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A Workshop: Finding Information in the Information Age

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Abstract

"Finding Information in the Information Age" is a workshop designed for teachers, librarians, and administrations to bridge the gap between the recognized need for and the actual implementation of teaching information skills within the context of the curriculum. Topics covered during the 15 hours of instruction include designing a good research assignment, preparing students for research through presearch activities, using an online public access catalog and periodical database, searching and evaluating web sites, using and evaluating reference CD-ROMS, and searching Electric Library, Wilson databases, FirstSearch, and the State of Iowa Libraries Online (SILO). Workshop participants experience the first three stages of the information skills process themselves and apply the skills they learn to a unit they are teaching or are planning to teach in their classrooms.

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Finding Information in the Information Age

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CHAPTER 1

Introduction

No longer is it questioned that we are living in the Information Age, an age "characterized by rapid exponential growth of new information readily accessible in a diverse mixture of old and new print and electronic formats" (Breivik, 1992, p. 6). Every two to three years the amount of knowledge doubles (Wisconsin Association of School Librarians, 1992, p. iii). Herbert E. Meyer, former editor of Fortune Magazine and vice chair of the National Intelligence Council, points out that many executives "are discovering that the only thing as difficult and dangerous as managing a large enterprise with too little information is managing one with too much" (as cited in Breivik, 1992, p. 6). On the basis of Meyer's comments, Breivik (1992) goes on to say, "It is clear that many people in business do not know how to find and use this information effectively" (p. 6). In today's world, it is easy to find information on a topic. The difficulty is finding the best source of that information (Veccia, 1997, p. 6). As a result of this information explosion, government, business, and education are grappling with and recognizing the importance of what has come to be known as information literacy.

As early as 1986, information skills were identified as crucial in the modern workplace. A national report, A Nation Prepared: Teachers for the 21st Century, states:

> Such people will have the need and the ability to learn all the time, as the knowledge required to do their work twists and turns with new challenges and the progress of science and technology. They will not come to the workplace knowing all they have to know, but knowing how to figure out what they need to know,

> where to get it, and how to make meaning out of it. (Carnegie Forum on Education and the Economy, 1986, p. 20)

The American Library Association Presidential Committee on Information Literacy: Final Report (1989) makes a similar statement as it describes an information literate person:

> Ultimately, information literate people are those who have learned how to learn. They know how to learn because they know how knowledge is organized, how to find information, and how to use information in such a way that others can learn from them. They are people prepared for lifelong learning, because they can always find the information needed for any task or decision at hand. (p. 1)

By 1991, the Association for Supervision and Curriculum Development [ASCD] urged "schools, colleges, and universities to integrate information literacy programs into learning programs for all" because "[i]nformation literacy . . . equips individuals to take advantage of the opportunities inherent in the global information society" (ASCD Resolution 8, 1991). This same emphasis was included in several government documents, such as the National Education Goals listed in America 2000: An Education Strategy (1991). Goal 3 states, in part: "By the year 2000 . . . every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our modern economy" (p. 3). Goal 5 reads, "By the year 2000 . . . every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship" (p. 3). The Secretary [of Labor]'s Commission on Achieving Necessary Skills' [SCANS] (1991) report entitled What Work Requires of Schools says all workers need to be able to acquire, evaluate, interpret, and

communicate information and "to learn, to reason, to think creatively, to make decisions, and to solve problems" (p. xvii).

Having recognized the need for learning information skills, many of which are similar to the SCANS' skills (Copple et al., 1992; Secretary's Commission . . . , 1991), the questions then become, Where will these skills be taught? and, further, How will these skills best be taught and learned? This research project explores four elements that would help educators meet this need. It addresses three aspects of information literacy: information skills that are integrated into the curriculum, the information skills process, and the role of libraries and librarians in resource-based teaching and learning. It also addresses the importance of teaching educators how to implement these skills.

SCANS in the Schools (Copple et al., 1992) says it is possible to integrate information skills into each subject in the core curriculum (p. 1). The report goes on to state the importance of making connections between isolated pieces of knowledge and broader competencies or skills. Learning a Living: A Blueprint for High Performance (Secretary's Commission . . . , 1992) declares:

- Teaching should be offered "in context," that is, students should learn content while solving realistic problems. "Learning in order to know" should not be separated from "learning in order to do."
- Improving the match between what work requires and what students are taught requires changing how instruction is delivered and how students learn. (p. xvi)

Recent research on the brain and its implications for teaching also supports these statements. If teaching is "to be really effective, a learner must be able to create meaningful and personally relevant patterns. This type of teaching is most clearly

recognized by those advocating . . . integration of the curriculum, . . . and life-relevant approaches to learning" (Caine & Caine, 1991, pp. 81-82).

These recommendations imply "that schools will provide students with the opportunities to apply knowledge in real-life situations or simulations" (Copple et al., 1992, p. 9), not "first learn in the abstract what they will later be expected to apply" (p. 1). They further suggest that students will become more responsible for their own learning as they work together, just as they will be required to do in the workplace, grappling with problems and applying various combinations of skills (p. 9). Breivik (1991) adds:

> This education for the new knowledge environment must begin in elementary school and continue through college. The current heavy reliance on packaged information must give way to learning that prepares young people for lifelong learning in an ever-changing environment that is information rich. Throughout all levels of learning, the emphasis must be placed upon resource-based learning--learning that is based on the information resources of the real world and learning that is active and integrated, not passive and fragmented. (p. 5)

This type of learning requires restructuring, but not necessarily the restructuring of the curriculum. "What must be restructured is the learning process, the learning environment encompassing that process, and the relationship between the student and the teacher which is central to that process" (Haycock, 1991, p. 17). In resource-based teaching and learning, content is important, but so is the process of learning how to acquire and use that information (p. 16). Various information process models exist, such as the Big Six Skills approach (Eisenberg & Berkowitz, 1990), FLIP IT! (Yucht, 1997);

Kuhlthau's (1985) model, Follett Information Skills Model (Pappas & Tepe, 1994); REACTS (Stripling & Pitts, 1988, p. 9), the Six A's of Information Literacy (McCain, 1997), and S.P.I.R.R.E. (McElmeel, 1997, p. 92). The Big Six Skills approach applies to most information or decision-making problems; the others focus more specifically on the research process. Each model, however, includes the same basic information skills process: recognizing a need for information; constructing strategies for locating that information; locating and selecting appropriate resources and accessing the information within them; analyzing the information found and extracting the useful information; interpreting, organizing and presenting the information; and evaluating both the process and the product (Eisenberg & Berkowitz, 1990, p. 12; Office of the Superintendent of Public Instruction & Washington Library Media Association, 1996).

In resource-based teaching and learning, learning is student-centered. Students are required to critically analyze and synthesize information from a wide variety of sources available both inside and outside the traditional classroom (Farmer & Mech, 1992, p. 2). "The focus is on what the students are doing with those resources to facilitate their learning" (Haycock, 1991, p. 16). Students also become actively involved with other students in a variety of cooperative learning activities that are "geared to inquiry and that facilitate learning the 'how-to's' of informed problem solving and decision making" (Haycock, 1991, p. 16). Assignments are often problem-based and can be interdisciplinary in nature. No longer is the teacher the main dispenser of information. The teacher becomes a facilitator of learning, a guide and a co-learner who "is constantly interacting with the students--questioning, prompting, and assisting at points of need" (Haycock, 1991, p. 18). Learning can be authentically assessed by observing the students'

ability, knowledge, or competencies throughout the process; by examining various performance assessment tools, such as graphic organizers, journals or portfolios, the students have kept; and by having both the students and the teacher evaluate the process and the final product (Pappas, 1998, pp. 25-26; Wisconsin Educational Media Association, 1993).

Libraries and librarians play an important role in this type of learning. "In the library media center, learners have access to a wide variety of quality materials and information" (Thompson, 1991, p. 26).

> School library media centers collect a wide array of multiple media--books, magazines, CD-ROMS, online databases, videotapes, software--that complement the school curriculum. Sometimes a book (or a CD-ROM or a magazine or a videotape) is a far better resource than a Web site. Making these judgments and teaching students how to find and evaluate information are the essence of librarianship. What school media specialists teach is information literacy--the ability to find, analyze, and assimilate information. (Veccia, 1997, p. 6)

Having access to an information-rich environment, however, is not enough. As Breivik (1992) points out, "It is important not to confuse the development of information literacy with [content-based] library or bibliographic instruction" (p. 10). Although Breivik (1992) writes about colleges, the same can be said for many elementary and secondary schools. Too often library instruction is just an add-on (p. 10), time allocated so classroom teachers can have a planning period or time spent teaching students how to use an information source, such as an atlas or the Readers' Guide to Periodical Literature, in isolation, without any immediate, practical reason for learning to do so. "Only when

faculty require students to use a variety of information resources as [an integral] part of class assignments do students receive the message that the ability to locate, evaluate, and effectively use information is critical to learning" (Breivik, 1992, p. 10).

The assumption is that once teachers see how important information skills are for students, they will open up their curricula to include these skills. For most teachers, however, "there needs to be a tangible incentive, a 'return on the investment,' for deviating from 'their' curriculum" (Turner, 1991, p. 14). It does not seem to be enough that the possibility of long-term retention of skills only exists with their integration into classroom instruction (Haycock, 1985, p. 11).

Although the importance of information skills is beginning to be recognized, it is often assumed that teachers are the ones to teach these skills. Neither in the SCANS' reports (Copple et al., 1992; Secretary's Commission . . . , 1991, 1992) nor in many school reform initiatives (Thompson, 1991) is any mention made of the role of the school library or the library media specialist. The questions then become whether teachers themselves have learned these skills and how to teach them to others and whether they would be willing to consult or collaborate with librarians who are specially trained to teach these skills.

In the first release of a reform report produced by the Carnegie Foundation for the Advancement of Teaching, President E. L. Boyer (1986), writes:

> The quality of a college is measured by the resources for learning on the campus and the extent to which students become independent, self-directed learners. And yet we found that today, about one out of every four undergraduates spends no time in the library during a normal week, and 65 percent use the library four hours

> or less each week. The gap between the classroom and the library, reported on almost a half-century ago, still exists today. (p. 21)

Although some colleges and universities have elective library orientation classes, many education programs have not required their majors to demonstrate proficiency in information literacy skills (Farmer, 1995, p. 2).

Learning a Living: A Blueprint for High Performance (Secretary's Commission . . . , 1992) mentions the need of costly teacher training and staff development, especially if teachers and administrators are to be given the time they need during the school day and summers for training" (p. xvii). Time is needed in order to

- Develop new pedagogical skills required to teach in context, and to develop active, collaborative learning environments;
- Learn new instructional management skills and use new instructional technologies to develop new ways of interacting with students; and
- Gain experience with the principles of high performance as applied in restructured workplaces. (p. xvii)

The increased emphasis on information skills falls right in line with the mission of the library media program "to ensure that students and staff [emphasis added] are effective users of ideas and information" (American Association of School Librarians [AASL] & Association for Education Communications and Technology [AECT], 1988, p. 1). In the most recent edition of Information Power (AASL & AECT, 1998) the focus is no longer on guidelines for facilities, classes, and selection. The new emphasis is on standards for student learning, such as accessing, evaluating, and using information. S.

Mary Columba Offerman, library coordinator of the Presentation Sisters of the Blessed Virgin Mary in Dubuque, Iowa, says:

> Librarians trained in research skills and instructional technology are the ideal personnel for teaching these skills. . . . I've found that teachers and administrators . . . do not want this help! They feel this is a waste of time, and that students . . . know all about the library, library skills, resource and reference materials. (As cited in Micetich, 1984, p. 190)

Hambleton and Wilkinson (1994) found that even in schools where qualified librarians are available to provide support for resource-based teaching and learning, there is no agreement among principals, teachers and librarians on the role of the library media specialist in this type of program. Experience and qualifications of principals and teachers made little difference in their responses. In fact, in several cities across the United States, when budgets need to be cut or space needs to be created, library media specialists and libraries are often reduced or eliminated. (See e.g., Blume, 1992; Davis, 1991; Peterson, 1997; Skertic, 1995.)

For information skills to have their fullest impact, appropriate information skills must be integrated into the curriculum in places that naturally fit the teacher's goals, objectives, and instructional design and the students' needs and learning characteristics. In addition, the school library media specialist needs to become part of the planning process (AASL & AECT, 1988, p. 2; Turner, 1991, p. 13). By combining their areas of expertise and collaborating with each other, teachers and library media specialists can become effective partners for information literacy for the benefit of their students. Teachers have a strong content base. They know the curricula for their grade level and the strengths and

needs of their students (California School Library Association, 1997, p. 30). Library media specialists have been trained in information skills. They know resources and how to manipulate them. They also know their library collections (Farmer, 1995, pp. 1-2) and "have a broad knowledge base that includes an understanding of media, the application of media to the learning process, the needs of students for information sources, and instructional strategies" (AASL & AECT, 1988, p. 34). As Vandergrift (1994) concludes, "Surely such a person plays a significant role in both informal staff development and in more formal in-service education. In fact, school library media specialists have traditionally been key figures in that kind of staff development" (p. 101).

Problem

Many practicing teachers and current administrators have had limited, if any, training in information skills. Most were not required to demonstrate their proficiency in these types of skills during their education programs. After these teachers and administrators graduated from college, many new print and electronic resources have become readily available. Therefore, teachers and administrators need to be trained in information skills and in ways to integrate these skills into their curriculum. They also need to know how to use the new resources which have become available. One way to receive this training is through a staff development workshop. In Iowa, this type of workshop is often offered through a local area education agency.

Statement of Purpose

The purpose of this research project was to design, prepare, and teach a 15-hour workshop for teachers and administrators, entitled "Finding Information in the Information Age," in an attempt to bridge the gap between the recognized need for and

the actual implementation of teaching information skills within the context of the curriculum. While the underlying framework for this workshop was the entire information skills process, because of time limitations the emphasis was placed on the first three stages of that process: determining the information needs; developing information-seeking strategies; and locating and accessing information relative to needs.

There were two basic objectives of this workshop. First of all, participants would be able to conduct a comprehensive search on a topic using various resources such as an online public access catalog, ProQuest, the Internet, Electric Library, Wilson indexes, CD-ROM reference tools; SILO, ERIC, and FirstSearch. In order to do this, they would be able to evaluate a Web site and a CD-ROM; locate and access various types of information available in their school library and in other locations accessible to them; and select the best reference sources for a particular task. Secondly, they would be able to design or redesign a unit of their choice integrating the various resources which they found. In order to do this, they would be able to explain the components of and construct a good research assignment; follow the first three stages of the information problem-solving process; construct a pathfinder of resources for their unit; collaborate with their library media specialist to plan an integrated lesson; and use basic selection tools to recommend additional resources to supplement their unit.

Assumptions

For the past two years, teachers and administrators in the eight-county area served by the Green Valley Area Education Agency in Creston, Iowa, have been involved in summer research workshops supporting subject area committees in the development of accountability-based curriculum. Because curriculum work in this area is placed in the

context of national curriculum concerns, it was assumed that teachers and administrators not only were acquainted with the National Education Goals outlined in America 2000: An Education Strategy (1991) and the recent SCANS' reports (Copple et al., 1992; Secretary's Commission . . . , 1991, 1992), but they also were willing to implement such skills into their curriculum. It was further assumed that teachers had at least one unit of instruction that they desired to improve or a new unit that they would like to develop. It was also assumed that those who signed up for the course were aware of the importance of learning how to use resources effectively themselves and were willing to learn how to teach these information skills to their students within the context of a curricular unit.

Limitations

There were three limitations in this project. The first was the number and type of people willing to take this workshop. In order for such a workshop to be offered through Green Valley Area Education Agency, there must be at least six participants. Ideally, the workshop would be comprised of teachers, library media specialists, and administrators. This mixture was not guaranteed. Even though workshops are offered to both teachers and administrators, it has been observed that most administrators only participate in workshops in which teachers are not present. The second limitation was the availability of resources for workshop participants to examine. The purpose of the Green Valley Area Education Agency is to supplement the collections of school library media centers. Therefore, many reference sources, which typically should be found in school libraries, are not owned by Green Valley Area Education Agency. If schools within the area did, in fact, own these resources, it was difficult to borrow them for a few days because they are reference materials and they needed to be available to the students and teachers within the

schools. Since this type of workshop has not previously been offered, some of the resources that would support it have not been purchased. The third limitation was time. As a result, the emphasis of the workshop was on the first three stages of the information skills process: determining the information needs; developing information-seeking strategies; and locating and accessing information relative to needs.

Definition of Terms

In order to facilitate understanding, several key terms need to be defined.

Authentic assessment or achievement. This incorporates the idea that student activities and projects should be meaningful and resemble real-life situations. Three criteria are used to define authentic achievement: "(1) students construct meaning and produce knowledge, (2) students use disciplined inquiry to construct meaning, and (3) students aim their work toward production of discourse, products, and performances that have value or meaning beyond success in school" (Newmann & Wehlage, 1993, p. 8).

Collaboration. Staff members teach and train "colleagues in those things they themselves know and do best and the professional staff work together for the good of their students" (Senator, 1995, p. 12).

Constructivism. Constructivism is a theory "that learners construct their own knowledge and their version of reality from their own unique experiences" (Ellis & Fouts, 1996, p. 52).

Constructivist pedagogy. There are five basic principles of a constructivist pedagogy: "(1) posing problems of emerging relevance to learners; (2) structuring learning around 'big ideas' or primary concepts; (3) seeking and valuing students' points of view; (4) adapting curriculum to address students' suppositions; and (5) assessing

student learning in the context of teaching" (Brooks & Brooks, 1993, p. vii). A constructivist approach to education is "more concerned with understandings achieved through relevant experience and activity than with accumulated facts received from others" (Ellis & Fouts, 1996, p. 53).

Information literacy. Information literacy is "the ability to access, evaluate, and use information from a variety of sources" (Doyle, 1995, p. 30).

Information literate person. The California School Library Association (1997) expands Doyle's (1995) definition of information literacy. It describes an information literate person as one who accesses information by recognizing the need for information, recognizing that accurate and complete information is the basis for intelligent decision making, formulating questions based on information needs, identifying potential sources of information, developing successful search strategies, accessing a variety of print and technology-based sources of information, and being a competent reader. An information literate person evaluates information by establishing its authority, determining its accuracy and relevance, recognizing its point of view, discerning between fact and opinion, rejecting inaccurate and misleading information, and being able to create new information to replace inaccurate or missing information as needed. An information literate person uses information by organizing it for a practical application, integrating new information into an existing body of knowledge, and applying information in critical thinking and problem solving (pp. 8-9).

Information skills. Information skills are the abilities necessary to define one's information-problem solving task; to determine information-seeking strategies; to locate

and access information; and to use, synthesize, and evaluate information in light of the problem to be solved (Eisenberg & Berkowitz, 1990, pp. 5-9).

Information skills process. In the information skills process "students actively seek to construct meaning from the sources they encounter and to create products that shape and communicate that meaning effectively" (AASL & AECT, 1998, p. 2). Major elements in this process include "developing expertise in accessing, evaluating, and using information [which] is in fact the authentic learning that modern education seeks to promote" (AASL & AECT, 1998, p. 2).

Integrated library media skills. This involves "cooperative planning and teaching of library media skills as part of, or in conjunction with, the ongoing school curriculum" (Wisconsin Association of School Librarians, 1992, p. 102).

Resource-based learning. As the center of the learning environment, students use a wide variety of resources, which may include the teacher and the textbook, to broaden their learning base and facilitate their learning (Haycock, 1991, p. 16). "Resource-based learning is the process by which students acquire these information-handling skills: managing and using information to solve problems, interrelating knowledge, and effectively communicating learning outcomes" (Thompson, 1991, p. 25). In other disciplines, this same type of learning is similar to inquiry learning, discovery learning, or problem-based learning.

Resource-based teaching. Not everyone makes a distinction between resource-based teaching and resource-based learning. Often these terms are defined together as "instruction using a variety of media to explore a subject area which lends itself to the cooperative planning between the classroom teacher and the library media specialist [in

order to integrate] library media skills into the content areas" (Wisconsin Association of School Librarians, 1992, p. 105).

Restructured learning process. Students decide that they have need for information and determine what information is needed to solve a problem or address an issue. They then find and evaluate that information, organize it, and use it effectively to address the problem or issue at hand (American Library Association Presidential Committee on Information Literacy, 1989, p. 4).

SCANS' skills. These are the competencies needed for all workers as outlined in the reports of the Secretary's Commission on Achieving Necessary Skills (1991, 1992) and Copple et al. (1992). Some of these skills include acquiring, evaluating, interpreting, and communicating information and "the ability to learn, to reason, to think creatively, to make decisions, and to solve problems" (Secretary's Commission . . . , 1991, p. xvii).

School librarian or library media specialist. A library media specialist is "a person with appropriate certification and broad professional preparation, both in education and media, with competencies to carry out a library media program at the building level" (Wisconsin Association of School Librarians, 1992, p. 103). According to Information Power (AASL & AECT, 1988), the role of the library media specialist is that of an information specialist, a teacher, an instructional consultant, and an administrator/ manager of the library media program (pp. 26, 42).

Student-centered curriculum. The growth and development of the student is the central focus in a student-centered curriculum. Proponents believe true learning is "spontaneous, emotionally-invested, and cannot be pre-packaged, and that people learn

best when they can decide what to learn for themselves" (Ellis & Fouts, 1993, p. 41). Individual exploration, investigation, and choosing what to learn are essential components of meaningful learning (Ellis & Fouts, 1993, p. 42).

Summary

Several national organizations have recognized the importance of information literacy and, in at least some cases, of providing training for teachers in these information skills. One of the goals of the library media specialist is to teach these skills in integrated settings. Many times, however, teachers and library media specialists discuss the need of information literacy within their own respective circles. In recent educational journals, cooperative or collaborative teaching is frequently mentioned, but only in an interdisciplinary approach, such as math and science or English and social studies. If included at all in the goals and objectives, information skills are mentioned only in a general way. Teachers do not seem to understand how to implement the teaching of information skills into their curricula, nor do they seem to recognize that the library media specialist, already trained in information skills, would be a key person with whom to team in order to accomplish the mutual goal of information literacy. In this complex information world, it is time to end the "continental divide" (Veccia, 1997, p. 6) between teachers and library media specialists and capitalize on the "unprecedented opportunities for collaboration--for personal and professional growth and learning" (Veccia, 1997, p. 8). As teachers and library media specialists combine their skills, students will benefit.

Significance

After much money has been spent adding technology to the classrooms, the concern now is how to integrate that technology into the classroom. The problem is not limited to

technology, however; it encompasses a general lack of experience in integrating any tools into the classroom, including traditional library resources. In order to be prepared for the twenty-first century world of rapidly increasingly information, students need to know how to learn, to acquire and use information efficiently and effectively. Teachers and administrators need to possess these skills themselves if they are to guide their students. If this professional staff development workshop is successful, others can replicate it to train teachers and administrators in the process of finding information and integrating these information skills into their curricula. In this workshop, the participants assumed the roles of the students. They were guided through the first three stages of the information skills process as they learned to use resources new to them. They also experienced student-centered activities and techniques which they, in turn, could apply in their own classroom units of instruction.

CHAPTER 2

Methodology

Samuel Johnson said in 1775, "Knowledge is of two kinds. We know a subject ourselves, or we know where we can find information upon it" (Hill, 1934, p. 365). This statement encompasses the purpose of both schools and libraries. But, as Montgomery (1992) asks, "What happens when these two institutions try to integrate their purposes?" (p. 529). In effect, this is the mission of the modern school library media program: "to ensure that students and staff are effective users of ideas and information" (AASL & AECT, 1988, p. 1).

Literature Review

The literature review analyzes research about the impact of integrated information skills instruction on student learning, the importance of teaching an information skills process, and the role of libraries and librarians in resource-based teaching and learning. It also analyzes research on the need for training teachers in the information skills process and research on effective methods of professional staff development.

Eisenberg and Brown (1992) conducted a literature review to determine the research status of four major themes about library and information skills instruction. One of those themes was that information skills need to be fully integrated with the school's curriculum, not taught in isolation if that instruction is effective. On the basis of his study, he concludes that "there is little documented research to support this view or to support the various approaches offered to effect integrated instruction in elementary and secondary schools" (p. 105). After conducting a more recent literature review, Haycock (1995) concludes that there is some evidence that effective information skills instruction

depends upon curriculum-integrated instruction which teachers and librarians cooperatively plan and team teach. The purpose of his review was to recognize the research that has been done in the area of library science and to build upon it in order to provide a framework for effective school library practice.

Kester (1994) sought to determine if incoming freshmen had been taught information-seeeking skills in high school, who had taught them these skills, and if those skills had transferred from high school to college. She administered a questionnaire with open-ended questions to the 442 students enrolled in LIBS 1000 Research Skills, a required one-hour course to introduce students to the academic library and its resources, at a mid-sized university in a rural area of eastern North Carolina. Only the 300 responses from freshmen who had graduated from high school the previous spring were used in the study. Eighty-five percent had received some instruction in high school. Of these, 57% identified librarians as their only instructors while 16% reported that both teachers and librarians taught them research skills (p. 11). The questionnaire also listed standard reference terms and resources and asked the students to identify as many as they could. The only significant differences to be found between those with and without library instruction were on four of the twelve items: identification of author, publisher, copyright date, and reference section (p. 15). This study is limited in that the data do not reflect the entire information skills curriculum taught during pre-college classes nor library search strategies. On the basis of the study, Kester reports

> High school library skills instruction appears to have little carry over or effect on students going to college. . . . Also, little integration of library skills with course

content appears to be taking place, and team teaching between the librarian and the classroom teacher is not yet prevalent. (p. 17)

Sometimes students have not been taught adequate information skills. In a nine-week ethnographic study, Pitts (1995) observed a class of junior and senior science students who had been given very little guidance by the teacher in their assignment "to work in groups to produce a video documentary on some topic related to marine biology" (p. 178). The purpose of her study was to investigate why students make the decisions they do when they are seeking and using information. She found that the students, not really knowing how to access the available material or how to present it, fell back on what little prior knowledge they had to present a passable project with very little learning of either content or process. She states, "It is important to note, however, that the information-seeking-and-use knowledge was never accessed in isolation. . . . Students always used [it] in conjunction with subject matter" (p. 182). This study demonstrates that educators do sometimes assume students have learned skills that, in fact, they have not learned, as well as the fact that educators themselves may not know how to use or teach the skills.

In ongoing research in Sydney, Australia, Todd (1995) is investigating the impact of information literacy programs on student learning. This specific experimental study tested the assumption that information skills instruction, integrated into the science curriculum for students in the first year of high school, contributes to student achievement in a specific subject area as well as to overall student attitudes and motivation (p. 134). The two classes in the treatment group received science instruction using teaching-learning strategies that included instruction in the steps and skills of the information-

seeking process. The two classes in the control group received only the state-prescribed science content. Todd concludes that both a process approach and an integrated approach to information skills instruction are valuable and appear "to have had a significant positive impact on students' mastery of prescribed science content and on their ability to use a range of information skills to solve particular information problems" (p. 137).

Kuhlthau (1993) investigated the problems and successes encountered when library media specialists and teachers implement the constructive process of learning from a variety of sources of information. After two years of conducting training institutes across the United States, Canada, and Sweden and collecting responses, she noted that the primary implementation problems seemed to be lack of student time on task, planning time, confusion of roles, and poorly designed assignments. Problems encountered in successfully implemented programs mainly focused on learning problems of students, whereas problems encountered in struggling programs focused on getting the program established (p. 14). Since reasons for success were hard to identify, Kuhlthau then set up a longitudinal case study of a successful program in Manhasset (New York) Junior High School from 1990 to 1993. During this time, site visits, focus interviews, and assessment questionnaires were used to obtain evidence of participants' perceptions of what occurred. As a result, ten elements of success summarized into four basic enablers were identified. Programs which were successful incorporated a team approach of administrators, teachers, and library media specialists; a mutually held constructivist view of learning compatible with the process approach; a shared commitment to teaching skills and motivating students; and competence in designing activities and strategies (p. 16).

What is the role of libraries and librarians in resource-based teaching and learning and the effect of teaching information skills on academic achievement? The literature review conducted by Eisenberg (1992) concludes that "there are a surprisingly limited number of studies that directly focus on questions of impact and worth of library and information skills instruction" (p. 103). In order to update and broaden the somewhat limited research on this topic, Lance (1994) conducted correlation, factor, and regression analyses on data compiled on 221 out of 1,331 Colorado public schools during the 1988-1989 school year. Schools included in the sample had to have library media centers that had responded to the 1989 survey of school library media centers in Colorado and had to use the Iowa Tests of Basic Skills (ITBS) or Tests of Achievement and Proficiency (TAP) as measures of student achievement (Lance, 1994, p. 167). Therefore, a random sample was not possible. The self-selected sample, however, did fit the profile of all public schools in Colorado and in the United States when different school levels, enrollment ranges and district settings were compared (p. 168). Although the study is limited because other characteristics might distinguish the sample from the population of the public schools it was intended to represent, the findings did provide evidence that students whose library media specialists performed an instructional role tended to achieve higher average scores (p. 172). Lance (1994), however, recognized that further research needs to be done as other predictors of academic achievement, such as teaching styles, and library media center variables--such as access to library media centers, the way information skills are taught, and the role of technology--may also be relevant (p. 172).

An ethnographic study by Meyer (1990) focused on the subjective meaning teachers held about resourced-based teaching and the factors which affected its

implementation in their classrooms. Teachers from four Canadian schools of similar size within the same school system were involved in this study. In all four schools, Meyer found that teachers held beliefs ranging from commitment to fear regarding students' ability to learn if resource-based teaching strategies were implemented. Major variations were also found in the school level factors which influenced teachers to use resource-based teaching strategies. These included administrative support, the relationship between the teachers and the school librarian, and benefits to the students. The school with the highest degree of implementation had the most administrative expectations; schools with a low levels of implementation had little or no administrative expectations. An important finding of this study is that many teachers are not willing to risk abandoning their traditional classroom authority to form a working partnership with the librarian without strong and continuous leadership at all levels, including professional development and high administrative expectations.

The importance of training principals in the value of collaboration between teachers and librarians and having their support in this type of planning is also indicated in two other studies. Part two of a survey conducted by Tallman and van Deusen (1994) examined three external conditions affecting the consultation activity and information skills instruction of library media specialists: requirements to provide teacher planning time; the full-time or part-time status of the library media position; and the employment requirement for state certification as a professional library media specialist. Each of these conditions is a result of administrative decision making. Tallman (1995) reanalyzed the database of the above study. One finding indicated that administrative support influenced the activity level of the library media specialist in curriculum planning with teachers.

Hambleton and Wilkinson (1994) conducted research on resource-based learning programs in Canada in order to ascertain the relationship between the presence or absence of an effective library program in the school, the ability of that school to implement a resource-based teaching/learning program, and the role of the teacher-librarian in program planning and implementation. A total of 189 principals, 189 librarians, and 871 teachers in Ontario and Saskatchewan were surveyed. Follow-up interviews were conducted with 22 schools. The interviews and comments reinforced the statistical data. Hambleton and Wilkinson drew the following conclusions:

> Effective resource-based leaming programs depend, with few exceptions, on the presence of at least a half-time teacher-librarian and upon an active and creative school library program integrated with the classroom program. A strong educational philosophy involving school library development must be supported by an equally strong commitment at all administrative levels and it was evident that, without this support, curricular mandates could not be met (p. 28).

There was, however, no agreement among the principal, teachers, and library media specialist on the role of the latter in resource-based programs (p. 28). Since years of experience and qualifications of principals and teachers made little difference in their responses, training is needed to change attitudes about the benefits and effectiveness of school librarians (p. 29).

O'Hanlon (1987) conducted a survey of elementary-education faculty at teacher-training institutions in Ohio "to investigate the role of library skills training in teacher preparatory programs" (p. 7). At the time of the survey, over half of the respondents indicated that library skills instruction was up to the individual instructors at their

institutions. Respondents agreed that library skills instruction, taught by librarians, should be part of the teacher-training program and that "such instruction would enhance the future teacher's ability to foster elementary-school pupils' research skill development" (p. 20). They also believed that the ideal first priority of teacher-training programs should be to teach students lifelong or independent-learning skills (pp. 20-21).

Another section of this survey addressed the issue of the research skills of education students. One question asked about the types of research projects frequently assigned by faculty. Only those who assigned projects requiring library use were asked to respond. Nearly one third of respondents did not answer this question, indicating that a large number of elementary-education faculty surveyed either do not require independent research projects or do so infrequently. Book or journal article reviews, short term papers, and literature reviews were commonly mentioned among those faculty who required independent research projects (pp. 22-23). A little over half of the respondents did not assume their lower-division students knew how to use library resources effectively but three fourths assumed that their upper-division students knew how to do so. After evaluating research assignments their students completed, however, only 35.5% (lower division students) and 44.2% (upper-division students) of these respondents said their students had adequate library skills (p. 23). Respondents believed that elementary students are currently taught how to use the card catalog, encyclopedias, indexes, and how to find books in the library but are not taught how to analyze their information needs, frame questions to be answered, or search different kinds of sources to answer those questions. They thought all of these skills were important (p. 24). Less than one third of

the respondents agreed that graduates from an Ohio teacher-training program are adequately prepared to teach their students library research skills (pp. 24-25).

Cordeiro, Kraus & Binkowski (1997) examined the role of problem-based learning as an approach to the delivery of staff development (p. 3). Qualitative analysis of open-ended survey questions and observation records indicated that all participants believed that problem-based learning was an effective approach for staff development (p. 23). They preferred the real problem-based learning project over the simulated one because it had immediate relevance to the workplace. They also reported that problem-based learning "provides opportunities similar to on-the-job learning, allowed people to practice and reflect on their learnings, afforded participants opportunities to learn from others, and included peer and self-evaluation" (p. 24).

Summary

The review of the literature shows support for teaching information skills in the context of curriculum. It also shows the need for teachers to know the information skills process in order to develop good assignments and to see the benefits not only of school library media centers but also of planning with the library media specialist for resource-based instruction. This requires training because many teachers did not have to use information skills nor did they learn how to teach the information skills process in their undergraduate preparation. Problem-based learning is an effective approach for professional staff development. Research also shows that underlying this whole issue is the importance of gaining the support of administrators, for they are the ones in the position of making key decisions which not only affect the role of the library media

specialist in a school but also the opportunity for teachers and librarians to have the time to plan collaboratively.

Procedure

Many practicing teachers and current administrators have had limited, if any, training in information skills. Most were not required to demonstrate their proficiency in these types of skills during their education programs. After these teachers and administrators graduated from college, many new print and electronic resources have become readily available. Therefore, teachers and administrators need to be trained in the information skills process and in ways to integrate these skills into their curriculum. They also need to know how to use the new resources which have become available. One way to receive this training is through a staff development workshop.

Designing, Preparing and Teaching the Workshop

"Finding Information in the Information Age" was designed in an attempt to bridge the gap between the recognized need for and the actual implementation of teaching information skills within the context of the curriculum. It was felt that teachers would start to integrate information skills into their curriculum once they were aware of the skills involved in finding information to complete their assignments. The goals of the workshop were for participants to realize that information skills can be integrated into every curricular area, to understand and experience the first three stages of the information skills process, and to begin to implement resource-based teaching and learning in their classrooms. Additional goals were that participants would see a need for retraining and the value of collaboration between the teacher and the library media specialist in planning an effective resource-based unit of instruction.

Workshop approval and announcement. In order to teach a workshop through the Green Valley Area Education Agency [AEA], several steps must be followed. First of all, the potential instructor must have a master's degree or teach under the supervision of someone who does. Since the latter was necessary in this case, the instructor met with her supervisor to determine the feasibility of the proposed workshop, its objectives, and its content. A description of the proposed workshop was written and submitted to the Staff Development Committee for approval. After the workshop was approved, the dates, time, and location were established and the workshop was advertised on the Green Valley AEA Web site. Because this was the first semester in which workshops and courses were advertised primarily by means of the Internet and because several area schools were just beginning to have Internet access, a flyer, including a registration form, was also developed and sent via AEA van mail to each teacher and administrator in Green Valley AEA area schools.

Workshop development. The details of the workshop were then outlined, including determining the specific activities, resources, and assignments for each session. The Southwestern Community College Library and the Creston Public Library were visited and the CD-ROM and video catalogs of Green Valley AEA were consulted to see what reference materials were available for instructional purposes. H. W. Wilson, Infonautics, and Gale Research were contacted to see if sample materials could be obtained for this class. H. W. Wilson provided ten sampler discs of their databases and Infonautics provided five trial subscriptions of Electric Library for this class. The State Library of Iowa was contacted for permission to train class participants on FirstSearch

and the authorization code and password were obtained. The addresses of a few basic educational Web sites were also located and verified.

Preparation of materials. After the details of the workshop were finalized, handouts, visual aids, the initial questionnaire, and the evaluation sheet were prepared. If copyright statements did not specifically give duplication rights for this type of instruction, authors of articles and Web materials were contacted for permission to copy and distribute their materials for the workshop participants. The CD-ROMs selected for instruction and examination were reserved. Before the sessions in which they were used, these CD-ROMs, the Wilson sampler discs, and the Electric Library trials were loaded on to the computers in the classroom and tested. A handout was developed indicating which computers had which software. The ERIC, SILO, and FirstSearch online sites were bookmarked on each computer.

Delivering the Workshop

Eight people registered for the workshop: five teachers, two librarians, and a library paraprofessional. Four of the teachers were from the same school. The workshop was taught in five, three-hour sessions from 6:30-9:30 p.m. on September 24, October 1, 8, 22, and 29. Session one and the first hour of session two were held in a Green Valley AEA classroom. The rest of session two was held in the Southwestern Community College Library across the street. Sessions three through five were held in the computer lab of Green Valley AEA.

The workshop was designed to be taught on two levels: 1) the participants were colleagues, seeking instruction to take back to their classrooms and 2) the same participants were students, actually going through the first three stages of the information

skills process and completing activities as their own students would do in their classrooms. Session one included an introduction to the workshop and to each other as well as a review of the syllabus and the assignments. Participants also completed a brief questionnaire to determine what skills they already possessed and what their expectations were from the workshop. (See Appendix A for the tallied responses.) Activities and discussion included brainstorming the many resources available, discovering the steps one goes through to solve a common problem, and introducing the components of a good resource-based research assignment. Each of the following sessions began with the opportunity for participants to share reactions to what they had learned during the previous session or from their homework assignments. Session two introduced participants to such skills as defining the task, webbing, broadening and narrowing a topic. Participants paired up and completed an activity using the online card catalog and a periodical database (ProQuest) for their topics. They also examined print encyclopedias, used the Encyclopedia of Associations, and compared other print resources of their choice. Session three focused on strategies for searching, not surfing, the Internet. Handouts were given on evaluating Web sites. Participants then had time to apply these search strategies to their topics and evaluate at least one Web site they found. Session four focused on various CD-ROM reference databases, such as the Wilson databases and Electric Library, and CD-ROM encyclopedias, such as Grolier's Encyclopedia, Encarta, and Compton's Interactive Encyclopedia. Handouts were given on evaluating CD-ROMs and computer software as well as resources available through Green Valley AEA containing reviews of computer software and Internet sites. Session five introduced online resources, such as ERIC [Educational Resources Information Center], FirstSearch,

and SILO [State of Iowa Libraries Online]. Class members were then given some research questions and asked to find information on as many as possible in the twenty minutes allowed by using the FirstSearch databases. This activity required them to practice the various skills they had learned throughout the workshop. The remaining time was spent sharing what they had learned and how they had applied or how they intended to apply it in their classrooms. In this way they had the opportunity to share with each other part of what they had been including in their journals at the end of each class session. (See Appendix B for the journal entries of each student.)

Evaluating the Workshop

At the conclusion of the workshop, each participant discussed what they had learned, what they liked, what they thought could be improved, and how they had implemented or planned to implement what they had learned into their courses. They also completed a workshop evaluation. (See Appendix C for the tallied responses.) After reading the journal entries and evaluation sheets, as well as personally reflecting on each class and discussing the sessions with my supervisor, recommendations for revision were noted and the syllabus was modified. (See Appendix D.)

Contents of the Project

The project contains the workshop syllabus, the flyer advertising the workshop, the initial questionnaire, a copy of the handouts, a copy of each permission statement, a copy of the visuals used during the workshop sessions, a description of the in-class and out-of-class assignments, a bibliography of resources introduced, and the evaluation sheet.

CHAPTER 3

The Project

Included under separate cover are the original syllabus for the workshop "Finding Information in the Information Age," a flyer advertising the workshop, the initial questionnaire, a detailed outline and a narrative of each class, a copy of the handouts given to workshop participants, a copy of the permission statements, a copy of the visuals used during the workshop sessions, a description of the in-class and out-of-class assignments, a bibliography of resources introduced, and the evaluation sheet.

CHAPTER 4

Summary, Conclusions and Recommendations

Summary

This research project was designed for in-service teachers, librarians, and administrators in an attempt to bridge the gap between the recognized need for and the actual implementation of teaching information skills within the context of the curriculum. Specific goals of the workshop were for participants to realize that information skills can be integrated into every curricular area, to understand and experience the first three stages of the information skills process, and to begin to implement resource-based teaching and learning in their classrooms. Additional goals were that participants would see the need for retraining and the value of collaboration between the teacher and the library media specialist when planning a resource-based unit of instruction.

A 15-hour workshop, "Finding Information in the Information Age," was designed, prepared, and taught to five teachers, two librarians, and a library paraprofessional representing five schools in southwest Iowa. The workshop was conducted over a six-week period during the fall semester of 1997, one three-hour session per week with no session during the fourth week. Workshop participants actively engaged in various types of in-class and out-of-class resource-based activities, which they could later incorporate into their own teaching methods and lessons, as they experienced the first three stages of the information skills process. During the sessions they had hands-on instruction and practice in using an online public access catalog (OPAC); periodical databases such as ProQuest, FirstSearch, and those from H. W. Wilson; reference CD-

ROMS and SILO and ERIC. They also received instruction and practice in developing an effective search strategy, searching the Internet, and evaluating Web sites and CD-ROMs.

During the development stage of this project, it became obvious that there was more to teach than what could be effectively taught during a 15-hour hands-on workshop. Even though many activities were eliminated, other changes had to be made during the actual teaching of the workshop because various activities took a longer or a shorter amount of time than anticipated. It was also discovered that teachers experience many of the same frustrations as students in going through the information skills process. Some did not like working in pairs; others were frustrated at having to leave a task before they had completely mastered it; still others thought they could save time by not completing a search strategy; one was frustrated by the number of "hits" he found on the online catalog. The participants were surpised at how long it took them to find resources for one of their own typical assignments. In many cases, the information needed was not where they had expected to find it. Others had not realized what type of resources were actually available in their school libraries. Throughout the course of teaching this workshop, it became easier and more comfortable for this instructor to assume the role of facilitator rather than lecturer. It was also encouraging to discover that the workshop met a real need of the participants, to watch their attitudes toward the workshop and its activities change, to hear how they were implementing what they were learning into their classrooms, and learn that they were sharing what they were learning with their colleagues and administrators and recommending this workshop to others.

Conclusions

As the project developed, it became obvious that Green Valley Area Education Agency had access to more resources than course participants would have time to examine and that more skills are involved in finding information than could be taught in a 15-hour workshop. Therefore, some decisions had to be made. It was assumed that teachers would feel that they knew about basic print resources and would want to spend more time on computer resources. This assumption was verified in the initial questionnaire. All felt comfortable finding information through a print card catalog but none had used an online public access catalog (OPAC). Although they had used the print version of the Readers' Guide to Periodical Literature, they had not used the CD-ROM version. They had signed up for the workshop because they wanted hands-on experience with the Internet, CD-ROMS, SILO, and/or ERIC. (See Appendix A.)

In spite of this, it was felt that teachers did need to find out what materials students actually had available to them in their libraries. Therefore, participants were asked to write out a typical research assignment they have given. These were compiled and handed out at the end of the first session with the instructions to choose one assignment and find information to complete it from their school library. They were asked to spend no more than thirty minutes on this part. Afterwards they were to open the sealed envelope and answer questions about the process. The teachers were surprised at how long it took to find information on the topic. In some cases, they learned how old or scarce some of the reference materials were in their libraries. Sometimes they were surprised that information was not found in places they expected. From this activity and the brief discussion on what makes a good assignment, most commented that they needed

to improve their assigmuents and to check to make sure adequate materials were available to students. In the future, more time needs to be devoted to the aspect of developing good assignments, however, as the participants had difficulty suggesting how assignments could be improved. This could almost be a three-hour session in itself.

It was also felt that participants needed to have at least some exposure to various print resources so they would be reminded that these were options for research. It was decided that they might not be aware that the amount and level of coverage of a topic varies in different encyclopedias and of the existence of the Encyclopedia of Associations and its value for research. In the discussion period and in their journal entries, several participants remarked that they found these activities enlightening. Since some of the skills needed to find information on the Internet and the various CD-ROMs are similar to the skills needed to find information in an OPAC and a periodical database such as ProQuest, it was further decided to introduce these skills by exposing students to ProQuest at the Southwestern Community College Library in Creston, Iowa, and to the online catalog at either Southwestern Community College in person or the University of Northern Iowa via Internet. Some participants were frustrated with these experiences either because there were so many hits on their topic (UNI) or because they could not find anything on their topic under the words they had entered (Southwestern). After discussion, they could then see the importance of the broadening and narrowing activities. Some suggested going to Southwestern Community College at the end of the course because they felt as though they could use these resources more effectively then.
In the future, it would probably be better to eliminate ProQuest and continue to use only the Wilson databases and FirstSearch to locate periodicals. Another suggestion would be

to use only an online catalog that can be accessed through the Internet, such as the University of Northern Iowa's UNISTAR OPAC or the University of Iowa's OASIS OPAC rather than the online catalog at Southwestern. This could be done through the Internet on the computers in the AEA computer lab. By not having to travel to Southwestern, some time could be saved. Eventually, Green Valley AEA 14 will have an online catalog with access via the Internet, so this could also be used for the activity and more emphasis could be made on using the resources of the AEA. By making these changes, the two hours spent at Southwestern Community College could be devoted to looking at print reference sources with which class participants are not familiar and which are not available at the AEA.

Searching the Internet has been taught several times before as a stand-alone workshop; therefore, that section ran smoothly. More hands-on time was needed, however. Another suggestion would be to spend more time demonstrating the differences in Web sites in order to enhance the section on evaluating Web sites. In addition, it would be more effective to design an activity on Web evaluation (other than a written evaluation) which the class members could, in turn, use with their students. The participants also wanted more hands-on time with the CD-ROMs the following week. Experience showed that demonstrating a resource first, followed by guided practice and then practice searching individually or in pairs worked best, so this procedure was followed with ERIC, both the CD-ROM and online versions, SILO, and FirstSearch. This method required less time, partly due to the fact that the participants had already learned the basic searching strategies by this session so only the minor differences between these resources needed to be taught. The fact that the Web sites were bookmarked also helped.

Several class members commented on the importance of keyboarding skills and their lack of them. The culminating exercise required the participants to summarize what they had learned and apply it using FirstSearch. It was an effective demonstration of their progress in performing the first three stages of the information skills process. The fact that more hands-on time was needed throughout this course did serve to illustrate to the teacher participants the importance of their allowing their students sufficient time to do research.

As the course unfolded, it became obvious that the syllabus needed to be was modified and it was. The first session's activities went more quickly than anticipated and some of the second session's activities were introduced. Activities during classes two, three and four took much longer to complete than anticipated; therefore, only one CD-ROM evaluation was required and the collection development activity was dropped. The latter activity would be valid for a longer workshop, however. In fact, four of the participants went to their principal after they had completed their first night's "classmate assignment" activity and remarked that their library really did need some more current resources. The principal essentially asked them to do the components of the collection development activity and then give him their recommendations as there was some "extra" money available. The assignment for the participants to plan with their library media specialist was incorporated into the class activities and discussion because the composition of the class allowed this to be done. It would have been difficult otherwise because the school in which four of the class members were teachers had only a part-time librarian who spent the majority of his day as the music teacher. The final week of the workshop also coincided with the end of the first quarter and the deadline for grades. As

evident in their journals and discussion throughout the course, however, the participants immediately began applying or planning to apply what they were learning in their own teaching. Therefore, the formal "unit" requirement was modified. Instead, participants were asked to discuss what they had learned from the workshop. Then they were asked to journal either how they had applied this knowledge in their classrooms and the results they saw or how they were planning to incorporate what they learned in specific lessons they were going to teach. With a longer workshop, the unit assignment could also stand. The pathfinder assignment also needs to be explained more clearly when it is first introduced and an example at either a junior high or high school level needs to be given.

It is important to teach this workshop during the school year so that teachers can actually take what they are learning back into their classrooms and apply it during the week. It is also crucial to set the workshop in the context of a unit. Everything was more focused than it would have been if it were only a series of unrelated activities in isolation. This focus tended to lead to immediate application as it forced the students to take their learning a step further and relate it to something they were doing. Learning was not just abstract and theoretical but practical. The partipants actually went through the first three stages of the information skills process, experiencing the possible frustration points and seeing the benefits of the process for their students. When the workshop is offered again, it will be a 30-hour workshop instead of a 15-hour workshop. More time was needed throughout the workshop, especially for computer work and the homework assignments. It would also work better if it were spread out over a slightly longer period of time, with careful attention to scheduling so that the final week of the workshop does not interfere with the end of a quarter and the deadline for grades.

The fact that there were four participants from the same school served as a catalyst for change as these teachers went to their principal and coworkers to share what they were learning and were able to initiate some changes. This leads to a suggestion that this workshop be taught as in-service sessions at a school for teachers and librarian throughout one semester or even a whole year. That way they could work in their own library. The various teaching components could be taught in a three-hour session every three weeks with teachers working in small groups or individually in the computer labs or in group planning meetings at least one hour a week during the intervening weeks. One school district with two schools may be recommending this as their Phase III program a year from now. The participants in this workshop remarked that if they had known the workshop was going to be so much work, they would not have taken it. Yet, after they had completed the workshop, they said it was the most valuable one they have had. A few even stated that they wished they had had a course like this in college. It would be useful to require that a course similar to this workshop be taken by pre-service teachers right before student teaching. It would, however, need to be during a semester in which they have some contact with students so that they will be able to apply what they are learning in a classroom situation. The ideal would be a student teaching situation in which four days a week are spent at the schools and a fifth day spent on campus taking some methods classes, of which this would be one. A third suggestion would be to implement elements of this course as essential, integrated parts of various core teacher preparation courses. A follow-up course or an additional credit hour could be added to include instruction and activities in the last three steps of the information skills process: use of information, synthesis, and evaluation.

Recommendations

It is suggested that further research be done in several areas related to this project. The research of Kester (1994) could be replicated in other colleges to see if other colleges experience similar results in the transfer of information skills instruction between high school and college. Secondly, research could be developed to determine if Boyer's (1986) observations of a gap between the classroom and the library among undergraduates are still true. O'Hanlon's (1987) research could be replicated in teacher training institutions in other states to see if similar results are obtained or if any changes are noted in the past eleven years. As recent graduates of the library media studies program begin to implement the integrated process approach to information skills instruction, studies could be developed to determine if teachers' and principals' views of resource-based instruction and librarians have changed. The workshop developed for this project could be taught with other groups to see if similar results are obtained. Finally, a similar workshop needs to be designed, prepared, and taught which emphasizes the final three stages of the information skills process: use of information, synthesis, and evaluation.

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Appendix A

Pre-Workshop Information Sheet Tally

At the beginning of the workshop, each of the eight students completed an information sheet. In addition to their name, phone number, school, grade(s) taught, and subject(s) taught, students also answered the following two questions. Their responses are listed below each question.

Why did you decide to enroll in this workshop?

We are getting Internet at the [name of school] library and I now know something about it but I want to be more skillful. I'm working toward renewing my teaching certificate as well.

Professional growth.

With the wealth of information available, information management is as critical as the data collected.

I thought it would help me become a better teacher and become more aware of the technology that could be used in my classes.

To learn more about researching using the computer.

To better understand where and how to look/find information using the computer and then to pass it on to the students so they have a better understanding how to go about searching.

It would force me to practice using resources that I don't take the time to use.

To learn more about how to find information on the Internet, CD-ROMS, etc.

What do you hope to accomplish from this workshop?

Be proficient about SILO and Internet

To be more effective in guiding students

Learn about SILO, shortcuts on Internet and Infotrac

Become more aware of the technology that could be used in my classes

Better use of computer and research tools

To better understand where and how to look/find information using the computer and then to pass it on to the students so they have a better understanding how to go about searching

Time to utilize various resources

To be better able to use and teach using research

On a scale of 1 (low) to 5 (high), please rate your ability/comfort level on the following:

Students also rated their perceived ability using basic information finding tools and concepts to be covered in the workshop. The ratings have been added together. If all eight students had rated an item "5," the total would have been 40.

34 Using a card catalog (print)	12 Using an online catalog (OPAC)
33 Author card	13 Using an online index/database
33 Subject card	23 Using the Internet
33 Title card	20 Using a reference CD-ROM
33 Using the Reader's Guide to Periodical Literature	12 Using ERIC
34 Planning with another teacher	26 Team teaching
20 Resource-based teaching	17 Resource-based learning
23 Integrating lessons	28 Locating information in your library

Appendix B

Journal Entries

Student A

September 24, 1997.

I have some knowledge of Internet and have had some practice at the public library. Many times I have been frustrated in finding what I want within a reasonable time. I thought this was because I just needed more practice--which is partly true--but I also came to realize tonight that the Internet contains so much information that we have to be aware of when to use it and when not to use it. Information gleaned from it can be overwhelming or sometimes we can search in vain for the right information.

When we do get on Internet at [name of school], I will strive to teach students that they have a variety of resources to choose from when answering a question or researching a project. Internet is just one of those sources. Students must learn that some information is found much easier in books, magazines, community resources, etc. Current, fast-changing information can be found on the net. History, for example, is best left to printed material. Students should know the advantages and disadvantages of Internet and they should become aware of other available resources around them.

Our class exercise of taking a topic and listing sub-topics under it for possible research was a good one. We should try to help students brainstorm their topic in order to cover as many aspects as possible. A topic should develop a student's interest. A good example of this was the middle school project last spring. Students were to pick a topic that interested them and do a project on it for "Discover '97." Many of them needed

guidance on what aspects to focus on and what possible resources they might try. Much of this could have been done in class before they came to the library.

If a topic doesn't develop a student's interest, it becomes just another dry report. There should be a lot of preparation before the process of research begins. Not only should it develop a student's interest, it should pose a genuine question and should ask for a higher level of thinking on the student's part.

In comparing books and magazine articles with Internet, I learned the advantages/disadvantages of each. With printed material, you can go to the library, check the information out, take it home and know that the material has been edited and is for the most part reliable. The disadvantages are that books or magazines needed may be checked out when you visit the library. If your paper is due tomorrow, you may be sunk. Computers with Internet, on the other hand, are always there with the information to be printed out. But watch out, you might end up printing out a ton of material that you will spend hours editing yourself.

Kids are sometimes so sure that the Internet will be their main source. They think they will have easy access and will find a lot of information. But this can backfire and they can spend a lot of time trying out various search engines.

I think I need to become very proficient on the Internet before I can teach students how to use it. I also am very dubious about having Internet on the one computer that our library will have. (The library is very small!) Scheduling usage would be a nightmare. Maybe it would be better to have it in the computer lab.

I like the list "Instead of . . . Why Not Try?" Although I'm not a classroom teacher, I'll keep this list handy at the library and will share it with teachers who assign research projects. It certainly opens up a whole new world of alternatives for projects. There should be something here to stimulate every student.

October 1, 1997.

The beginning of class reinforced the idea of preparation before beginning research. Students should brainstorm their topic by narrowing or enlarging it, and they should be able to list sub-topics that may help them with their research. Key words or phrases need to be written down so they can be explored when time for research begins. We, as a class, brainstormed several topics for practice. It can be a fun as well as a challenging task for students--and one that is absolutely necessary. When students are in the middle of research, they should see the need for this preliminary work.

Our trip to the SWCC [Southwestern Community College] library was educational, but I feel we needed more time in order to become more comfortable with the technology (OPAC & ProQuest). Those of us who tend to freeze when faced with new machines need more practice.

The S.P.I.R.R.E. research tool, the 6 A's of Information Literacy, and Doug's Four A's of Great Research Projects will all be very helpful to classroom teachers and librarians. Ideally, teachers can teach these processes in the classroom and librarians can reinforce them when students come to the library to do research.

The "Action Words" sheet is also a good one in that students may move beyond just reporting on a topic. More thinking skills are involved in contrasting and comparing, analyzing, evaluating, assessing, etc. Reporting is too easy for a student and too boring. I

think many times it's not that students find research projects too hard, it's that they find them too humdrum and take too little time in the advance thought process. It's up to teachers and librarians to help students see that learning can be fun and challenging. And a little extra effort up front will pay off. It's a nice thought anyway!

October 8, 1997.

I think the point that impressed me most during the October 8 computer class was that students shouldn't be allowed to surf the Internet at school. The Internet is not a toy, but an information tool. As a librarian who will soon have a computer with Internet at school, I feel that I need to get this message across to students. They should be taught special research skills to find the information needed for classroom use.

The best way to teach this message is to use the strategies that O.J. gives in the pamphlet "Searching the Internet." Students need to write a research statement, then make a list of synonyms for all the nouns in the statement. This broadens the scope of the search. They should then make a list of relevant adjectives that could make the search more specific. Using this method gives the student several avenues to use in researching a topic. Different strategies of word combinations (all thought out beforehand) will, in the end, save research time. And even though several thousand hits come up, if the preliminary work has been done, the best hits will be among the first ten or so.

The booklet we were given is very helpful and I'm sure it will come in very handy as I work with Internet and as I teach the search skills to students and perhaps other teachers. I have been in one of O.J.'s courses before, and by hearing the information a second time I feel that I understand it even better now.

I really enjoyed having the time to research the Internet and practice these skills. The class time gave me the desire to have Internet at home and to eagerly anticipate it at school. There's so much to learn!

October 22, 1997.

I enjoyed the chance to use the CD-ROMs last week since I have never really used them before. Now at least I will know some different kinds and what they include. I intend to file all of the handouts in a folder, and maybe as I get into computers more and work more with CD-ROMs and Internet, all of this will click eventually. At least I will have the information close at hand. Right now, I look at all the papers I have collected throughout the class, and it's a little overwhelming. I'm glad I've been exposed to it, however.

Student B

September 24, 1997.

Reminder: use research "problems" the students can apply to their own lives. Reminder: six-step model for information management. Teach students to focus on key words. Be aware of the questions I ask and how I present them. Students are apt to adopt my channel of questioning. If I ask tantalizing and divergent questions, students will be apt to ask the same type of questions. Create research problems that address a student development interest, pose a genuine question, ask for higher level thinking, and are topical or local.

October 1, 1997.

I loved the idea of showing beautiful books with pictures to stimulate interest in a research topic. The superintendent has a tendency to think of books as reactionary--he

thinks the library should be largely electronic. [I was] glad for a chance to use an online catalog. [I] have never used the Encyclopedia of Associations before.

October 8, 1997.

I really liked the process of writing out a search statement. The process of using nouns to enlarge the search and adjectives to make it more specific is one I had not heard before. The class was useful to me in that I spent much time experimenting with different search operators and combinations of search operators. The handout on search operators in "Searching the Internet" is wonderful. The pathfinder assignment frightens me. I feel that I'm still "experimenting" and have not "mastered" technique.

Eighth graders are doing a research project now. The teachers are doing it and I'm on the edge. The students have such an attitude about Internet. They say, "This library doesn't have anything. There's nothing here. I'll have to get on Internet." Then they sit down at the computer without paper or pencil or plan.

I have episodes of panic about this--the class, the pathfinder, and teaching Jr. High students effective search strategies. They do not see it as a task, but as a game, a stroll. I'm also worried that they are so uncritical of what they find and how they should use it. When I discuss these concerns with other teachers, they say, "But that's Jr. High kids." They think I worry too much. But I know there's a saying, "A little knowledge is a dangerous thing," and I think it is--dangerous. Simply to connect an idea or a bit of so-called information to a computer or the Internet lends it a force it does not deserve (at least in many minds). I gave the English teacher the Internet evaluation sheet. She will be discussing it with the students who are now researching.

October 22, 1997.

I really liked the idea of kick-starting the research unit with a wide array of attention-getting books--lures. I also think it is important for me to help students put their research into manageable chunks--as is the point of a pathfinder. I want to make up some pathfinders for my junior high students; however, they will need to be far simpler than the examples you gave us. I think librarians have a tendency to set extremely high standards. I know my library teacher at NWMSU [Northwest Missouri State University] did. Every three hours for the library degree was about as much work as six hours in the ed[ucation] department. Now, since I've been employed, each year I reduce expectations of the students. Research is such a complex process; it involves so much more high-order thinking than what students are used to doing. Not to mention it's work. It's also a lot of work for me and for the teachers. Many teachers do not want to change the way they've always done things. Teachers themselves sometimes bring what I consider a superficial attitude toward the library and toward research.

Well, back to the point--putting the process in manageable steps. This leads me to ask, What does the seventh grader coming through my door need as prerequisites? You see how complicated it starts to get? When should I have taught those students the foundations of critical thinking?

I'm very grateful for the handouts on evaluating web sites. Maybe I can use these with students. I will modify them if I get the chance to teach directly on Internet. I already gave one to the English teacher. I have really been struck by a comment you made in class: "If you ask tantalizing and divergent questions, students will be apt to ask the same

type of questions." I consider that bit of thought to be a very valuable thing to take out of this class.

The four criteria you gave us for planning lessons for the students: (1) It addresses a student development interest. (2) It poses a genuine question. (3) It asks for higher-level thinking. (4) It is topical or local. This gives me a neat, tidy formula to check against activities I plan for students.

Student C

September 24, 1997.

At the beginning of [school name]'s school term, the administration requires goals and objectives from staff. As a para-educator, the requirement does not apply. However, in a support librarian position, I felt the request valid. One '97-'98 administrative change altered the whole outlook of the library. Study halls are no longer offered. The library became, on paper, an information resource. The first new objective then became apparent. Study teacher lesson plans and find supportive materials for them. Goal one. Goal two was to re-categorize the card catalog as student helpers over the past years have altered the alphabet considerably.

The first "Finding Information in an Information Age" class addressed goal one in numerous ways. It taught me how to interpret teacher's unit plans and goals. It gave me a list of instructional objectives from an educator's viewpoint. It made me more cognizant of how the base is built from teacher to student to guide students toward reasonable inferences from material presented. It offered an "Instead of . . . Why not try" list to present to teachers to help them make material more diverse. Also, it taught me to interact with teachers to arrive at source conclusions more rapidly. The instructor provides the

questions and relevant data. I aid them in finding possible sources of information. Our audience is students. Our success is measured in continued library usage. In summary, compare, contrast, create.

October 1, 1997.

Class two continued the compare, contrast, create drill. Paired with a family and consumer science teacher, we worked on building an interesting unit for her life skills class under the general umbrella heading of "consumerism."

Working with her concern about the lack of basic knowledge in banking, budgets, and general monetary knowledge shown by her students, we decided to pick an area of consumerism that could potentially do individuals the most harm in the shortest period of time. The research problem then became credit cards. Key words related were debt, debit accounts, consumer credit, perk cards. No subject headings were found in ProQuest relating to specific brands of credit cards--i.e., VISA, MasterCard, Sears. Interesting subjects quickly thought of were how compounding interest works, why credit cards are so easy to get for some (jobless college graduates) sectors and so hard for others (employed, but without income requirements).

Another sub-topic of credit cards could be the turning tide of consumerism in the U.S. There is a subculture coming to surface based on the thought pattern of trading hours for dollars. That is, before every "non-essential" consumer purchase is made, mentally think how many hours of labor must be performed to equate to the dollar cost of the non-essential.

Credit cards in consumerism passed the Four A's of research projects. It is an assignment that matters (credit card companies target younger and younger audiences);

activities that involve (how to read a credit card statement--what does it mean?); assessments that help by promoting growth (an audience beyond the teacher, students teaching parents); and attitude is everything (the rate of change is long term). Being introduced to the Encyclopedia of Associations was quite helpful.

Also, this week I used the elementary library for high school students for the first time. One unit of study was informational speech (5 minutes to inform and interest fellow classmates). One student chose the topic "dinosaurs." The elementary library had many more volumes than the secondary. The second was American literature and The Crucible. As a secondary unit of interest, a report is being requested on the topics of either the Salem witchcraft history or McCarthyism. Our elementary library is combined with the middle school library and had a much larger selection of the Salem witchcraft history.

I also shared with an American literature teacher the "Instead of ... Why Not Try" list, the key word search, "My Search," and "Focus Frame" handouts. A very successful week.

October 8, 1997.

As I was going through my "Library Materials" folder, I ran across a copy of the "Searching the Internet" handout--identical to the October 8th class handout. The handout had been given to me earlier this year by the head librarian. The poignancy of this duplication is that if you don't use it, you lose it. So while I had the Internet shortcuts via Booleans all along, I had no idea what the application was. I supposed it was another list of web site addresses . . . of which I have enough now to fill a book.

The intent of Day 3 Class--Internet Resources--was very helpful. Just focusing on the Internet as a research tool rather than a form of entertainment was insightful. Since

then I have read Teacher magazine, October 1997. (Seems I always go back to print for some reason.) The article was entitled "The Web and the Plow." It was written by Lowell Monke.

The author believes that the computer itself is an inappropriate tool for some ages and educational endeavors. Our "Finding Information in the Information Age" instructor teaches us that as well. Mr. Monke also believes that the computer comes with some hefty psychological and cultural baggage. The concept of "liberal" or "conservative," for example, must have some basis for understanding. Mr. Monke suggests that the computer distances us from what we are learning. That is the cognitive distance of firsthand experience. "The computer alone filters out the rich context that direct experience provides."

So while I had the Boolean shortcuts all along, I had no cultural reference for them. It took classroom instruction. Learning is more than what is material, mechanical or measurable. Direct experience is more meaningful. Go, therefore, and seek reference. Not to stray from the pathfinder of consumerism, credit cards, I believe there is plenty of "material" life experiences to work from there.

October 22, 1997.

Measurable, Mechanical and Material. According to an article entitled "The Web and the Plow" in Teacher magazine, October 1997, these three M's define our schools' current love affair with computer technology. Our society's willingness is to reduce learning to that which is mechanical, material and measurable, to the extent that the reading, writing and arithmetic plows are overlooked as the fundamental tools.

The author, Lowell Monke, believes "computers filter out the rich context that direct experiences provide." Short of asking the age-old question, "If a tree falls in the forest, does anyone hear?," Mr. Monke contends that education's goal was once to discover meaning. Discovery has been replaced with searching . . . for resources. Teaching use of good judgment has been substituted with a reliance on data analysis. The generation of ideas is now the slick packaging of others. Learning is equated to measurable volumes of information, without assimilation.

The course "Finding Information in the Information Age" has thus provided a valuable lesson in the industry of education. The lesson? In certain applications it is better to be behind a horse-drawn plow than a John Deere.

From the beginning of the course, a pathway was established, the goal of which was to write a classroom unit. Topics were chosen and made relevant. Resources necessary to support this unit were searched out, drawn upon, and compared for validity and interest.

The "Web and the Plow" article turned on the light. The classroom unit we teachers, librarians and para-educators should be incorporating is "Finding Information in the Information Age." How to FIND and EVALUATE. How to teach good judgment from the vast resources available. The model is in place and has been presented.

Finding and evaluating data is a powerful tool. If we cannot all share the direct personal experiences Mr. Monke feels are missing from education, we can share through others' eyes . . . as long as the eyes through which we are seeing are reliable and if not reliable then soulfully imaginative.

Students are taught at exceedingly younger ages the mechanics of computers. Why not teach evaluation methods at the same dizzying pace?

Week one we learned how to define the problem and enhance the subject matter. We were shown how easy it is to integrate curriculum, as much of curriculum overlaps. We received the "Instead of . . . Why Not Try?" list which showed directions to turn for adding activities to a project or unit. Why not try this? Where would that lead?

Week two a key word search exercise was performed. A zooming in outline was presented. How do we use print resources effectively even before computer offerings are introduced. The Big 6 problem-solving technique. Doug's 4 A's of great research projects. And action words.

Week three was the introduction of confusion! How information can get away from you. The Internet, sites of note, references, sizing up, critical evaluation, pathfinders. So much information, so little time! The lessons of week one and two became critical. Don't let this project get away!

Week four. You be the judge. The difficulty of becoming a non-teacher. Let the students be the judge--throw out, keep; keep, throw out. At this point, the difficulty became more apparent in measuring information against a standard. "You be the Judge" and several other evaluative form handouts were valuable. The resources list for educators is also a valuable list. All the time sorting, comparing, creating with a subject in mind. The evaluation forms at least give direction in comparing computer data.

In summary, finding information in the old industrial or new information age is still a critical process. That hasn't changed since the plow.

I am now better equipped to fulfill my '97-'98 school year goals of filtering information to support faculty in their lesson plans and units of study. I can find resources more rapidly. Some references are just more appropriate than others. Some areas of resource just aren't as fun as others.

And in response to Mr. Monke's education theory, I'd like to add: judgment just won the round with data analysis. Meaningfulness over the research search.

At the conclusion of this course, the next task is to find the appropriate class, the overlapping curriculum, and to convince the administration that the Finding Information Pathway fulfills students' education needs.

Student D

September 24, 1997.

I thought the first class session went very well. The handouts and some of the class activities we did were very good. I think the activity on the Information Problem is something that could be done in the classroom so that students could become aware of the many sources of information that are available to them. I also feel that the activity with the questions on the sticky notes could be very useful as well.

I guess overall I am somewhat confused though. I thought this would be more hands on as far as actually learning how to find information on the Internet, using the CD-ROM, SILO, etc. I am very unfamiliar with these and really would like to know how to use them so I can help my students use them. I also feel that there is a great deal of work to do for only one hour of credit.

October 1, 1997.

I found the second class session to be much more interesting because we were actually using some of the resources that I am totally unfamiliar with. I did get very frustrated when I was having trouble with the Internet trying to get through to UNI. I guess that is why I don't like to use the computer. I have very little patience when things don't work the way I think they should.

I really liked the Encyclopedia of Associations. I think this would be an excellent source to use.

All in all, I though the second class was much better than the first. I think the assignment we had to do that night was too long. I'm not even sure I got done with the whole thing. Parts of what I did get done I know I couldn't do again because we had to go so fast since the library was closing. I think a review of all that would be good at another class session.

October 8, 1997.

I really enjoyed the last class session. I thought it was very good practice to search the Internet, and it is something that I will use in my classroom. I thought that all of the ideas that O.J. had were good, but I know I would have a hard time following all the steps. I would probably try to find a quicker way to do the search because with my schedule I don't have a lot of time.

I am still a little confused about the unit assignment as well as the pathfinder. I guess that the four of us have four different ideas as to what you want from us on those. Maybe you could really clarify that during this session.

October 22, 1997.

The last class session was very helpful. I worked with [name of partner] and we were finding information on capital punishment. We used the Grolier's and the Compton's Interactive encyclopedias. Both of these were very easy to use and both had a great deal of information. Both of these sources had up-to-date material and I feel that these are fantastic resources.

I took a look at the A.D.A.M. Essentials CD this past week. This is an excellent program and I think it would definitely be useful to my anatomy students and I would be able to use parts of it in biology as well. I think I will try to get this program for next year.

All in all this was a very interesting class. I really learned a lot about finding information. Some of the sources we looked at I had never even heard of. And it is good to know that even though we might not have certain things in our school, that students can use the resources at the AEA.

I really need to do a better job just giving my students better assignments, like when we talked about making sure the assignments have some real value, how does it connect to the real world, give local topics, and making students use higher-order thinking skills. These are all areas that I need to work on.

I think the problem solving assignment was something that I would like to use in class to show students that there really is a logical way to solve problems and to find information. I also liked the little thing we did with the sticky notes. That is also something I might do.

Every year all the science students in grades 7 through 10 must either do a research paper or make a science fair project. I think this would be an excellent place for

me to use the knowledge I have gained in this class to help my students get the information they need for their projects. If they do a research paper, it usually needs to be five typed pages and I tell them that they need at least four sources, only one of which can be an encyclopedia. All of the strategies and resources that we have looked at would come in quite handy for this assignment.

I really liked the idea the one lady had as far has having all the students take a course on finding information. I think that would be must better than if two or three teachers are trying to get students to find information three different ways. I think that would be very confusing.

During this class I realized that our library materials are really outdated and are really quite limited. For the most current information, our students would have to go to the Internet.

Like I said before, the class was very informative and I really did learn a lot. There is no question that Karen and O.J. both know their stuff when it comes to finding information. I liked all the hands-on activities and now I at least know a little about all the resources that I have available to me.

Student E

September 24, 1997.

Some confusion as to what the class was about in several people's minds, including mine. First activity: Group work--information problem. Our group chose attending a movie. Activity was good in that it shows how we organize and gather information in order to make a decision.

Second activity: Worked with a partner to prepare questions that we would want to ask if doing research on a particular topic. I particularly liked the idea of putting the questions on sticky tabs and then categorizing them. I thought this was a good way to organize and see what you were not covering. Good exercise!

Third activity: Worked with partner to decide where to look for certain instructional objectives. Good activity for sources of information.

Homework assignment. My reaction: Too much for one hour credit!

October 1, 1997.

The first 45 minutes were held at the AEA and were devoted to discussion of our assignment which we turned in. This was good follow up. Karen is very organized. We also received several handouts which I haven't had a chance to look over.

We then went to SWCC's library for the remainder of the time. We paired up and did research on our topic using OPAC, ProQuest, and print resources. This was good but possibly a little too much in the amount of time we had. I think it would have been more effective researching only one and doing it more thoroughly.

I do think the assignments are a bit too much from week to week. Much more than any other one hour credit I have ever taken. It's not that I'm lazy, but when you have five different preps and coaching, it becomes quite a burden finding time to do a thorough job.

October 8, 1997.

The majority of our time was spent searching the Internet. It was time well spent. O.J. spent considerable time emphasizing the importance of writing a statement of exactly what you want to find and then breaking that statement down into other possibilities. He then took time to show us how to find things quickly on the Internet by narrowing or

broadening our search. This was very helpful. The rest of the time was spent on the Internet using different search engines to find what we were looking for.

October 22, 1997.

We spent the majority of our time on October 22 looking at CD-ROMs and evaluating them. This was interesting and very helpful. [Another student] and I looked at the Compton's Interactive, Grolier's and Encarta 95. I found all of these to be useful for the topic which we researched. I had several pages of good information on capital punishment printed that I can use in my government class.

I evaluated the CD-ROM American History. This was very good. It was easy to access and had excellent information and detail. I found this to be very useful and intend to make use of this more for my American history class.

In doing research for my unit on capital punishment, I found that the Internet was the best source of current information. Most of the sites that I found were reliable and easy to access. I found many sites that were good sources for pro and con arguments. The print material that I found was not as current, but much of it was still useful for developing arguments. The encyclopedias in our library were probably the poorest sources that I found. The CD-ROM encyclopedias were good sources and much more current. I used the Readers' Guide [print] in our library and found some good information, but it was time consuming. I would still recommend that students explore this as a source. The best and quickest source for current articles was in the H. W. Wilson Readers' Guide.

In using this topic for my government class, I would want them to first get some factual background. Once they had done this, I would want them to pick a side in the

issue of capital punishment and do their research based on this. I would then allow them to debate this topic and present their arguments.

I found this class to be very useful. I know that I learned a lot that I definitely will use. Both O.J. and Karen are very knowledgeable and effective instructors. It was very much appreciated that the instructors were willing to modify the final assignment. I don't think that it took away from what we learned from the course. It was definitely one of the better classes that I have taken.

Student F

September 24, 1997.

The information provided about the class was misleading to several people. I thought it would be more computer oriented. Some review of other sources may prove useful.

The task of using the sticky notes to arrange questions for research was a useful tool that could be applied to the classroom.

The information problem is very detailed and I think most of the kids I work with would be confused and think it was too much for them to process. However, parts of it would be more productive.

Working with a partner to decide whether instructional objectives were drawn from a curriculum guide, a state-adopted course of study, or a list of library skills. This did make us think a bit and several overlapped.

Homework: I don't see the journal as a necessary step in completing the course for one credit. Most people do not have a lot of extra time and I see this as "busy" work.

October 1, 1997.

The technology was wonderful; however, coming from a small school, we don't have access to such information. We do have the Internet that may be useful when we learn how to use it.

Encyclopedia of Associations was a new source to me. This could be a valuable tool for extra resources.

In looking at the three print encyclopedias, I felt like I was in the stone age. Although they can be a good source, our school does not have updated material. We have invested in a current CD-ROM encyclopedia.

I do hope that the remainder of our time will focus more on the technology part of finding information since that is what our kids need educated on. There is so much out there they need to learn how and where to look for information that will help them in completing assignments.

October 8, 1997.

The process of how to access information on the Internet was useful. Although I have been through the Internet class, the lapse of time creates holes in the knowledge I learned through the class. When one does not use the information learned, it is easily forgotten. This session has probably proven to be the most helpful because it is the information that we need to understand in order to pass it on to the students. Finding information on the net can be very confusing unless we have some type of guidelines to follow. It can hurt us more than it can help (especially under the time restraints we have). Being able to analyze the web site is also something we have not had any training in. With so much information out there, we need to be able to learn what is a good and bad

source. We did not get a chance to use ERIC and SILO; many of us really wanted to explore these resources to discover what they have to offer.

October 22, 1997.

We spent this session embarking on software programs off CD-ROMS. This was exciting to explore because our school is limited to Grolier's Encyclopedia as a source helpful in the realm of researching. I got to experience using Compton's Interactive Encyclopedia. There were differences between it and Grolier's. Compton's seemed to offer more information on our subject. It was, however, slightly more difficult to use from the start. The Electric Library (for the Mac) was also a good source, although limited in what it can do. It is also cumbersome in only having one choice at a time. However, the limitations you could place on the search (like date, specific source--newspaper, magazine) was wonderful in trying to pinpoint current or more specific information. The Wilson database was much easier to use than the original periodicals. It does pretty much what the books do. Although we were exposed to a great amount of hands on, the best part is knowing where to look for sources. This gives anyone a wonderful head start for doing research.

After being exposed to all these new avenues of information sources, it's time to see how to use them in hopes of benefiting the students. Topping the list is talking to the principal and expressing a need for all students to be trained in how to do a search on the net. Even though some teachers touch upon it, we are not getting uniform instruction that would best benefit the kids. Also, we have already mentioned that we need some new resources for the library. Our principal agreed our library needs updated and is open to hear the information we can provide from our class.

I plan on using the ideas and sources on a geography unit that I team teach. The students have to do a lot of researching and use a variety of sources to find information. We have the kids (grouped in 4's) pretend they are on a tour throughout major cities in the U.S. and abroad. They are responsible for reporting on the following: how and where to obtain a passport, visa requirements, required shots, monetary exchange, language, culture (including food), background, why the city is famous (why people would want to visit), city nicknames, time zones, culture/customs/traditions, climate/geographical features, clothing they would take, and lodging information. (We are still reconstructing how we want to do it for this year.)

I would like to use the sticky note activity with the kids to help them organize what they want to find and how to group the information. Next we would brainstorm possible sources for them to use in their quest. They will need a broad realm of sources from people, books, the net, computer access, agencies and organizations. Of course we will present what we learned to the students as possible resources. Even though we may not have some of the sources, we can direct the students where to go and where to possibly get them. Using several of the universities and colleges around us as a place to visit for information would be helpful too. Upon finishing this, we would then move in to how to do a search on the Internet. Only after this will they be able to perform searches that will be effective. We would demonstrate how to go through the whole process starting with the search statement. Next, progress to choosing the key words and finding synonyms for them as well as adjectives that could possibly make the search more specific. The Booleans would then have to be explained. We will need to stress the importance of using different engines and, therefore, give students the addresses of the various search engines

or provide a page with icons/buttons that link to them automatically. Another approach would be to bookmark the search engines as well. The students would then practice doing the process by drawing topics and then coming up with a search statement and performing the rest of the procedure.

The information I learned from this class is precious. Karen and O.J. have broadened my knowledge base so that I now feel competent in doing the same for my students. Beside all of the technological information, many traditional sources were presented that are new to me. I particularly liked the Sears' List of Subject Headings. If I remember correctly, this can help broaden/narrow a topic as well as give possible suggestions to students on what they can research. The Encyclopedia of Associations is another source I was impressed with. This is a source where students could contact to receive "valued" information. The idea of the pathfinder is also a good idea. With the students I work with, who get lost quickly, this would provide a super step-by-step progression in finding information about a topic. I have not used this yet, but hope to pout it in to use during the second semester when I have more time to prepare one.

Student G

September 24, 1997.

The word "research" bothered me a lot. It is probably because of the type of "research" assignments given to students in our school (i.e., for research papers and science fair projects, both of which involve a lot of formal writing). My goal in this class is to learn to use the variety of "resources," especially the technology resources, and to utilize the resources much more in my FCH/health classes. I figured I would be forced to learn to use the resources through this class, where I would put off learning to use them

on my own, with other things taking priority. As the evening progressed, I think that my goal will be achieved, and I certainly don't plan to do formal writing for a part of this class.

I like the sticky note technique for having students generate information--too many times I tell them where to go for information instead of letting them find it. I also was surprised by the working of the assignment. It had not occurred to me that many of our assignments encourage the copying of information.

I have employed some of these techniques with my high school class as we are currently working on the body systems. It has made a big difference in the quality of work done by the students, even in just one or two class periods.

October 1, 1997.

I believe I could sum up the entire class in one word: Frustration. The frustration came from several sources. First I felt very rushed and that the work we were doing wasn't that important because we could just hurry through it and that was OK. Not to criticize your teaching techniques, but the evening took a negative tone from the moment we began. When you prefaced the evening by telling us how much we had to do and that we would not do this exercise in its entirety because there wasn't time or that one, I felt that a negative tone was set. If the material was important enough to be introduced, then it was important enough to do in its entirety. I understand you are trying to cover a lot of material, but maybe there needs to be some more selection done as to what is really important for this course.

I was also frustrated with the computer work. There wasn't enough time to is complete the work, the computers were slow, and the sheets we used were confusing. When I do computer work, I like to discover and do trial-error. My partner was too concerned about doing it "right." I understand the merit of pairing us up, but I find it frustrating. I realize students also find it frustrating sometimes, and maybe that is part of your plan--to frustrate us in the same way we frustrate students.

I am also concerned about the amount of assignments and work we are required to do for the class. My motive in taking this class was to USE the resources to develop proficiency, and to become familiar with them, not to write a lot of papers, even if they are short. I expected to do a lot of in-class activities, but not the assignments, or so many of them. I don't know if I could use the SWCC resources again or not, or if I even have a clue what we were doing as we worked through the exercises. Again, frustrated and confused probably sum up the evening.

October 8, 1997.

Today's class was finally what I had hoped to achieve in this class. We had time to actually do the Internet work, and O.J.'s preface directions were very clear and understandable. At long last I was able to just take some time and do a directed search for information on the Internet. That's the positive. The negative is the frustration that I feel because we are LOADED with assignments. This pathway thing is overwhelming and to do a unit with objectives and activities is not what I wanted from this class. Also to put together a bibliography is beyond what I want to do. I have my classes using Internet searches for specific information, and our school librarian is giving a presentation to direct their searches so that all students 6-12 have the same directions and information

about Internet searches. I can't believe the amount of work for one hour of credit, and I can't believe that there is not a difference of assignments for those taking the class for graduate credit and those taking it for re-certification. I'm to the point that I probably won't finish the class because I don't have time to do all this stuff and, in so doing, get behind in other areas of more importance to me. I don't need the credit, and I certainly am not going to lose any more sleep over it. I will not recommend the class to anyone the next time you offer this class. Be sure the requirements are in big print at the beginning of the description of the course so that others are not fooled. Be sure that the part about homework says that there will be more hours spent on homework than in-class contact time. If I had wanted a three-hour library course from UNI (which is what this seems to be to me), I would have signed up for one. I feel sorry for the library people in the class who do not teach and do not have to do lesson units in their daily work. I hope the others in the class are having a better time and less frustration than I am.

October 22, 1997.

Reflections for this class have been less than kind due to high stress level. Probably you wonder why I ever took the class when I have been so negative. I HAVE learned a lot which will be useful in my classes, and I have achieved my purpose which was to force myself to use the technology by working through activities in class each week.

Perhaps one of the most valuable things came from the first week when we discussed how to give assignments that had meaning and relevance and assignments that forced students to use some thinking skills rather than just copying information. When I

made the health assignments on the body systems, I tried to give a better assignment, and judging by the way the students are working on the task, I think it has been successful. I posed lots of questions for them to think about and try to find answers. At least I got them thinking about things rather than just rote memory work for a "canned" answer.

A second valuable thing which I learned was the searching vs. surfing strategies. It was especially good when our day-long AEA in-service reinforced the exact same skills. Believe it or not, our students were very receptive of the strategies. When we finally went to the Internet for information (only after using lots of other sources), the students were prepared with specific questions, synonyms, adjectives and were able to do a much more directed search. Our librarian gave about a half hour preface before we began. (Thank heavens for the block system which then allowed us to do the immediate practice after she had finished.) The students concluded that the Internet was not the best source for most of them to find information on body systems. Update information on specific diseases was available, but we were not focusing on specific disease information. They were not sure that the time spent searching was worth it because they had found good information in other sources. They were able to figure this out for themselves. We spent about 45 minutes on the Internet, where in past years we spent 3-4 class periods and still found nothing.

For the health information, the CD-ROMs were a valuable source. Bodyworks was the best and the students found this out for themselves. It was the most user friendly. We also used The Doctor and A.D.A.M. At a before-school in-service, our staff had looked at various CD-ROM disks and did an evaluation sheet for each. These are

compiled into a book in our reference area. We did some evaluation of AEA CD-ROM disks, some of the ones which we own personally or some that are owned by our school. Our FCS group around the [name of] area meets and shares information monthly and we discuss good resources also, with CD-ROM disks being some of that shared material.

One thing which is still a frustration is all the electronic library material. We went through these materials so quickly that I don't know what is what and wouldn't know what to ask for. I think I could use it if I knew what to ask for when I went to a library because most of the computer materials give step-by-step directions and "help" sections. I still don't know what reference materials are available in a regular library, so now I am even more confused with the addition of the electronic resources that are available. What I probably needed was a good library course in high school and one at college. The ones I had were taught as memory work, and I have very little clue what is there. I think in this aspect, the librarians in the group should have had a definite advantage. And maybe that is their job and, as teachers, we should team up more with them and rely on more of their expertise. Perhaps just recognizing the expertise of librarians (they are no longer the little old "book" ladies) and giving credibility to library science would be an area to work on. Our school librarian is very good and will work with teachers. We also have excellent people in technology so that we may have a head start advantage.

The other thing which poses a problem for me is that although we have lots of technology in our school, access for my classes is a problem sometimes, and I need to get more creative with ways to get to the technology. Through forcing myself to use the technology in this class, it was easy to get excited about some of the things and to want to

use them in my class. Now I will have to get creative to figure out how I can combine my class (who would love the use of technology) and the availability of the resources. I think it tended to move and shake me from some of the complacency and to get excited about what I can do.

A final plus for the class is that I always enjoy networking with other teachers and the time spent sharing is invaluable. Since we all wear so many hats and have such busy lives, it is nice to have an opportunity to just get together and talk.

Student H

September 24, 1997.

The information problem that we did at the beginning of class included steps to get us thinking in broader terms about where we could go to find information. Brainstorming in a group was good.

I liked the last activity we did where we brainstormed questions we would ask to get more information about a topic and then categorized them to determine which questions were of most interest to the students. I think I will use this next semester with my eighth grade students when they do reports on specific drugs and present the information to the class. This semester I gave them the questions I wanted addressed and very few of them answered all the questions. They seemed to stop after they found one or two topics and reported on that information only. Maybe if they come up with the questions, they will be more apt to find them all. This will be interesting to see how it works out.

Modifying the assignment to address student interest is a top priority to make it meaningful to them and help them learn. It is our duty as educators to make sure the assignment poses a genuine questions, asks for higher-order thinking skills.

October 1, 1997.

The review of material presented in the last session, homework assignment, and journal were good. I am glad to know what some of the terms mean when they talk about SILO and OPAC and ERIC.

Beginning to think in broader and narrower terms helped us when we were looking up things in the library because we could not find enough information under contraceptives so we had to look up birth control devices.

The focus frames activity was an interesting way to begin a research project. It is something that could be very beneficial, especially to middle school age students.

I think the information we were able to access tonight was wonderful, but I did not think we had time to process it or even search for items that would be of interest to us in our subject areas. I was too concerned about finishing the assignment in the time allowed and so I felt rushed to get through the steps. I also feel this class should be more than one credit hour because of the amount of outside time that is necessary to fulfill all the requirements.

October 8, 1997.

This sessions was very beneficial. It is more what I expected out of the class. I liked the time we were allowed to work on the Internet. The tips on how to write terms for an effective search have been a lot of help to me even in these few days. I am

somewhat confused as to how the pathfinder can be used in the classroom and the purpose of it, so I hope this is answered in the next session.

October 15, 1997.

I have already used some of the techniques you taught during this five-week course. I immediately began thinking about my small report assignments and evaluated if they addressed student developmental interest, posed a genuine question to the students, and asked for higher-order thinking skills. I decided that the assignments I was giving for reports were too teacher oriented and Karen and O.J. helped me to develop at least one of these assignments to be more student oriented and to guide the student toward using higher-order thinking skills.

I used the sticky note idea to get them to develop questions they would like to know about the topic. Some students needed guidance to come up with pros and cons of their topic because they are so used to being given exactly what is expected of them, but others had all the information plus some. The result of this was that they were able to answer all the questions and turn in a complete report. I am anxious to try this with my eighth grade group as I did not do it with the first semester group and the results were not good. That will be a true evaluation of how well it works.

I also taught, or attempted to teach, these students how to effectively search the Internet for their topic. I rushed through this part of the instruction and the results showed this. I had one student type the question in for her search but she came up with two very good hits right away. I need to bone up on this part of searching before I teach it again. I really like the idea of teaching all the students this technique and we may try to get this done in our school too.

I have talked in depth with our English teacher about this class and the implications it would have for her research paper assignments. At first, she did not think it would be of much help to her because she is already aware of resources available, but as the class progressed and we searched more resources, she is quite interested. I have shared the pathfinder with her as a tool for use by students in finding useful information for their research paper. I found the Electric Library especially interesting because I did not know there was such a search tool available. I went back to our school English teacher and told her about this option. She seemed interested but wanted more information, especially for searching newspapers.

We also went back to our school and discussed updating our research information, both print and non-print. Our principal said to research the different types, get a price, and get back to him as there is money available through technology funding.

At first, I did not know if this class was going to be a help to me in the classroom, but it has already made me reevaluate how I assign small reports and helped me modify assignments to be student centered.

Appendix C

Workshop Evaluation Tally Sheet

1. How would you compare this staff development workshop to courses taken at a college or university?

5	3	
of greater value	of equal value	of less value

2. Will this workshop have a practical effect on my becoming a better teacher or administrator?

8		
yes	uncertain	no

3. Did the scheduling of this workshop represent a valuable service in terms of location, convenience and cost?

7	1	
yes	uncertain	no

4. Why were you enrolled in this workshop? You may check more than one.
   a. 7 To meet a personal growth goal.
   b. 3 To meet a building or district identified goal or need.
   c. 5 To earn credits for re-licensure.
   d. _____ Requested/required by administrator/district.

5. Was the instructional style of the workshop student-centered?

7	1	
yes	uncertain	no

6. Would you recommend this staff development workshop to others?

8		
yes	uncertain	no

COMMENTS:

"Would recommend if you restructure a little to take out the glitches."

"More hands on time. Information was good."

"I would recommend and have recommended this course to our high school English teacher and librarian."

"Very good! I learned a lot!"

"Excellent applicable material."