988) found consensus among educators that a teacher who has strong competence in information literacy is better prepared to teach information literacy to students. Yet half of the education faculty surveyed felt that the current graduates of this Midwest teacher education program were unprepared to teach information literacy knowledge to their students. Most of the respondents viewed problem analysis, a key component of information literacy (ACRL, 2000), as the most important research skill that teachers needed. However, problem analysis was the least selected essential skill for future elementary schoolteachers to acquire. The majority of respondents also did not think problem analysis was an essential skill to formally teach in schools of education.

The results of this study suggested that many teacher education faculty still may not view information literacy as an important skill for graduate teacher education students to possess.
Research Question Two

Do graduate general teacher education and special education students differ in their readiness to integrate information literacy into instruction?

The results of this study suggested no statistically significant difference between graduate general education and special education students’ self-rated readiness to integrate information literacy into their classroom teaching. While both groups felt psychologically ready to integrate information literacy into their classroom instruction, their B-TILED scores were not high (general education, M = 57.19; special education, M = 60.36). In a study that assessed the information literacy of undergraduates, students thought they knew more about information literacy than they were able to demonstrate (Maughan, 2001). For example, 78% of political science seniors were unable to identify the best source for locating congressional publications; 66% could not identify what the Public Affairs Information Service is; and 60% were unable to identify the Statistical Abstract of the United States. Overall, graduating seniors had problems identifying the catalog information needed to locate a book in the library, determining whether or not a book had been checked out, limiting search results, and identifying the elements needed in a bibliographic citation.

Research Question Three

Do graduate teacher education students who have training in the knowledge of information literacy differ in their information literacy from those without training?

Graduate teacher education students who received training in information literacy in more than one setting did not score statistically significant higher on the B-TILED than those without training. O’Neill (2005) found that as students’ library instruction exposure
increased, their B-TILED scores decreased. She reported that this was most apparent in students with intensive exposure to library instruction. O’Neil suggested that this may be due to students, no matter how many training sessions they received, not having opportunities to integrate information literacy by completing assignments that required research. The mean score for undergraduate teacher education students who received no instruction was 54%. The mean score for those who received intensive instruction was 40%. While the results of this study and the O’Neil study suggested some lack of congruence with long-held beliefs about the value of training students in information literacy (Eisenberg, Lowe, & Spitzer, 2004; Grafstein, 2002; Grassian & Kaplowitz, 2001), the B-TILED has been validated as a measure of information literacy knowledge (O’Neill, 2005). This researcher consulted with several experts (each with many years of experience teaching information literacy) to confirm that the items on the B-TILED were measures of information literacy knowledge. O’Neil reported that Tunon (1999) also suggested education doctoral students’ increased exposure to library instruction did not translate into significantly better dissertation literature reviews. Despite these findings, past research (Beile, 2005; Nero, 2000; O’Hanlon, 1988, 1988, 1987; Sheehy, 2001) has recommended that information literacy be included in teacher education curricula to improve teachers’ information literacy proficiency in the classroom and to effectively meet teacher information needs.

This study found that while close to 67% of the participants (n= 84) in the study received information literacy training in various settings, their mean score (M = 59.52) suggested the same information literacy competence of those participants who were not trained (n = 42) (M = 55.90). Sixty-three percent of the study participants (n = 79) ranged
in age from 21-30. This generation of students has been defined as skilled in technology. Some have called them the *Net Generation* (Carlson, 2005; Geck, 2006; Tapscott, 1999). Many of these students may feel falsely competent in information literacy because they can text message, send instant messages, and watch videos on *YouTube.com*. It may be that while they have received training in information literacy, based on their perceived skills; they “tuned-out” the academic librarian and did not fully master the information literacy competencies. Recent findings from the Educational Testing Service (ETS) reported that only 53% of 6,300 students taking the ETS’s information and communication technology (ICT) literacy assessment could correctly judge the objectivity of a web site and only 65% could correctly judge the site’s authoritative ness. Only 40% of the students entered multiple search terms to narrow results and only 44% identified a statement that captured the demands of the assignment. Preliminary findings indicated that while college-age students can use technology, they do not necessarily know what to do with the content the technology provides (Schroeder, 2007).

While the many of the participants in this study had received training in information literacy, it is not known how many, as undergraduates, received assignments from faculty that required them to conduct library research. According to O’Neil (2005) Kunkel, Weaver, and Cook (1996) suggested that it is not the number or frequency of library instruction sessions that best predict test scores, but the number of opportunities the students have to complete assignments that requires library research. Many graduate teacher programs require research papers as a part of student coursework, but as Leckie (1996) suggested, students do not conceive of research in the same way as faculty and are frequently found in the library desperately seeking citations. She recommended that
faculty take more responsibility for teaching information-retrieval skills in their courses which will assist in developing the students’ information literacy knowledge.

Arp and Woodward (2003) observed that many school librarian/media specialists have worked with students who reportedly received excellent instruction but still did not know their way around a library. They wondered why students seemed to have learned so little during the immediate prior school year. After discussions with other school librarian/media specialist from K-12 schools, it was clear that information literacy concepts had been presented. The researchers questioned why students were unable to apply what they had learned in one library setting to another. They suggested that students forget because information literacy is not a set of discrete declarative skills that can be taught and internalized by the learner. As with critical thinking skills, Arp and Woodward suggested that information literacy must be taught and practiced in a multiple number of ways and in a variety of settings. Students need to have skills that will help them determine strategies from one information system to the next or from one Internet site to the next. Information literate students are products of well-thought information literacy curricula that highlighted a process approach, course-integrated instruction, inquiry based learning, and collaboration between teachers and librarians.

Finally, academic librarians may not be teaching aspects of information literacy that capture what teacher education students should know to demonstrate information literacy in the content domain of education. However, graduate teacher education students in this study, who were pursuing the master’s degree and may enroll in a doctoral program, will need to be competent in information literacy to succeed in doctoral studies (Morner, 1993).
Research Question Four

Do graduate teacher education students who have training in the knowledge of information literacy differ in their readiness to integrate information literacy into instruction from those without training?

The results of this study suggested that graduate teacher education students who received training in the knowledge of information literacy felt more ready to integrate information literacy into their teaching than those without training. Graduate teacher education students who received training in the knowledge of information literacy in the university classroom and in the university library felt significantly more ready to integrate information literacy into their teaching than those without training in these settings. The majority of the participants strongly agreed that they were ready to teach students to construct and implement effective search strategies, discuss with students how to find a variety of information resources, and teach students the difference between primary and secondary sources. Several studies and reports support these findings (Barrett, 2005; Beile, 2002; Cahoy, 2004; Dickinson, 2006; Malenfant & Demers, 2003). Information literacy training appears to increase the students’ self-perception that they understand the basic tenets of information literacy and can integrate those tenets into their teaching.

The present study suggested that training in the university classroom, which is frequently course-related, may increase graduate teacher education students’ feelings of self-efficacy. Field (2006) found similar results. Graduate teacher education students, in the current study who had training information literacy felt more confident regarding their knowledge of information literacy. However, based on their B-TILED scores, they
achieved a minimally acceptable level of knowledge. The overall B-TILED scores, with a 57% cut off score for information literacy competence (O’Neil, 2005), were (M = 57.19) for the general education students and (M = 60.36) for special education students. Once again, sixty-three percent of the study participants (n = 79) ranged in aged from 21-30. This generation of students has been defined as proficient in technological skills (Carlson, 2005; Fields, 2006; Geck, 2006; Tapscott, 1999) and may feel falsely competent in their readiness to integrate information literacy into their classroom teaching.

Research Question Five

Do graduate teacher education students who teach in low socioeconomic schools differ in their knowledge of information literacy compared to those who teach in higher socioeconomic schools?

The results of this study suggested that there was no statistically significant difference in information literacy knowledge between graduate teacher education students who taught in low socioeconomic schools and those that taught in higher socioeconomic schools. However, those participants who taught in higher socioeconomic schools did perform slightly better (M = 62.14) compared to those who taught in low socioeconomic schools (M = 57.89). In the context of the digital divide, it may be that the participants teaching in the higher socioeconomic schools had more access to technology and web resources than those participants teaching in lower socioeconomic schools and therefore achieved slightly higher scores on the B-TILED. Valadez and Duran’s (2007) research re-confirmed the digital divide between high SES and low SES schools and the use of the computer and the Internet by classroom teachers. The results of their study
suggested that teachers in higher SES schools had more access to computers and the Internet and more frequently assigned computer work to students than teachers with less access. Research that explored digital equity in education found that students in rural schools or schools with higher numbers of African American students were less likely to have access to computers. The researcher suggested that in states where pre-service teachers must meet standards that incorporate technology requirements to receive their teaching credential, computer use was higher (Becker, 2006). Another factor may be the role that gender plays in the digital divide. Seventy-three percent of the participants in this study were female and 65% of them were teaching in urban or inner city schools.

According to Chen and Price (2006), the digital divide is related to factors such as income, race, and parent education. Children from low income families are less likely to have access to computers in their homes or schools. Ching, Basham, and Chang (2005) reported that income is not the only factor in the digital divide. Research conducted over the past 20 years indicates a significant gender disparity as well. Girls do not enroll in as many computer courses at school, spend less time on computers at home, attend fewer computer camps, and are less likely to choose majors in computer science or related fields. The researchers found that male students from higher family income levels who had access to computers in the home before the age of 10 tended to use the full spectrum of technology more often than females with similar backgrounds.

Research Question Six

Do graduate teacher education students who teach in low socioeconomic schools differ in their readiness to integrate information literacy into instruction compared to those who teach in higher socioeconomic schools?
The results of this study suggested no statistically significant difference in readiness between graduate teacher education students who taught in low socioeconomic schools and those who taught in higher socioeconomic schools. Chen and Price (2006) in a similar study also found no statistically significant differences based on the socioeconomic status of the school where teachers taught and the teachers’ readiness to use computers in the classroom. Many teachers who teach in inner city schools are not equipped with the computer skills needed to successfully apply and integrate technology in their classrooms (Henricks, Peterson, Riel, & Schwarz, 2000). Graduate teacher education students in this study felt ready overall to integrate information literacy into their teaching, but many felt less ready to choose software for its relevance and effectiveness, a finding similar to those in the Riel et al. study. This study suggests that teacher educators and academic and research librarians may need to underscore the connection and differences between technology literacy and information literacy.

*Research Question 7*

Do graduate teacher education students who self-rate their information literacy knowledge ability to search databases as high score higher on the *Beile Test of Information Literacy for Education* compared to those who rate themselves as low?

The results of this study suggested that although graduate teacher education students who self-rated their ability to search databases as excellent scored higher on the B-TILED (M = 65.33) than those graduate teacher education students who self-rated their ability as average (M = 57.79), this difference was not statistically significant. However, the participants who self-rated their ability as excellent, based on their B-TILED scores, were considered competent in information literacy. It may be that some graduate teacher
education students who have had training in information literacy feel more confident in their ability to search databases (as with their self-rated readiness to integrate) and, as suggested above, think that their comfort level with aspects of technology will transfer to searching databases to find scholarly articles to complete course assignments. However, unlike many search engines that offer easy, menu driven search prompts, databases can be very complicated to search and often have different and/or confusing search protocols. This study suggests that some participants appeared to be making the cognitive connections between the information literacy training they received and searching databases. This finding is similar to results of a recent study (Knight, 2006) that developed rubrics to assess information literacy and the students’ ability to effectively use library databases and web resources. The author found that rubrics can provide a reliable and objective method for analyzing students’ information literacy competence when compared to their academic work. Knight recommended the importance of students being able to critically review sources and demonstrate the ability to distinguish between popular and scholarly materials. The student work product is a useful measure of the role of information literacy in higher education.

The results of this study suggest that graduate teacher education students who self-rated themselves as average may be a bit more intuitive about their information literacy knowledge. The B-TILED score for these participants was at the cut off score of 57.79. These participants may have made the cognitive distinction that the ability to search databases effectively is different from searching Yahoo or Google. Recent authors have supported the importance of information literacy as a key factor in helping students
and faculty to distinguish between scholarly databases and generalized search engines like Google (Hisle, 2005; Mann, 2005; Walker, 2006).

**Research Question Eight**

Do graduate teacher education students who self-rate their information literacy knowledge ability to search the Internet as high score higher on the *Beile Test of Information Literacy for Education* compared to those who rate themselves as low?

While there was no significant difference on the B-TILED between graduate teacher education students who self-rated their ability to search the Internet as excellent compared to those who self-rated their ability as average, both groups of participants, according to their B-TILED score, were minimally competent in information literacy. The participants training in information literacy may have made them feel more psychologically confident in their ability to search the Internet. In addition, the participants are defined (based on their age) as members of the Net Generation (Carlson, 2005; Fields, 2006; Geck, 2006; Tapscott, 1999) where technology (the Internet, mobile phone, iPod, instant messaging, etc) has become an important part in the way they learn and communicate.

In an overview of information literacy knowledge and the Internet, Buschman and Warner (2005) presented similar findings and questions raised by this study. Librarians are finally beginning to focus on some of the problems associated with student academic information seeking on the Internet. Some feel that student reliance on the Internet as the primary research tool has diminished the quality and rigor of student projects and reduced students’ competence in searching traditional print resources and library databases.

Hoctor (2005) suggested that searching the Internet is a common self-taught practice but
students do not know how to find or use the capabilities of various search engines and they do not have the information literacy proficiency to perform an effective search.

While the use of the Internet has increased substantially in K-12, the Internet does not necessarily support the student’s learning process. The Internet is a tool that may play a role in the learning processes of students in certain conditions. While the Internet provides access to a great deal of information and is an attractive resource to children, the Internet was not initially designed for use in educational settings. The Internet must have the same requirements established for other learning tools at school. Students need training to help them evaluate resources found on the Internet, develop appropriate search strategies, and effectively use the information found. The authors suggested that future research should focus on how the use of the Internet in education can contribute to the development of deep and meaningful knowledge (Kuiper, Terwel, & Volman, 2005).

The influence of technology and the Internet may have resulted in graduate teacher education students feeling more confident about their information literacy knowledge and their readiness to integrate that knowledge into their teaching. This confidence was not demonstrated cognitively as their average B-TILED score (M = 58.32) was just above the minimally acceptable competence score of 57. A second factor may be that the information literacy training that the graduate teacher education students received may not have emphasized the indicators that graduate teacher education students need to be information competent. However, these graduate teacher education students may be responsible for teaching information literacy knowledge, particularly those who are teaching in low socioeconomic schools. It is highly unlikely that they will have school librarian/media specialists working in their schools or that the schools will have
sufficient access to technology. These factors may result in the digital divide in urban and poor school systems continuing for the near future.

The results of this study indicated a low correlation between graduate teacher education students’ readiness to integrate information literacy knowledge into their teaching compared to their B-TILED scores. The graduate teacher educations students who strongly agreed that they were ready to integrate information literacy into their teaching scored low on the B-TILED. Those students who felt less ready to integrate information literacy into their teaching scored slightly higher on the B-TILED.

Maughan (2001), in a study that assessed the information literacy of undergraduates over a five year period, found that on a four-point scale of from excellent to poor, half to three-quarters of the respondents self-rated their skills as either excellent or pretty good. The library’s instruction coordinator compared students’ self-rating of competency with their actual scores on questions designed to measure their library and information literacy skills and found that between 35 to 81% of the respondents actually received poor or failing grades with a cut score set at 65%. The researcher concluded that students think they know more about accessing information and conducting research than they are able to demonstrate when tested. Ren (2000) found that students’ self-efficacy in electronic information searching improved after library instruction. The increase was suggested to be related to the students’ attitudes, emotional experiences, and search performance. Given the conclusions of the Ren study, perhaps the graduate teacher education students in the current study who self-rated their readiness to integrate information literacy into their teaching as low but who scored high on the B-TILED were not as self-efficacious based on their past experiences with information literacy training.
or conducting research in the university library. These students might not have much training in information literacy, found the training not useful, or had been taught by academic librarians with poor teaching skills.

**Conclusions**

Based on the results of the current study, academic and research librarians may need to rethink their information literacy training efforts for graduate teacher education students. The majority of graduate teacher education students in this study had some type of information literacy training but they did not demonstrate competence in information literacy based on their B-TILED scores. Teacher educators should not assume that graduate education students are information literacy competent or prepared to help students enrolled in urban or poorer school districts to develop these important life-long learning skills. Stronger collaborative teaching partnerships may need to be established between education faculty and academic and research librarians to improve the information literacy knowledge of graduate teacher education students.

Finally, based on the demographics of the participants in this study, graduate teacher education programs at majority institutions may want to increase efforts to recruit more ethnically diverse students into graduate teacher education programs.

**Limitations**

This study has several limitations. Sixty-four percent of the participants were graduate general education students compared to 37% who were graduate special education students. The difference in sub-sample size demographics may limit the generalization of study findings to other graduate general and special education students. A second limitation may be that the sample was drawn from intact groups from two
private universities. Participants from public universities may have different demographics of age and ethnic diversity. There may be some question that the B-TILED accurately assesses the information literacy competence required by graduate teacher education students to integrate information literacy into their classroom teaching. The B-TILED may measure overall academic information literacy competence rather than possible aspects of information literacy that are unique to teaching. Participants were surveyed in late afternoon or early evening. In some cases, participants came to class after teaching all day and it is possible that they were not mentally ready to respond to a survey. Finally, the researcher developed Readiness to Integrate the Knowledge of Information Literacy into Teaching Survey required the participants to self-rate their readiness. The participants may have been uncomfortable self-rating themselves low as it may have implied that they were not adequately prepared to be in the classroom. Self-ratings can depend on one’s feelings at a given time. Some participants may not have understood the information literacy indicators used to develop the instrument.

Implications

Implications for Practice

Although access to technology in public schools has improved, the digital divide is still an issue for many poor and urban school systems. This digital divide limits the opportunity that some graduate teacher education students have to integrate technology into their classroom teaching. As a result, the digital divide may partially explain why they feel less ready to integrate technology into their classrooms (Bansavich, 2005). The current study found that graduate teacher education students have minimal competence in information literacy, but that they feel psychology prepared to integrate information
literacy into their teaching. These findings suggest a disconnect that teacher educators and academic librarians may be able to address. Faculty in teacher education programs may need to place stronger emphasis in the teacher education curriculum on information literacy. Collaborative work should be done with academic and research librarians to plan new courses and review current courses to ensure that information literacy is integrated across the teacher education curricula. Team teaching with academic and research librarians may provide increased opportunities to connect information literacy knowledge to professional teaching standards and certification.

Academic and research librarians may need to consider changing their objectives for information literacy instruction when working with graduate teacher education students. Very few participants in this study received one-on-one training with an academic librarian. Although this was not the case in the current study, many academic and research librarians anecdotally report the value of this type of information literacy training. Perhaps academic and research librarians should promote one-on-one training and develop clear connections to student research topics and their major. More consideration may need to be given to content specific information literacy instruction. Connections should be made to the importance of integrating information literacy into classroom teaching and secondly, for teachers personal professional learning. It is recommended that academic and research librarians continue to develop instruments that will better assess the learning outcomes of information literacy instruction and make stronger correlations to the academic and professional success of graduate teacher education students who teach in schools still facing the digital divide.
Implications for Future Research

The findings of this study have implications for future research exploring the information literacy competence of graduate teacher education students. The study could be replicated with a larger, more ethnically diverse sample. Consideration could be given to include a public university graduate teacher program to confirm the findings in this study and further test the B-TILED and the readiness survey. Future research could include an experimental design study to compare graduate teacher education students who receive generic training in information literacy knowledge compared graduate teacher education students who receive content specific (education) training on their information literacy knowledge. Further research could investigate the low correlation between information literacy knowledge and readiness to integrate information literacy into classroom teaching. Finally, future research could explore the efficacy of providing one-on-one information literacy training.

Summary

Graduate general education and special education students demonstrated minimal competence in information literacy and may not be able to integrate information literacy in to their academic work or in their classroom teaching. Graduate teacher education programs should consider including stronger components of information literacy in their curricula. Academic and research librarian should establish stronger collaborative teaching relationships with teacher education faculty to support the information literacy competence of graduate teacher education students. In conclusion, academic and research librarians may need to re-think the information
literacy instruction provided to graduate teacher education students to improve the students’ competence in education specific aspects of information literacy.
REFERENCES


Appendix A

Beile Test of Information Literacy for Education (B-TILED)

The library is gathering information to evaluate the effectiveness of its instruction program. This questionnaire consists of demographic questions and a library and information skills quiz.

1. Overall, how would you rate your ability to search library databases to find information?
   a. excellent
   b. good
   c. average
   d. poor

2. Overall, how would you rate your ability to search the Internet to find information?
   a. excellent
   b. good
   c. average
   d. poor

Please indicate whether you have attended any of the following since you began your studies at USF.

3. Have you attended a tour or physical orientation of the library?
   a. yes
   b. no
   c. don’t know

4. Have you attended a library instruction session held in your classroom?
   a. yes
   b. no
   c. don’t know

5. Have you attended a library instruction session held in the library?
   a. yes
   b. no
   c. don’t know

6. Have you had one on one intensive instruction with a librarian?
   a. yes
   b. no
   c. don’t know

7. Which of the following characteristics best indicates scholarly research?
   a. available in an academic library
b. indexed by ERIC
c. reviewed by experts for publication
d. written by university faculty

8. Your professor has assigned a paper on the whole language movement. You are not familiar with the topic, so you decide to read a brief history and summary about it. Which of the following sources would be best?
   a. a book on the topic, such as *Perspectives on whole language learning: A case study*
b. a general encyclopedia, such as *Encyclopedia Britannica*
c. an article on the topic, such as “Whole language in the classroom: A student teacher’s perspective.”
d. an education encyclopedia, such as *Encyclopedia of Education*

9. Research or periodical databases are designed to include items based on which of the following criteria?
   a. found on the Internet
   b. not found on the Internet
   c. owned by your library
   d. relevant subject matter

10. ERIC is the most appropriate database to search to locate:
    a. education article citations and documents
    b. education publications from 1877 to current
    c. full-text education articles
    d. US Department of Education statistics

11. Most research and periodical databases have basic and advanced searching interfaces. Which of the following can you do ONLY in advanced searching?
    a. add Boolean or search connectors between terms
    b. enter multiple search terms
    c. search by keyword
    d. search multiple terms by field

12. Research studies in education are generally first communicated through:
    a. books published by education associations
    b. education encyclopedia entries
    c. newsletters of education associations
    d. professional conferences and journal articles

13. You have been assigned to write a short class paper on effective instruction techniques for teaching English as a Second Language (ESL) students. Your professor indicated three recent scholarly sources would be sufficient. Which strategy is best to locate items?
    a. search a general academic and an education database for journal articles
b. search an education database for journal articles  
c. search the library catalog for books  
d. search the library catalog for encyclopedias

14. Select the set of search terms that best represent the main concepts in the following:  
What are the health risks associated with the use of drug therapy for hyperactive students?  
a. drug therapy, health risks, hyperactivity  
b. drug therapy, health risks, students  
c. drug therapy, hyperactivity, students  
d. drugs, hyperactivity, therapy

15. Select the set that best represents synonyms and related terms for the concept “college students.”  
a. colleges, universities, community colleges. . .  
b. Gen X, students, undergraduates. . .  
c. graduate students, freshmen, sophomores. . .  
d. university, adult learners, educational attendees. . .

16. While researching a paper on character education, you find that it also sometimes called values education or moral education. You decide to look for information on the subject in a research database, and to save time you write a search statement that includes all three terms. Which of the following is the best example to use when you have fairly synonymous terms and it does not matter which of the terms is found in the record?  
a. character and values and moral  
b. character or values or moral  
c. character, values and moral  
d. character, values or moral

17. You are using a research database that uses an asterisk (*) as its truncation symbol. When you type in read* you would retrieve records that contained which of the following words?  
a. examine, peruse, reader, reading  
b. peruse, read, reader, reading  
c. read, reader, reads, readmit  
d. read, reader, reading, reapply

18. You have a class assignment to investigate how group work impacts student learning. A keyword search in ERIC on “group work” has returned over 600 items. To narrow your search, which of the following steps would you next perform?  
a. add “impacts” as a keyword  
b. add “student learning” as a keyword  
c. limit search results by date
d. limit search results by publication type

19. The following citation is for:
   a. a book
   b. a chapter in a book
   c. a journal article
   d. an ERIC document

20. Your professor suggested you read a particular article and gave you the following citation:
Which of the following would you type into the library’s catalog to locate the actual article?
   a. author search: Shayer
   b. journal title search: Learning and Instruction
   c. journal title search: Not just Piaget, not just Vygotsky
   d. subject search: Piaget and Vygotsky

21. The following item was retrieved from an ERIC database search. What kind of source is it?
Title: Pre-service Elementary Teachers’ Self-Efficacy Beliefs
Author(s): Cakiroglu, Jale; Boone, William J.
Publication Year: 2001
Abstract: The purpose of this study was to examine pre-service elementary teachers’ self-efficacy beliefs in teaching science.
Notes: Presented at the Annual Meeting of the American Educational Research Association (Seattle, WA, April 10-14, 2001)
Number of Pages: 24
ERIC Number: ED453084
   a. a book
   b. a book chapter
   c. a conference paper
   d. a journal article

22. Using the result from an Internet search engine, who is the “owner” of this Web site?
State policies on planning, funding and standards. Does the state have technology requirements for students? http://www.edweek.org/reports/tc98/states/fl.htm
   a. business or commercial entity
   b. college or university
   c. other organization
While developing a lesson plan on the U.S. legislative system, you find the following story on the Internet.

**Congress Launches National Congress-Awareness Week**

WASHINGTON, DC – Hoping to counter ignorance of the national legislative body among U.S. citizens, congressional leaders named the first week in August National Congress Awareness Week. “This special week is designed to call attention to America’s very important federal lawmaking body.” Speaker of the House Dennis Hastert said, The festivities will kick off with a 10-mile Walk for Congress Awareness.

The item is from a newspaper Web site, which states it is “America’s Finest News Source.” Given this, the following action is in order.

a. you can use the story as it’s obviously from a reputable news source
b. you decide to investigate the reputation of the publisher by looking at their Web site
c. you decide to investigate the reputation of the publisher by looking at other Web sites
d. you should not use the story because Web information is not always trustworthy

24. Based on the following paragraph, which sentence should be cited?

(1) Technology use in the schools is often characterized as a potentially dehumanizing force. (2) Perhaps the fear that the virtual world may lead to passivity and isolation, at the expense of literal social interactions, is valid. (3) Certainly, educators must ask which uses of technology results in increased learning and a better quality of life. (4) To address these issues, Hunter has proposed that students work in groups with the computer peripheral to the group and the teacher acting as facilitator.

a. 1  
b. 2  
c. 3  
d. 4

25. When is it ethical to use the ideas of another person in a research paper?

a. it is never ethical to use someone else’s ideas  
b. only if you do not use their exact words  
c. only when you give them credit  
d. only when you receive their permission

26. You are planning an open house for your students’ parents. Browsing the Internet, you find the report *Child Safety on the Internet*, which is a U.S. Department of Education publication. If you distribute 30 copies of the report to parents at the open house, which of the following copyright choices is the proper action?

a. permission is not needed as the report is from a government agency
b. permission is not needed as the report was found on the Internet

c. permission is not needed as you are only distributing 30 copies

d. permission to distribute 30 copies of the report must be acquired

27. You have an assignment that requires you to use course management software to practice setting up a class grade book. Your school purchased the software and loaded it in the computer lab, but you have a difficult time getting to the lab due to work conflicts. A friend loans you the software and you load it on your computer. Is this legal?

a. no, because this action constitutes a violation of copyright

b. yes, because it is already freely available in the lab

c. yes, because it is education software and therefore able to be shared

d. yes, because your friend owns it and can share as he wants

28. Browsing a weekly news magazine, you come across an article that discusses the future of space exploration. As you are teaching this topic you decide to make copies of the article and share it with your class. Which of the following concepts makes it legally permissible to reproduce portions of works for educational purposes without permission?

a. copyright

b. fair use

c. freedom of information

d. intellectual freedom

29. Which of the following most closely describes the level you want to teach?

a. early childhood

b. elementary

c. middle school

d. high school

30. What is your student classification?

a. freshman

b. sophomore

c. junior

d. senior

31. How long have you been continuously enrolled at USF?

a. less than 1 year

b. 1 to 2 years

c. 3 to 4 years

d. more than 4 years

32. Have you ever attended another university or college?

a. yes (go to question 33)

b. no (go to question 34)
33. How long ago did you attend another university or college?
   a. 0-1 year
   b. 2-3 years
   c. 4-5 years
   d. more than 5 years

34. What is your gender?
   a. male
   b. female

35. Please indicate those racial or ethnic groups that apply to you.
   (Select all that apply.)
   a. White or European American
   b. Hispanic or Latino
   c. Black or African American
   d. Asian or Asian American
   e. Other (write in on Scantron)

Thank you
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Appendix B
Readiness to Integrate the Knowledge of Information Literacy into Teaching Survey

Please check ( √ ) your area of specialization:

☐ General Education          ☐ Special Education

Please rate your level of readiness to complete the following activities by circling the most appropriate response.

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<tr>
<td>1. Teach students to construct and implement effective search strategies.</td>
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<td>2. Discuss with students how to get a variety of information sources.</td>
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<td>3. Teach students to determine the difference between primary and secondary sources.</td>
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<td>4. Use the Internet to retrieve information.</td>
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<td>5. Teach students to integrate new information into their own knowledge.</td>
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<td>6. Teach students to determine the accuracy, relevance, and comprehensiveness of information.</td>
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<td>7. Teach students to formulate questions based on their information needs.</td>
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<td>8. Construct and implement project-based learning lessons using a range of information and technology sources.</td>
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<td>9. Choose software for its relevance, effectiveness, alignment, and content standards.</td>
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<td>10. Teach students to distinguish between Web, book, journal, and government publication citations.</td>
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<td>11. Search databases and library online catalogs to develop lesson plans.</td>
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<td>12. Teach students to present their new knowledge with others and reflect on their learning.</td>
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<td>13. Teach students to identify and evaluate information related to their personal well-being.</td>
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<td>14. Teach students age-appropriate information literacy skills.</td>
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<td>15. Teach students ethical issues such as copyright, privacy, and security relating to information use.</td>
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Appendix C

Beile Test of Information Literacy for Education (B-TILED)/ACRL Performance Indicators

The library is gathering information to evaluate the effectiveness of its instruction program. This questionnaire consists of demographic questions and a library and information skills quiz.

1. Overall, how would you rate your ability to search library databases to find information?
   a. excellent
   b. good
   c. average
   d. poor

2. Overall, how would you rate your ability to search the Internet to find information?
   a. excellent
   b. good
   c. average
   d. poor

Please indicate whether you have attended any of the following since you began your studies at USF.

3. Have you attended a tour or physical orientation of the library?
   a. yes
   b. no
   c. don’t know

4. Have you attended a library instruction session held in your classroom?
   a. yes
   b. no
   c. don’t know

5. Have you attended a library instruction session held in the library?
   a. yes
   b. no
   c. don’t know

6. Have you had one-on-one intensive instruction with a librarian?
   a. yes
   b. no
   c. don’t know

7. Which of the following characteristics best indicates scholarly research?
   a. available in an academic library
b. indexed by ERIC  
c. reviewed by experts for publication  
d. written by university faculty

ACRL Performance Indicator 2.4.1.2

8. Your professor has assigned a paper on the whole language movement. You are not familiar with the topic, so you decide to read a brief history and summary about it. Which of the following sources would be best?

a. a book on the topic, such as *Perspectives on whole language learning: A case study*  
b. a general encyclopedia, such as *Encyclopedia Britannica*  
c. an article on the topic, such as “Whole language in the classroom: A student teacher’s perspective.”  
d. an education encyclopedia, such as *Encyclopedia of Education*

ACRL Performance Indicator 1.13.2

9. Research or periodical databases are designed to include items based on which of the following criteria?

a. found on the Internet  
b. not found on the Internet  
c. owned by your library  
d. relevant subject matter

ACRL Performance Indicator 2.1.3

10. ERIC is the most appropriate database to search to locate:

a. education article citations and documents  
b. education publications from 1877 to current  
c. full-text education articles  
d. US Department of Education statistics

ACRL Performance Indicator 2.3.2.3

11. Most research and periodical databases have basic and advanced searching interfaces. Which of the following can you do ONLY in advanced searching?

a. add Boolean or search connectors between terms  
b. enter multiple search terms  
c. search by keyword  
d. search multiple terms by field

ACRL Performance Indicator 2.2.5.2

12. Research studies in education are generally first communicated through:

a. books published by education associations
b. education encyclopedia entries
c. newsletters of education associations
d. professional conferences and journal articles

ACRL Performance Indicator 1.2.2.4

13. You have been assigned to write a short class paper on effective instruction techniques for teaching English as a Second Language (ESL) students. Your professor indicated three recent scholarly sources would be sufficient. Which strategy is best to locate items?
   a. search a general academic and an education database for journal articles
   b. search an education database for journal articles
   c. search the library catalog for books
   d. search the library catalog for encyclopedias

ACRL Performance Indicator 2.1.3.10

14. Select the set of search terms that best represent the main concepts in the following:
   What are the health risks associated with the use of drug therapy for hyperactive students?
   a. drug therapy, health risks, hyperactivity
   b. drug therapy, health risks, students
   c. drug therapy, hyperactivity, students
   d. drugs, hyperactivity, therapy

ACRL Performance Indicator 1.2.2.3

15. Select the set that best represents synonyms and related terms for the concept “college students.”
   a. colleges, universities, community colleges
   b. Gen X, students, undergraduates
   c. graduate students, freshmen, sophomores
   d. university, adult learners, educational attendees

ACRL Performance Indicator 2.2.2.3

16. While researching a paper on character education, you find that it also sometimes called values education or moral education. You decide to look for information on the subject in a research database, and to save time you write a search statement that includes all three terms. Which of the following is the best example to use when you have fairly synonymous terms and it does not matter which of the terms is found in the record?
   a. character and values and moral
   b. character or values or moral
   c. character, values and moral
17. You are using a research database that uses an asterisk (*) as its truncation symbol. When you type in *read* you would retrieve records that contained which of the following words?
   a. examine, peruse, reader, reading
   b. peruse, read, reader, reading
   c. read, reader, reads, readmit
   d. read, reader, reading, reapply

18. You have a class assignment to investigate how group work impacts student learning. A keyword search in ERIC on “group work” has returned over 600 items. To narrow your search, which of the following steps would you next perform?
   a. add “impacts” as a keyword
   b. add “student learning” as a keyword
   c. limit search results by date
   d. limit search results by publication type

19. The following citation is for:
    a. a book
    b. a chapter in a book
    c. a journal article
    d. an ERIC document

    Which of the following would you type into the library’s catalog to locate the actual article?
    a. author search: Shayer
    b. journal title search: *Learning and Instruction*
    c. journal title search: Not just Piaget, not just Vygotsky
21. The following item was retrieved from an ERIC database search. What kind of source is it?
Title: Pre-service Elementary Teachers’ Self-Efficacy Beliefs
Author(s): Cakiroglu, Jale; Boone, William J.
Publication Year: 2001
Abstract: The purpose of this study was to examine pre-service elementary teachers’ self-efficacy beliefs in teaching science.
Notes: Presented at the Annual Meeting of the American Educational Research Association (Seattle, WA, April 10-14, 2001)
Number of Pages: 24
ERIC Number: ED453084
   a. a book
   b. a book chapter
   c. a conference paper
   d. a journal article

22. Using the result from an Internet search engine, who is the “owner” of this Web site? State policies on planning, funding and standards. Does the state have technology requirements for students?
http://www.edweek.org/reports/tc98/states/fl.htm
   a. business or commercial entity
   b. college or university
   c. other organization
   d. state government agency

23. While developing a lesson plan on the U.S. legislative system, you find the following story on the Internet.
**Congress Launches National Congress Awareness Week**
WASHINGTON, DC –Hoping to counter ignorance of the national legislative body among U.S. citizens, congressional leaders named the first week in August National Congress Awareness Week. “This special week is designed to call attention to America’s very important federal lawmaking body.” Speaker of the House Dennis Hastert said, “The festivities will kick off with a 10-mile Walk for Congress Awareness.”
The item is from a newspaper Web site, which states it is “America’s Finest News Source.” Given this, the following action is in order.
   a. you can use the story as it’s obviously from a reputable news source
   b. you decide to investigate the reputation of the publisher by looking at their
Web site  
c. you decide to investigate the reputation of the publisher by looking at other Web sites  
d. you should not use the story because Web information is not always trustworthy

ACRL Performance Indicator 3.2.1.4

24. Based on the following paragraph, which sentence should be cited?  
(1)Technology use in the schools is often characterized as a potentially dehumanizing force. (2)Perhaps the fear that the virtual world may lead to passivity and isolation, at the expense of literal social interactions, is valid. (3) Certainly, educators must ask which uses of technology results in increased learning and a better quality of life. (4)To address these issues, Hunter has proposed that students work in groups with the computer peripheral to the group and the teacher acting as facilitator.
  a. 1
  b. 2
  c. 3
  d. 4

ACRL Performance Indicator 5.2.6

25. When is it ethical to use the ideas of another person in a research paper?  
  a. it is never ethical to use someone else’s ideas  
  b. only if you do not use their exact words  
  c. only when you give them credit  
  d. only when you receive their permission

ACRL Performance Indicator 5.1.4

26. You are planning an open house for your students’ parents. Browsing the Internet, you find the report *Child Safety on the Internet*, which is a U.S. Department of Education publication. If you distribute 30 copies of the report to parents at the open house, which of the following copyright choices is the proper action?  
  a. permission is not needed as the report is from a government agency  
  b. permission is not needed as the report was found on the Internet  
  c. permission is not needed as you are only distributing 30 copies  
  d. permission to distribute 30 copies of the report must be acquired

ACRL Performance Indicator 5.1.4

27. You have an assignment that requires you to use course management software to practice setting up a class grade book. Your school has purchased the software and loaded it in the computer lab, but you have a
difficult time getting to the lab due to work conflicts. A friend loans you the software and you load it on your computer. Is this legal?
   a. no, because this action constitutes a violation of copyright
   b. yes, because it is already freely available in the lab
   c. yes, because it is education software and therefore able to be shared
   d. yes, because your friend owns it and can share as he wants

ACRL Performance Indicator 5.2.5

28. Browsing a weekly news magazine, you come across an article that discusses the future of space exploration. As you are teaching this topic you decide to make copies of the article and share it with your class. Which of the following concepts makes it legally permissible to reproduce portions of works for educational purposes without permission?
   a. copyright
   b. fair use
   c. freedom of information
   d. intellectual freedom

ACRL Performance Indicator 5.1.4

29. Which of the following most closely describes the level you want to teach?
   a. early childhood
   b. elementary
   c. middle school
   d. high school

30. What is your student classification?
   a. freshman
   b. sophomore
   c. junior
   d. senior

31. How long have you been continuously enrolled at USF?
   a. less than 1 year
   b. 1 to 2 years
   c. 3 to 4 years
   d. more than 4 years

32. Have you ever attended another university or college?
   a. yes (go to question 33)
   b. no (go to question 34)

33. How long ago did you attend another university or college?
   a. 0-1 year
   b. 2-3 years
c. 4-5 years
d. more than 5 years

34. What is your gender?
a. male
b. female

35. Please indicate those racial or ethnic groups that apply to you.
   (Select all that apply.)
a. White or European American
b. Hispanic or Latino
c. Black or African American
d. Asian or Asian American
e. Other (write in on Scantron)

Thank you
Appendix D

ACRL Information Literacy Competency Standards for Higher Education
Approved by the Board of Directors of the Association of College and Research Libraries on January 18, 2000

Endorsed by the American Association for Higher Education (October 1999) and the Council of Independent Colleges (February 2004)

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The Information Literacy Competency Standards for Higher Education are available for downloading at: http://www.ala.org/acrl/acrlstan.html.

Five print copies of this publication are available per library without charge. Additional copies may be purchased from the Association of College and Research Libraries for $75.00 for a package of 25. Orders (along with check or money order made payable to Association of College and Research Libraries) should be sent to:

Association of College and Research Libraries
Attn: Info Lit Standards Fulfillment
50 East Huron Street
Chicago, IL 60611
Information Literacy
Competency Standards for
Higher Education

The Association of College and Research Libraries
A division of the American Library Association

Chicago, Illinois
Information Literacy Competency Standards for Higher Education

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Information Literacy Defined

Information literacy is a set of abilities requiring individuals to “recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.” Information literacy also is increasingly important in the contemporary environment of rapid technological change and proliferating information resources. Because of the escalating complexity of this environment, individuals are faced with diverse, abundant information choices—in their academic studies, in the workplace, and in their personal lives. Information is available through libraries, community resources, special interest organizations, media, and the Internet—and increasingly, information comes to individuals in unfiltered formats, raising questions about its authenticity, validity, and reliability. In addition, information is available through multiple media, including graphical, aural, and textual, and these pose new challenges for individuals in evaluating and understanding it. The uncertain quality and expanding quantity of information pose large challenges for society. The sheer abundance of information will not in itself create a more informed citizenry without a complementary cluster of abilities necessary to use information effectively.

Information literacy forms the basis for lifelong learning. It is common to all disciplines, to all learning environments, and to all levels of education. It enables learners to master content and extend their investigations, become more self-directed, and assume greater control over their own learning. An information literate individual is able to:

- Determine the extent of information needed
- Access the needed information effectively and efficiently
- Evaluate information and its sources critically
- Incorporate selected information into one's knowledge base
- Use information effectively to accomplish a specific purpose
- Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally

**Information Literacy and Information Technology**

Information literacy is related to information technology skills, but has broader implications for the individual, the educational system, and for society. Information technology skills enable an individual to use computers, software applications, databases, and other technologies to achieve a wide variety of academic, work-related, and personal goals. Information literate individuals necessarily develop some technology skills.

Information literacy, while showing significant overlap with information technology skills, is a distinct and broader area of competence. Increasingly, information technology skills are interwoven with, and support, information literacy. A 1999 report from the National Research Council promotes the concept of "fluency" with information technology and delineates several distinctions useful in understanding relationships among information literacy, computer literacy, and broader technological competence. The report notes that "computer literacy" is concerned with rote learning of specific hardware and software applications, while "fluency with technology" focuses on understanding the underlying concepts of technology and applying problem-solving and critical thinking to using technology. The report also discusses differences between information technology fluency and information literacy as it is understood in K-12 and higher education. Among these are information literacy's focus on content, communication, analysis, information searching, and evaluation; whereas information technology "fluency" focuses on a deep understanding of technology and graduated, increasingly skilled use of it.

"Fluency" with information technology may require more intellectual abilities than the rote learning of software and hardware associated with "computer literacy", but the focus is still on the technology itself. Information literacy, on the other hand, is an intellectual framework for understanding, finding, evaluating, and using information—activities which may be accomplished in part by fluency with information technology, in part by sound investigative methods, but most important, through critical discernment and reasoning. Information literacy initiates, sustains, and extends lifelong learning through abilities which may use technologies but are ultimately independent of them.

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Information Literacy and Higher Education

Developing lifelong learners is central to the mission of higher education institutions. By ensuring that individuals have the intellectual abilities of reasoning and critical thinking, and by helping them construct a framework for learning how to learn, colleges and universities provide the foundation for continued growth throughout their careers, as well as in their roles as informed citizens and members of communities. Information literacy is a key component of, and contributor to, lifelong learning. Information literacy competency extends learning beyond formal classroom settings and provides practice with self-directed investigations as individuals move into internships, first professional positions, and increasing responsibilities in all arenas of life. Because information literacy augments students’ competency with evaluating, managing, and using information, it is now considered by several regional and discipline-based accreditation associations as a key outcome for college students.

For students not on traditional campuses, information resources are often available through networks and other channels, and distributed learning technologies permit teaching and learning to occur when the teacher and the student are not in the same place at the same time. The challenge for those promoting information literacy in distance education courses is to develop a comparable range of experiences in learning about information resources as are offered on traditional campuses. Information literacy competencies for distance learning students should be comparable to those for “on campus” students.

Incorporating information literacy across curricula, in all programs and services, and throughout the administrative life of the university, requires the collaborative efforts of faculty, librarians, and administrators. Through lectures and by leading discussions, faculty establish the context for learning. Faculty also inspire students to explore the unknown, offer guidance on how best to fulfill information needs, and monitor students’ progress. Academic librarians coordinate the evaluation and selection of intellectual resources for programs and services; organize, and maintain collections and many points of access to information; and provide instruction to students and faculty who seek information. Administrators create opportunities for collaboration and staff development among faculty, librarians, and other professionals who initiate information literacy programs, lead in planning and budgeting for those programs, and provide ongoing resources to sustain them.

Information Literacy and Pedagogy

The Boyer Commission Report, Reinventing Undergraduate Education, recommends strategies that require the student to engage actively in “framing of a significant question or set of questions, the research or creative exploration to find answers, and the communications skills to convey
the results... Courses structured in such a way create student-centered learning environments where inquiry is the norm, problem solving becomes the focus, and thinking critically is part of the process. Such learning environments require information literacy competencies.

Gaining skills in information literacy multiplies the opportunities for students' self-directed learning, as they become engaged in using a wide variety of information sources to expand their knowledge, ask informed questions, and sharpen their critical thinking for still further self-directed learning. Achieving competency in information literacy requires an understanding that this cluster of abilities is not extraneous to the curriculum but is woven into the curriculum's content, structure, and sequence. This curricular integration also affords many possibilities for furthering the influence and impact of such student-centered teaching methods as problem-based learning, evidence-based learning, and inquiry learning. Guided by faculty and others in problem-based approaches, students reason about course content at a deeper level than is possible through the exclusive use of lectures and textbooks. To take fullest advantage of problem-based learning, students must often use thinking skills requiring them to become skilled users of information sources in many locations and formats, thereby increasing their responsibility for their own learning.

To obtain the information they seek for their investigations, individuals have many options. One is to utilize an information retrieval system, such as may be found in a library or in databases accessible by computer from any location. Another option is to select an appropriate investigative method for observing phenomena directly. For example, physicians, archeologists, and astronomers frequently depend upon physical examination to detect the presence of particular phenomena. In addition, mathematicians, chemists, and physicists often utilize technologies such as statistical software or simulators to create artificial conditions in which to observe and analyze the interaction of phenomena. As students progress through their undergraduate years and graduate programs, they need to have repeated opportunities for seeking, evaluating, and managing information gathered from multiple sources and discipline-specific research methods.

Use of the Standards

Information Literacy Competency Standards for Higher Education provides a framework for assessing the information literate individual. It also extends the work of the American Association of School Librarians Task Force on Information Literacy Standards, thereby providing higher education an opportunity to articulate its information literacy competencies with those of K-12 so that a continuum of expectations develops for students at all levels. The competencies presented here outline the process by which faculty, librarians and others pinpoint specific indicators that identify a student as information literate.
Students also will find the competencies useful, because they provide students with a framework for gaining control over how they interact with information in their environment. It will help to sensitize them to the need to develop a metacognitive approach to learning, making them conscious of the explicit actions required for gathering, analyzing, and using information. All students are expected to demonstrate all of the competencies described in this document, but not everyone will demonstrate them to the same level of proficiency or at the same speed.

Furthermore, some disciplines may place greater emphasis on the mastery of competencies at certain points in the process, and therefore certain competencies would receive greater weight than others in any rubric for measurement. Many of the competencies are likely to be performed recursively, in that the reflective and evaluative aspects included within each standard will require the student to return to an earlier point in the process, revise the information-seeking approach, and repeat the same steps.

To implement the standards fully, an institution should first review its mission and educational goals to determine how information literacy would improve learning and enhance the institution's effectiveness. To facilitate acceptance of the concept, faculty and staff development is also crucial.

**Information Literacy and Assessment**

In the following competencies, there are five standards and twenty-two performance indicators. The standards focus upon the needs of students in higher education at all levels. The standards also list a range of outcomes for assessing student progress toward information literacy. These outcomes serve as guidelines for faculty, librarians, and others in developing local methods for measuring student learning in the context of an institution's unique mission. In addition to assessing all students' basic information literacy skills, faculty and librarians should also work together to develop assessment instruments and strategies in the context of particular disciplines, as information literacy manifests itself in the specific understanding of the knowledge creation, scholarly activity, and publication processes found in those disciplines.

In implementing these standards, institutions need to recognize that different levels of thinking skills are associated with various learning outcomes—and therefore different instruments or methods are essential to assess those outcomes. For example, both "higher order" and "lower order" thinking skills, based on Bloom's Taxonomy of Educational Objectives, are evident throughout the outcomes detailed in this document. It is strongly suggested that assessment methods appropriate to the thinking skills associated with each outcome be identified as an integral part of the institution's implementation plan.
For example, the following outcomes illustrate "higher order" and "lower order" thinking skills:

"Lower Order" thinking skill:
Outcome 2.2.a. Identifies keywords, synonyms, and related terms for the information needed.

"Higher Order" thinking skill:
Outcome 3.3.b. Extends initial synthesis, when possible, to a higher level of abstraction to construct new hypotheses that may required additional information.

Faculty, librarians, and others will find that discussing assessment methods collaboratively is a very productive exercise in planning a systematic, comprehensive information literacy program. This assessment program should reach all students, pinpoint areas for further program development, and consolidate learning goals already achieved. It also should make explicit to the institution's constituencies how information literacy contributes to producing educated students and citizens.

Notes


3. Several key accrediting agencies concerned with information literacy are: The Middle States Commission on Higher Education (MSCHE), the Western Association of Schools and College (WASC), and the Southern Association of Colleges and Schools (SACS).

Standards, Performance Indicators, and Outcomes

Standard One

The information literate student determines the nature and extent of the information needed.

*Performance Indicators:*
1. The information literate student defines and articulates the need for information.

*Outcomes Include:*
   a. Confers with instructors and participates in class discussions, peer workgroups, and electronic discussions to identify a research topic, or other information need
   b. Develops a thesis statement and formulates questions based on the information need
   c. Explores general information sources to increase familiarity with the topic
   d. Defines or modifies the information need to achieve a manageable focus
   e. Identifies key concepts and terms that describe the information need
   f. Recognizes that existing information can be combined with original thought, experimentation, and/or analysis to produce new information

2. The information literate student identifies a variety of types and formats of potential sources for information.

*Outcomes Include:*
   a. Knows how information is formally and informally produced, organized, and disseminated
   b. Recognizes that knowledge can be organized into disciplines that influence the way information is accessed
   c. Identifies the value and differences of potential resources in a variety of formats (e.g., multimedia, database, website, data set, audio/visual, book)
   d. Identifies the purpose and audience of potential resources (e.g., popular vs. scholarly, current vs. historical)
   e. Differentiates between primary and secondary sources, recognizing how their use and importance vary with each discipline
   f. Realizes that information may need to be constructed with raw data from primary sources

3. The information literate student considers the costs and benefits of acquiring the needed information.
Outcomes Include:
   a. Determines the availability of needed information and makes decisions on broadening the information seeking process beyond local resources (e.g., interlibrary loan; using resources at other locations; obtaining images, videos, text, or sound)
   b. Considers the feasibility of acquiring a new language or skill (e.g., foreign or discipline-based) in order to gather needed information and to understand its context
   c. Defines a realistic overall plan and timeline to acquire the needed information

4. The information literate student reevaluates the nature and extent of the information need.

Outcomes Include:
   a. Reviews the initial information need to clarify, revise, or refine the question
   b. Describes criteria used to make information decisions and choices

**Standard Two**

The information literate student accesses needed information effectively and efficiently.

**Performance Indicators:**

1. The information literate student selects the most appropriate investigative methods or information retrieval systems for accessing the needed information.

Outcomes Include:
   a. Identifies appropriate investigative methods (e.g., laboratory experiment, simulation, fieldwork)
   b. Investigates benefits and applicability of various investigative methods
   c. Investigates the scope, content, and organization of information retrieval systems
   d. Selects efficient and effective approaches for accessing the information needed from the investigative method or information retrieval system

2. The information literate student constructs and implements effectively-designed search strategies.

Outcomes Include:
   a. Develops a research plan appropriate to the investigative method
   b. Identifies keywords, synonyms and related terms for the information needed
   c. Selects controlled vocabulary specific to the discipline or information retrieval source
d. Constructs a search strategy using appropriate commands for the information retrieval system selected (e.g., Boolean operators, truncation, and proximity for search engines; internal organizers such as indexes for books)
e. Implements the search strategy in various information retrieval systems using different user interfaces and search engines, with different command languages, protocols, and search parameters
f. Implements the search using investigative protocols appropriate to the discipline

3. The information literate student retrieves information online or in person using a variety of methods.
Outcomes include:
   a. Uses various search systems to retrieve information in a variety of formats
   b. Uses various classification schemes and other systems (e.g., call number systems or indexes) to locate information resources within the library or to identify specific sites for physical exploration
   c. Uses specialized online or in person services available at the institution to retrieve information needed (e.g., interlibrary loan/document delivery, professional associations, institutional research offices, community resources, experts and practitioners)
   d. Uses surveys, letters, interviews, and other forms of inquiry to retrieve primary information

4. The information literate student refines the search strategy if necessary.
Outcomes include:
   a. Assesses the quantity, quality, and relevance of the search results to determine whether alternative information retrieval systems or investigative methods should be utilized
   b. Identifies gaps in the information retrieved and determines if the search strategy should be revised
   c. Repeats the search using the revised strategy as necessary

5. The information literate student extracts, records, and manages the information and its sources.
Outcomes include:
   a. Selects among various technologies the most appropriate one for the task of extracting the needed information (e.g., copy/paste software functions, photocopier, scanner, audio/visual equipment, or exploratory instruments)
   b. Creates a system for organizing the information
   c. Differentiates between the types of sources cited and understands the elements and correct syntax of a citation for a wide range of resources
d. Records all pertinent citation information for future reference

e. Uses various technologies to manage the information selected and organized

**Standard Three**

The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.

**Performance Indicators:**
1. The information literate student summarizes the main ideas to be extracted from the information gathered.

**Outcomes Include:**
   a. Reads the text and selects main ideas
   b. Restates textual concepts in his/her own words and selects data accurately
   c. Identifies verbatim material that can be then appropriately quoted

2. The information literate student articulates and applies initial criteria for evaluating both the information and its sources.

**Outcomes Include:**
   a. Examines and compares information from various sources in order to evaluate reliability, validity, accuracy, authority, timeliness, and point of view or bias
   b. Analyzes the structure and logic of supporting arguments or methods
   c. Recognizes prejudice, deception, or manipulation
   d. Recognizes the cultural, physical, or other context within which the information was created and understands the impact of context on interpreting the information

3. The information literate student synthesizes main ideas to construct new concepts.

**Outcomes Include:**
   a. Recognizes interrelationships among concepts and combines them into potentially useful primary statements with supporting evidence
   b. Extends initial synthesis, when possible, at a higher level of abstraction to construct new hypotheses that may require additional information
   c. Utilizes computer and other technologies (e.g. spreadsheets, databases, multimedia, and audio or visual equipment) for studying the interaction of ideas and other phenomena

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4. The information literate student compares new knowledge with prior knowledge to determine the value added, contradictions, or other unique characteristics of the information.

Outcomes Include:
   a. Determines whether information satisfies the research or other information need
   b. Uses consciously selected criteria to determine whether the information contradicts or verifies information used from other sources
   c. Draws conclusions based upon information gathered
   d. Tests theories with discipline-appropriate techniques (e.g., simulators, experiments)
   e. Determines probable accuracy by questioning the source of the data, the limitations of the information gathering tools or strategies, and the reasonableness of the conclusions
   f. Integrates new information with previous information or knowledge
   g. Selects information that provides evidence for the topic

5. The information literate student determines whether the new knowledge has an impact on the individual's value system and takes steps to reconcile differences.

Outcomes Include:
   a. Investigates differing viewpoints encountered in the literature
   b. Determines whether to incorporate or reject viewpoints encountered

6. The information literate student validates understanding and interpretation of the information through discourse with other individuals, subject-area experts, and/or practitioners.

Outcomes Include:
   a. Participates in classroom and other discussions
   b. Participates in class-sponsored electronic communication forums designed to encourage discourse on the topic (e.g., e-mail, bulletin boards, chat rooms)
   c. Seeks expert opinion through a variety of mechanisms (e.g., interviews, e-mail, listservs)

7. The information literate student determines whether the initial query should be revised.

Outcomes Include:
   a. Determines if original information need has been satisfied or if additional information is needed
   b. Reviews search strategy and incorporates additional concepts as necessary
c. Reviews information retrieval sources used and expands to include others as needed

**Standard Four**

The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.

**Performance Indicators:**

1. The information literate student applies new and prior information to the planning and creation of a particular product or performance.

   **Outcomes Include:**
   
   a. Organizes the content in a manner that supports the purposes and format of the product or performance (e.g., outlines, drafts, storyboards)
   b. Articulates knowledge and skills transferred from prior experiences to planning and creating the product or performance
   c. Integrates the new and prior information, including quotations and paraphrasings, in a manner that supports the purposes of the product or performance
   d. Manipulates digital text, images, and data, as needed, transferring them from their original locations and formats to a new context

2. The information literate student revises the development process for the product or performance.

   **Outcomes Include:**
   
   a. Maintains a journal or log of activities related to the information seeking, evaluating, and communicating process
   b. Reflects on past successes, failures, and alternative strategies

3. The information literate student communicates the product or performance effectively to others.

   **Outcomes Include:**
   
   a. Chooses a communication medium and format that best supports the purposes of the product or performance and the intended audience
   b. Uses a range of information technology applications in creating the product or performance
   c. Incorporates principles of design and communication
   d. Communicates clearly and with a style that supports the purposes of the intended audience
Standard Five

The information literate student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.

Performance Indicators:
1. The information literate student understands many of the ethical, legal and socio-economic issues surrounding information and information technology.

Outcomes Include:
   a. Identifies and discusses issues related to privacy and security in both the print and electronic environments
   b. Identifies and discusses issues related to free vs. fee-based access to information
   c. Identifies and discusses issues related to censorship and freedom of speech
   d. Demonstrates an understanding of intellectual property, copyright, and fair use of copyrighted material

2. The information literate student follows laws, regulations, institutional policies, and etiquette related to the access and use of information resources.

Outcomes Include:
   a. Participates in electronic discussions following accepted practices (e.g. "Netiquette")
   b. Uses approved passwords and other forms of ID for access to information resources
   c. Complies with institutional policies on access to information resources
   d. Preserves the integrity of information resources, equipment, systems and facilities
   e. Legally obtains, stores, and disseminates text, data, images, or sounds
   f. Demonstrates an understanding of what constitutes plagiarism and does not represent work attributable to others as his/her own
   g. Demonstrates an understanding of institutional policies related to human subjects research

3. The information literate student acknowledges the use of information sources in communicating the product or performance.

Outcomes Include:
   a. Selects an appropriate documentation style and uses it consistently to cite sources
   b. Posts permission granted notices, as needed, for copyrighted material
Appendix I: Selected Information Literacy Initiatives

- In 1989 the American Library Association (ALA) Presidential Committee on Information Literacy issued a Final Report which defined four components of information literacy: the ability to recognize when information is needed and to locate, evaluate and use effectively the needed information. http://www.ala.org/ala/acrl/acrl-pubs/whitepapers/presidential.htm.

- In 1990, the National Forum on Information Literacy (NFIL) was founded as a response to the recommendations of the ALA Presidential Committee Final Report. NFIL is a "coalition of over 75 educational, business, and governmental organizations working to promote international and national awareness of the need for information literacy and encouraging activities leading to its acquisition." Forum members promote information literacy nationally, internationally, and within their own programs. http://www.infolit.org/index.html


- In 1998 the American Association of School Libraries (AASL) and the Association of Educational Communications and Technology (AECT) published Information Literacy Standards for Student Learning. The AASL/AECT standards detail competencies for students in K-12.

- Since 1989, in the absence of national standards, many states, school districts, state university systems, and local institutions have developed information literacy competency standards. http://www.fiu.edu/~library/ili/iliweb.html
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Citing the standards

**American Psychological Association (APA Style)**

*Online citation*

**Chicago Manual of Style**

*Online citation*

**Modern Language Association (MLA Style)**

*Online citation*
Appendix E
AASL/AECT Information Literacy Standards for Student Learning

INFORMATION LITERACY STANDARDS FOR STUDENT LEARNING

STANDARDS AND INDICATORS

Prepared by the
American Association of School Librarians
Association for Educational Communications and Technology
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Excerpt from Information Literacy Standards for Student Learning, published by the American Library Association. The full publication includes a chapter on the philosophy and the mission and goals of the information literacy standards, along with the following supporting material to illustrate how standards and indicators can be applied.

- Levels of Proficiency items for the indicators within each standard
- Standards in Action that provide examples of potential situations requiring information literacy for each standard
- Examples of Content-Area Standards for each standard

Information Power: Building Partnerships for Learning includes the full content of Information Literacy Standards for Student Learning with additional content designed to guide and support library media specialists’ efforts in three major areas: learning and teaching, information access, and program administration. It also shows how skills and strategies in collaboration, leadership, and technology support these efforts.
Introduction

Information Literacy Standards for Student Learning provides a conceptual framework and broad guidelines for describing the information literate student. The standards consist of three categories, nine standards, and twenty-nine indicators. The core learning outcomes that are most directly related to the services provided by school library media programs are found in the three standards and thirteen indicators in the "information literacy" category. The other two categories—three standards and seven indicators for "independent learning" and three standards and nine indicators for "social responsibility"—are grounded in information literacy but describe more general aspects of student learning to which school library media programs also make important contributions. Taken together, the categories, standards, and indicators describe the content and processes related to information that students must master to be considered information literate.

The standards and indicators are written at a general level so that library media specialists and others in individual states, districts, and sites can tailor the statements to meet local needs. These educators are the ones who know their student populations; their role is to apply these general statements in light of the developmental, cultural, and learning needs of all the students they serve. By offering broad guidelines for describing the information literate student, Information Literacy Standards for Student Learning provides a conceptual framework and supporting material for local efforts.

Information Literacy Standards
For Student Learning

INFORMATION LITERACY STANDARDS

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

The student who is information literate recognizes that having good information is central to meeting the opportunities and challenges of day-to-day living. That student knows when to seek information beyond his or her personal knowledge, how to frame questions that
will lead to the appropriate information, and where to seek that information. The student knows how to structure a search across a variety of sources and formats to locate the best information to meet a particular need.

**Indicators**

Indicator 1. Recognizes the need for information

Indicator 2. Recognizes that accurate and comprehensive information is the basis for intelligent decision making

Indicator 3. Formulates questions based on information needs

Indicator 4. Identifies a variety of potential sources of information

Indicator 5. Develops and uses successful strategies for locating information

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

The student who is information literate weighs information carefully and wisely to determine its quality. That student understands traditional and emerging principles for assessing the accuracy, validity, relevance, completeness, and impartiality of information. The student applies these principles insightfully across information sources and formats and uses logic and informed judgment to accept, reject, or replace information to meet a particular need.

**Indicators**

Indicator 1. Determines accuracy, relevance, and comprehensiveness

Indicator 2. Distinguishes among fact, point of view, and opinion

Indicator 3. Identifies inaccurate and misleading information

Indicator 4. Selects information appropriate to the problem or question at hand
Standard 3  The student who is information literate uses information accurately and creatively.

The student who is information literate manages information skillfully and effectively in a variety of contexts. That student organizes and integrates information from a range of sources and formats in order to apply it to decision making, problem solving, critical thinking, and creative expression. The student communicates information and ideas for a variety of purposes, both scholarly and creative, to a range of audiences, both in school and beyond; and in print, nonprint, and electronic formats. This Standard promotes the design and execution of authentic products that involve critical and creative thinking and that reflect real-world situations. The indicators under this Standard therefore deviate from the traditional definition of use. Rather than suggesting that students simply insert researched information into a perfunctory product, the indicators emphasize the thinking processes involved when students use information to draw conclusions and develop new understandings.

*Indicators*

Indicator 1. Organizes information for practical application

Indicator 2. Integrates new information into one's own knowledge

Indicator 3. Applies information in critical thinking and problem solving

Indicator 4. Produces and communicates information and ideas in appropriate formats

**INDEPENDENT LEARNING STANDARDS**

Standard 4  The student who is an independent learner is information literate and pursues information related to personal interests.

The student who is an independent learner applies the principles of information literacy to access, evaluate, and use information about issues and situations of personal interest. That student actively and independently seeks information to enrich understanding of career,
community, health, leisure, and other personal situations. The student constructs meaningful personal knowledge based on that information and communicates that knowledge accurately and creatively across the range of information formats.

**Indicators**

**Indicator 1.** Seeks information related to various dimensions of personal well-being, such as career interests, community involvement, health matters, and recreational pursuits

**Indicator 2.** Designs, develops, and evaluates information products and solutions related to personal interests

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**Standard 5** The student who is an independent learner is information literate and appreciates literature and other creative expressions of information.

The student who is an independent learner applies the principles of information literacy to access, evaluate, enjoy, value, and create artistic products. That student actively and independently seeks to master the principles, conventions, and criteria of literature in print, nonprint, and electronic formats. The student is able both to understand and enjoy creative works presented in all formats and to create products that capitalize on each format’s particular strengths.

**Indicators**

**Indicator 1.** Is a competent and self-motivated reader

**Indicator 2.** Derives meaning from information presented creatively in a variety of formats

**Indicator 3.** Develops creative products in a variety of formats

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**Standard 6** The student who is an independent learner is information literate and strives for excellence in information seeking and knowledge generation.

The student who is an independent learner applies the principles of information literacy to evaluate and use his or her own information
processes and products as well as those developed by others. That
student actively and independently reflects on and critiques per-
sonal thought processes and individually created information prod-
ucts. The student recognizes when these efforts are successful and
unsuccessful and develops strategies for revising and improving
them in light of changing information.

**Indicators**

**Indicator 1.** Assesses the quality of the process and products of
personal information seeking

**Indicator 2.** Devise strategies for revising, improving, and
updating self-generated knowledge

**SOCIAL RESPONSIBILITY STANDARDS**

**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.

The student who is socially responsible with regard to information
understands that access to information is basic to the functioning
of a democracy. That student seeks out information from a diver-
sity of viewpoints, scholarly traditions, and cultural perspectives in
an attempt to arrive at a reasoned and informed understanding of
issues. The student realizes that equitable access to information from
a range of sources and in all formats is a fundamental right in a
democracy.

**Indicators**

**Indicator 1.** Seeks information from diverse sources, contexts,
disciplines, and cultures

**Indicator 2.** Respects the principle of equitable access to
information
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.

The student who is socially responsible with regard to information applies principles and practices that reflect high ethical standards for accessing, evaluating, and using information. That student recognizes the importance of equitable access to information in a democratic society and respects the principles of intellectual freedom and the rights of producers of intellectual property. The student applies these principles across the range of information formats—print, nonprint, and electronic.

**Indicators**

- **Indicator 1.** Respects the principles of intellectual freedom
- **Indicator 2.** Respects intellectual property rights
- **Indicator 3.** Uses information technology responsibly

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.

The student who is socially responsible with regard to information works successfully—both locally and through the variety of technologies that link the learning community—to access, evaluate, and use information. That student seeks and shares information and ideas across a range of sources and perspectives and acknowledges the insights and contributions of a variety of cultures and disciplines. The student collaborates with diverse individuals to identify information problems, to seek their solutions, and to communicate these solutions accurately and creatively.
Indicators

Indicator 1. Shares knowledge and information with others

Indicator 2. Respects others’ ideas and backgrounds and acknowledges their contributions

Indicator 3. Collaborates with others, both in person and through technologies, to identify information problems and to seek their solutions

Indicator 4. Collaborates with others, both in person and through technologies, to design, develop, and evaluate information products and solutions
Appendix F

USF Consent to be a Research Subject

**Purpose and Background**

Mr. Tyrone H. Cannon, a graduate student in the School of Education at the University of San Francisco, is conducting a study on the knowledge of information literacy skills of graduate general and special education students. The study will also explore the graduate teacher education students’ readiness to integrate information literacy skills into their classroom teaching. The digital divide and the lack of information literacy skills especially impacts students in urban and poorer school systems that often to not have adequate access to technology or school librarian media/specialists to help the students develop information literacy skills. In many of these schools, the classroom teacher is responsible for teaching information literacy skills.

I am being asked to participate because I am graduate teacher education general education or special education student who is also an in-service teacher.

**Procedures**

If I agree to be a participant in this study, the following will happen:

1. I will complete two surveys that will ask questions about my knowledge of information literacy skills and my integration of these skills into my classroom teaching. I will also give basic information about myself, including age, gender, ethnicity, and whether I am a general or special education major. The surveys will take about 30 minutes to complete.

**Risks and/or Discomforts**

1. It is possible that some of the questions may make me feel uncomfortable, but I am free to decline to answer any questions I do not wish to answer or stop my participation at any time.
2. Participation in research may mean a loss of confidentiality. Study records will be kept as confidential as is possible. No individual identities will be used in any reports or publications resulting from the study. Study information will be coded and kept in locked files at all times or computer files with security passwords. Only study personnel will have access to the files.

3. Because the time required for my participation may be up to 30 minutes, I may become tired or bored.

**Minimization of Potential Risks**

The researcher will take every effort to minimize any potential risks to the subjects.

**Benefits**

There are two potential benefits by participating in this study. First, I will be helping future Teacher Education students by participating in a process designed to inform teacher education programs on how to improve the process of preparing in-service teachers to have strong knowledge of information literacy skills and to integrate those skills into classroom teaching. Second my name will be entered in a raffle to win one of two Ipod Nanos by participating in the completion of surveys.

**Costs/Financial Considerations**

There will be no financial costs to me as a result of taking part in this study.

**Reimbursement/Compensation to Subjects**

Participants will be eligible to enter a raffle to win one of two Ipod Nanos.

**Confidentiality of Records**

Study records will be kept as confidential as possible. No individual identities will be used in any reports or publications resulting from this study. Study information will be coded and kept in locked files at all times or computer files with security passwords. Only the researcher will have access to these files.
Questions: If I have any questions or comments about participation in this study, I should first talk to Tyrone H. Cannon (cannont@usfca.edu). If for some reason I do not wish to do this, I may contact the IRBPHS, which is concerned with protection of volunteers in research projects. I may reach the IRBPHS office by calling (415) 422-6091 and leaving a voicemail message, by e-mailing IRBPHS@usfca.edu, or by writing the IRBPHS, Department of Counseling Psychology, Education, University of San Francisco, 2130 Fulton Street, San Francisco, CA 94117-1080.

Consent: I have been given a copy of the “Research Subject’s Bill of Rights” and I have been given a copy of this consent from to keep. PARTICIPATION IN RESEARCH IS VOLUNTARY. I am free to decline to be in this study, or to withdraw from it at any point. My decision as to whether or not to participate in this study will have no influence on my present or future status as a student at USF.

My signature below indicates that I agree to participate in this study.

__________________________________________
Subject’s Signature

__________________________________________
Date

__________________________________________
Signature of Person Obtaining Consent

__________________________________________
Date
Appendix G

USF IRBPHS Application Approval

From: IRBPHS [irbphs@usfca.edu]
Sent: Friday, January 26, 2007 11:18 AM
To: Tyrone Cannon
Cc: evansss@usfca.edu
Subject: IRB Application # 07-005
January 26, 2007

Dear Dean Cannon:

The Institutional Review Board for the Protection of Human Subjects (IRBPHS) at the University of San Francisco (USF) has reviewed your request for human subjects approval regarding your study.

Your application has been approved by the committee (IRBPHS #07-001). Please note the following:

1. The informed consent for subjects beginning on page 3 of your application should be included as an appendix to be given to all participants. Please re-format this as “Appendix I” and fax it to this office to complete the approval process (a sample is at the IRB web site).

2. Approval expires twelve (12) months from the dated noted above. At that time, if you are still in collecting data from human subjects, you must file a renewal application.

3. Any modifications to the research protocol or changes in instrumentation (including wording of items) must be communicated to the IRBPHS. Re-submission of an application may be required at that time.

4. Any adverse reactions or complications on the part of participants must be reported (in writing) to the IRBPHS within ten (10) working days.

If you have any questions, please contact the IRBPHS at (415) 422-6091.

On behalf of the IRBPHS committee, I wish you much success in your research.

Sincerely,

Terry

Terence Patterson, EdD, ABPP
Chair, Institutional Review Board for the Protection of Human Subjects
IRBPHS – University of San Francisco
Counseling Psychology Department
Education Building - 017
2130 Fulton Street
San Francisco, CA 94117-1080
(415) 422-6091 (Message)
(415) 422-5528 (Fax)
irbphs@usfca.edu

http://www.usfca.edu/humansubjects/
Appendix H
Letter to Participants

February 28, 2007

Dear Teacher Education Student:

My name is Tyrone H. Cannon and I am a doctoral student in the School of Education at the University of San Francisco. I am conducting a study on the knowledge of information literacy skills of graduate general and special education students. My study will also assess the readiness of these students to integrate information literacy skills into their teaching. In today’s information driven economy, it is important that K-12 students have the proficiency to find, evaluate, integrate, and effectively use information; and access to appropriate technology is a key factor. Unfortunately, many of these students attend urban and poorer schools that may not have adequate technological support or on-site school librarian/media specialists. In these schools, the classroom teacher may have the responsibility to teach information literacy skills to their students.

You are being asked to participate because you are a graduate general or special education student who is presently teaching in a K-12 school. Your participation will help college and university librarians, teacher educators, and future teacher education students better understand how to meet the information literacy needs of students at all levels of education.

If you agree to participate, you will complete two surveys that will ask you questions about your knowledge of information literacy skills and the integration of these skills into your teaching. You will also provide basic information about yourself including age, gender, ethnicity, and whether you are a general or special education major. The surveys should take about 30 minutes to complete. Participants will also be entered in a raffle to win one of two iPod Nanos.

Thank you for your consideration. If you have any questions after today, I can be reached at (415) 422-2052. My email is cannont@usfca.edu.

Sincerely,

Tyrone H. Cannon, MSW, MLS
Doctoral Student
University of San Francisco