

Current Themes Regarding Library and Information Skills Instruction: Research Supporting and Research Lacking

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The following column is a revised version of a paper originally written for the Treasure Mountain Research Retreat, Park City, Utah, 1989 (Woolls and others, 1990. I also presented a version of the paper at the Information Skills Preconference at the 1991 ALA Annual Conference in Atlanta.). The overriding conclusion is still true, namely, that there is a critical need for research related to library and information skills instruction.

Instruction in library and information skills is widely accepted as one of the major functions of the library media program. Support for this teaching role is found in the mission statement of *Information Power*, “to ensure that students and staff are effective users of ideas and information,” and in the first articulated objective, “to provide intellectual access to information through systematic learning activities which develop cognitive strategies for selecting, retrieving, analyzing, evaluating, synthesizing and creating information at all age levels and in all curriculum content areas.”(1)

Four major themes about library and information skills instruction are assumed within these two statements. These themes represent widespread current beliefs about the value of library and information skills, the nature and scope of skills instruction, and effective approaches to teaching library and information skills.

- Instruction in library and information skills is a valuable and essential part of the school’s educational program.
- Essential library and information skills encompass more than just location of and access to sources. The skills curriculum should emphasize general information problem-solving and research processes and the specific skills within these general processes (e.g., selection, analysis, synthesis, and evaluation).
- Library and information skills should not be taught in isolation. The skills program must be fully integrated with the school’s curriculum.
- The use of innovative instructional methods and technologies can enhance the teaching of library and information skills.

Few persons associated with the library media profession would disagree with these fundamental assumptions about the instructional role of the library media program. Of course, it is worthwhile to provide instruction in library and information skills. Certainly, students today need to learn what to do with information and not just how to find it. Additionally, both experience and

intuition lead to the conclusion that students are more likely to retain and use skills if they are taught in conjunction with actual classroom content. Finally, library and information skills instruction will certainly be improved by utilizing modern instructional technologies and methods.

These four themes represent understandings and assumptions that pervade the literature, state and local standards and curricula, and guidelines for library media programs at all levels. Many seemingly excellent library and information skills instructional programs are built on them. Still, the following critical and difficult questions must be asked:

- Do we really know these themes to be accurate?
- Is there hard evidence to confirm them?
- Have they withstood careful scrutiny by researchers?

Common practice and intuition are not enough. If teachers, administrators, and school boards are to make a commitment to developing library media programs, they need research facts about the importance of library and information skills to overall student performance and achievement. Also, if library media specialists are to deliver effective skills instruction, they must be able to draw upon documented conclusions about those skills that are most important and the approaches most likely to result in success.

The purpose of this paper is to review the status of each of these themes from a research perspective. What research is available and what do the studies say? Which aspects of these themes have been investigated and what conclusions have been drawn? How strong is the evidence supporting these themes, and can reliable and valid conclusions be drawn? And if evidence is lacking, what seem to be the major questions and issues that must be answered? Time and space make it impossible to cover all related studies here, but an earnest attempt is made to cover a range of relevant research.

Theme 1: The Value of Library and Information Skills Instruction

Because the overall issue of the value of library and information skills instruction for students is so crucial, one would expect to find abundant current research on this topic. Yet, there are a surprisingly limited number of studies that directly focus on questions of impact and worth of library and information skills instruction. In Didier's (1985) substantive review of more than thirty-five research studies relating to the impact of library media programs on student learning and achievement, she reports results from only six studies that directly focus on the value of skills instruction, none more recent than 1974.(2) Summarizing from all studies, Didier concludes that various aspects of library media programs can have a positive impact on student achievement. The research specific to library and information skills instruction confirms that knowledge of library skills can be related to improvements in student achievement, performance on standardized tests, and grade point average. Didier states that skills instruction and general library media programs can make a positive contribution to the "development of reading skills,

overall academic achievement, library skills, vocabulary and word study skills, verbal expression, problem-solving ability, and breadth and quality of general reading.(3)

In more recent research, Gifford and Gifford (1984) examined the effects of a two-week library skills instruction unit upon seventh graders.(4) The two evaluation measures were frequency of use of the library media center after the unit and amount of help requested after the unit. “Results of the study indicate that teaching a two-week unit on library usage did significantly increase the total usage of the library....(5) It was also found that the experimental group requested assistance significantly less often than the control group, fifteen times versus fifty-one times.

The positive influence of library media instruction on achievement is also supported by Gilliland’s (1986) finding that an ongoing library media instruction effort aimed at reviewing and reinforcing “study-locational” skills improved student scores on the study-locational portion of the California Assessment Program Test.(6) In her studies on the research process, Kuhlthau (1989) reports that the way in which students go through the search process affects their confidence and their final products. Increased confidence relates to students learning more about their topics and developing thoughts about the topics. Higher confidence correlates with more focused papers that also receive slightly higher grades.(7)

In her doctoral thesis, Goodin (1987, 1991) looked at library research skills and the issue of transferability of skills from high school to college. High school students in college preparatory English classes were divided into experimental and control groups. Both groups received pretests on basic college library information knowledge, a research paper assignment, and a posttest. A Likert-type attitude scale was administered to all high school students and again to selected students during their first semester in college. The experimental groups also received a series of lessons on the research process taught by the high school library media specialist. The program of instruction was based on recommendations of sixty-two college faculty members. Goodin found that the high school students who received instruction scored significantly higher on the posttest than students who did not. In college, students indicated that they were able to use effectively the skills learned in high school to conduct research for courses. There were no significant differences between groups on the attitude questionnaire, perhaps reflecting the inability of this particular instrument to measure transferability.(8)

Garcha and Gatten (1990) also studied library use by college freshmen, comparing use and needs of traditional students (those entering college from high school) and nontraditional students (those students returning approximately ten years after high school). The study found that traditional students are more likely to have had formal library instruction, use library resources, and ask library staff for assistance. In terms of library instruction, both groups had positive attitudes toward developing library skills through formal instruction.(9)

In summary, there is some research to support the contention that library and information skills instruction has a positive impact on student achievement and overall skill development. Library media specialists can point to these findings in their efforts to acquire the support and resources needed to develop quality instructional programs.

Additional research is definitely needed to explore this theme fully. Kuhlthau (1989) points out that library media specialists have difficulty measuring the impact of library use on learning and that further research is required on the influence of information search processes on student products.(10) More specific questions for investigation include the following:

- Does library and information skills instruction contribute to student achievement in specific subject areas as well as to overall student achievement?
- If so, how can the impact of library and information skills instruction on the achievement of specific subject area learning objectives be measured?
- Does library and information skills instruction influence student attitude and motivation?
- To what degree does library and information skills instruction at one level influence performance at subsequent levels?
- To what extent does library and information skills instruction at levels K-12 impact on college performance and on lifelong learning?
- Does library and information skills instruction require changes in the information environments of schools? For example, it seems clear that changes in technology will cause changes in the types of information resources offered. If students develop improved library and information skills, does this require likewise changes in resources, systems, services, and roles of teachers and students?

Theme 2. The Nature and Scope of Library and Information Skills

Understandings in this theme relate to the content of library and information skills. What does the library and information skills curriculum encompass? What specific skills are to be taught? What are the choices for overall frameworks or models for skills instruction? Is one framework preferable to another? What is the relationship of the library and information skills curriculum to subject area curriculum; where are the boundaries and overlap?

Traditionally, library instruction focused on skills related to sources: locating, accessing, and using sources. These isolated, “library-dependent” skills were frequently taught out of subject context, without any formal, articulated curricular framework. Later, library media specialists developed scope-and-sequences of skills, although most still emphasized a source approach.

In recent years, a new approach to skills instruction has emerged, one that centers on a process approach to library and information skills. This approach is not dependent on any particular source or library. The emphasis is on developing transferable cognitive skills that should increase students’ effective use of information in general as well as their use of specific libraries and resources. Recent examples of the process approach include Kuhlthau’s (1985) process model for library research;(11) the “Big Six Skills” information problem-solving framework of Eisenberg and Berkowitz (1988);(12) Irving’s (1985) use of information and study skills to deal with assignments and other student information needs;(13) and Stripling and Pitts’ (1988) description of library research as a thinking process with ten steps.(14) All these works share the belief that specific library and information skills should be taught within the context of an overall process.

Unfortunately, with the notable exception of Kuhlthau, these and other process models for library and information skills were developed without any formal research. While most were developed after the authors had years of practical experience working with students and meeting their needs, the models are not empirically derived or tested in any formal field or laboratory study. Although this fact does not necessarily detract from the importance or usefulness of these works (after all, the author's own work is included in the list), it does point out a glaring need for verification of process frameworks in real settings as well as the desirability of basing process frameworks on empirically derived models of cognition.

As noted, the one encouraging research effort in this area is Kuhlthau's series of investigations on the information search process. Using a number of methodologies (e.g., case studies, interviews, observations, content analysis), she developed a six-stage model of the research process—initiation, selection, exploration, formulation, collection, and presentation—and also identified thoughts and feelings that go along with each step.(15) The model holds up over time, with the perceptions of students previously studied matching the model even more closely after college.(16) The model has also been confirmed with high school students of high and middle abilities (1989), although further study is needed with students of low abilities.(17)

One other study attempted to investigate a process-oriented approach versus a traditional resource-based approach. Dewees (1987) tested two average level, fourth-grade classes on seven reference skill areas: table of contents, encyclopedia, card catalog, dictionary, table interpretation, index use, and map reading. The group that was taught using the "Pooh Step-by-Step Guide for Writing the Research Paper" was significantly higher on overall performance (and higher on each skill area tested) than the group taught library skills using a traditional method (i.e., instruction on individual research skills as separate entities). The findings of the Dewees study suggest that a process-oriented approach can be more effective than an approach that focuses on use of individual sources.(18)

These initial conclusions related to a process approach are encouraging. Kuhlthau's findings and related efforts in other areas of library and information science support a process approach to skills instruction. In addition, the outstanding paper by Mancall, Aaron, and Walker,(19) written for the National Commission on Library and Information Science, highlights research in critical thinking and metacognition that support a process approach.

Obviously, these efforts are just a beginning. Few of the studies explore the nature and scope of library and information processes, how information processes translate into teachable skills, the variation in processes due to group and individual differences, and the link between process and performance.

One crucial need highlighted in the first version of this paper was the need to bring together the various process models. Regarding the various library and information process models developed:

- What are the relationships (commonalities and differences) among them?
- Are they simply using different terms to describe the same thing, or are there substantive differences?

- Are they all empirically verifiable?
- Is there one linking “meta-process”?

Fortunately, there is some progress on answering these questions. At the AASL Preconference, “From information Skills to Information Literacy,” held in Atlanta on June 28, 1991, Eisenberg reported on his efforts to compare four well-publicized process models of library and information skills instruction: Kuhlthau, Eisenberg and Berkowitz, Irving, and Pitts and Stripling. After analyzing and summarizing each approach, Eisenberg found that a common process model did appear to emerge (see figure 1). While each author may explain the process with different terms, divide the various actions at different levels of specificity, and/or emphasize different phases of the process, all seem to agree on the overall scope and general breakdown of the process. That is, the most striking aspect of figure 1 is the overriding similarity among the models. It appears that the various process models are more alike than different, and it may be possible and desirable to begin speaking about a common process approach to library and information skills instruction. In terms of adoption at the local level, it may not make much difference which model forms the basis for the local curriculum. It also means that local schools and districts can combine desired aspects from the various models.

Figure 1. Comparison of Information Skills Process Models

Kuhlthau Info Seeking	Eisenberg/Berkowitz Info Problem-Solving	Irving Information Skills	Pitts/Stripling Research Process
1 Initiation	1 Task definition 1.1 Define the problem 1.2 Identify info requirem'ts	1 Formulation/analysis of information need	1 Choose a broad topic
2 Selection			2 Get an overview of the topic
			3 Narrow the topic
			4 Develop thesis/purpose statement
			5 Formulate questions to guide research
			6 Plan for research & production
3 Explor- ation [investig info on the general topic]	2 Info seeking strategies 2.1 Determine range sources 2.2 Prioritize sources	2 Identification/appraisal of likely sources	7 Find analyze evaluate sources
4 Formul- ation [of focus]	3 Location & access 3.1 Locate sources 3.2 Find info	3 Tracing/locating indiv resources	8 Evaluate evidence take notes/compile bib
5 Collect- ion [gather info on the focused topic]	4 Information use 4.1 Engage (read, view, etc.) 4.2 Extract info	4 Examining, selecting, & rejecting indiv resources	9 Establish conclusions/ Organize info in outline
	5 Synthesis 5.1 Organize 5.2 Present	5 Interrogating/using indiv resources	10 Create and present final product
		6 Recording/storing info	
6 Presentation		7 Interpretation, analysis, synthesis and eval. of info	
		8 Shape, presentation, and communication of info	
		9 Evaluation of the assignment	[Reflection point - is the paper/project satisfactory]
7 Assessment [of outcome/ process]	6 Evaluation 6.1 Judge the product 6.2 Judge the process		

When considered in conjunction with Kuhlthau's findings, this conclusion provides useful support for the process approach. Yes, there is certainly a great need for further study, but the importance placed on this theme in *Information Power* and throughout the field appears justified. Additional questions to address include the following:

- Are particular skills or steps associated with information processes more crucial than others?
- Are particular skills or steps particularly difficult or easy to develop in students?
- What relationships exist between library and information skills processes and other processes in education: critical thinking, the writing process, problem solving?
- How do the various models relate to learning models already established in other fields?
- What is the relationship between library and information skills, performance, and product?
- How are various process models affected by individual and group differences?
- In terms of practice, how widespread is a process approach to library and information skills? Are most library media programs source- or process-oriented? Are programs changing? What approach is most prevalent in scope-and-sequence documents?

Theme 3: The Integrated Approach

The phrase "integrated approach" refers to teaching library and information skills in the context of subject area curriculum and classroom instruction. This is a major theme in the current literature, in *Information Power*, and in various library media curriculum documents (e.g., New York's *Secondary Library Media and Information Skills Syllabus*, 1986; and Pennsylvania's *Integrating Information Management Skills: A Process for Incorporating Library Media Skills into Content Areas*, 1988; see also Barbara Minor's "Notes from ERIC" section in *SLMQ* 20:2, pp. 110–11).

Teaching library and information skills independent from subject area curricula is like teaching auto mechanics students how to use certain tools one at a time and then expecting them to be able to use the appropriate tool in a specific situation (e.g., fixing a car). The integrated approach would be, "Here's a car, and I'll show you how to fix it by using certain tools." An integrated approach moves the focus away from the tools and toward accomplishing the task at hand. "It is meaningless to teach locating, organizing, and synthesizing of information without practice. Practice involves using [information-management skills with] content or subject matter: the existing curriculum.(20)

Unfortunately, the theme of integration suffers from the same lack of substantiation as is found with the two previous themes. While the desirability of integrating skills instruction with subject area is widely accepted among library media professionals and educators, 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.

Some evidence in support of an integrated approach comes from research on bibliographic-instruction programs in academic libraries. Kohl and Wilson (1986) report that almost all studies about bibliographic instruction have been "limited to student self-reports of attitude change or to

measuring a student's theoretical understanding of how specific library tools should be used.(21) The more important question about bibliographic instruction and its relationship to students' effective use of information resources in actual course assignments is not well addressed by research. In a study by Kohl and Wilson at the University of Illinois at Urbana-Champaign, the authors compared a traditional tool-specific approach to a cognitive approach that focused on helping students develop a relevant research strategy that is individualized/customized/tailored to their specific research assignment. The cognitive approach (course integrated) for bibliographic instruction made a statistically significant positive difference in terms of the richness of student bibliographies (graded independently on three criteria by both a librarian and a writing instructor). The ratings of bibliographies relative to grades assigned to papers were not found significant, most likely due to the many other factors that influence grades. The Kohl and Wilson study is an important one. As the authors state, "Obviously further work needs to be done to see if additional research validates the findings presented here.(22)

Patrick's (1985) investigation into instructional involvement of library media programs in forty-nine schools in the Pulaski (Arkansas) County Special School District does show that interaction with school curriculum is possible in elementary and secondary school settings. Based on data gathered over a twelve-month period (October 1983-October 1984), Patrick concludes that "the quantity and quality of library media program instructional involvement can be increased with persistent effort [of the library media specialist] over a long period of time."13 After implementation of a systematic effort to increase library media specialist familiarity with school curriculum (through use of a "curriculum survey form"), it was found that "district-wide, library media program involvement in the curriculum at various levels showed a large increase over the preceding year.(24)

The finding that curriculum involvement is feasible is reinforced by the number of works written to assist practitioners in developing programs that integrate library media instruction and services with classroom content. Walker and Montgomery (1983),(25) Turner (1985),(26) Loertscher (1988),(27) Eisenberg and Berkowitz (1988),(28) and Krimmelbein (1989)(29) all offer well-thought-out approaches to ensuring that library media skills are curriculum based. Eisenberg (1984) has established that curriculum mapping is effective for gathering and evaluating information about curriculum.(30) While the various approaches appear logical and meet with success in practice as determined through local evaluation, there are no formal research studies assessing the effectiveness or impact of an integrated approach with elementary and secondary students.

Obviously, there is a need for more research on the integrated approach. Integration of library media skills instruction and services with subject area curriculum is seen as an essential component of effective library media programs. To ensure that this occurs, research is needed to establish criteria and methods for assessing degrees of integration, full understanding of the positive impact of integration, and essential actions to insure integration. The following sample research questions are:

- What is gained in terms of increased student information skills and subject area performance from an integrated approach versus out-of-context instruction?

- Does integrated library and information skills instruction foster the attainment of subject area curriculum objectives?
- How effective are the various methods of gathering and evaluating curriculum information (e.g., curriculum mapping)?
- What are the key variables for establishing an integrated program? Are certain variables common to existing models for integration (e.g., Loertscher, Turner, Eisenberg and Berkowitz, Krimmelbein)? Do successfully integrated programs share common elements?
- What are appropriate methods for assessing the degree of integration of a library and information skills instructional program?
- Is there an interaction between an integrated model and various approaches to skills curricula (e.g., process versus source approach)?

Theme 4: Alternative Methods of Teaching Library and Information Skills

Unlike the previous three themes, there is considerable research about the relative merit of various methods for teaching library media skills. Some studies report that it is not possible to draw conclusions due to problems with the research methodology (e.g., too many variables, too few subjects, intervening variables). In general, however, most research finds little evidence to support one instructional approach over another.

Iacovou (1987), for example, in comparing the use of worksheets with the use of computer-assisted instruction (CAI) for additional drill and practice of library skills, found no significant difference between the two methods.(31) In fact, actual student achievement appeared to be almost identical in both cases.

Zsiray (1983–84) also found little difference between a traditional method (lecture) and a computer-assisted approach (microcomputer-based courseware) for teaching a unit on the *Abridged Readers' Guide*.(32) The lecture and the microcomputer-based methods were found equally effective, although both were “statistically more effective than [an] independent reading approach” in terms of student performance. In addition to student performance, Zsiray analyzed efficient use of time.(33) Here there was a difference, with the microcomputer courseware taking only twenty-five minutes compared with a forty five-minute lecture.

Most studies comparing instructional methodologies find little evidence pointing to one method as superior to another. Hardesty (1984), for example, in a paper presented at the 1984 ALA conference, stated that “there may be fewer differences among the various teaching methods than we commonly believe.”(34) He also notes that “Ivor Davies, in his book *Competency Based Learning*, concluded after examining mountains of data and reviews of the literature that one key point stood out: There are no significant differences in terms of learning among the teaching methods available today.(35)

While questions about the performance and efficiency of various instructional methods are interesting, they do not appear to be as critical to the achievement of library and information

skills objectives as questions related to other themes. Also, since researchers concerned with instructional design and technology are likely to continue to explore alternative methodologies, researchers in library media should focus on the more pressing questions and issues noted above and monitor investigations into comparative methods by researchers in related educational fields.

Implications for Research

As noted at the outset of this paper, research investigations must confirm or refute conventional understandings. It is also important to be able to generalize beyond the settings of specific studies to the full range of library media instructional settings. This is accomplished through research design and replication of studies. Unfortunately, there are only a limited number of empirical research studies relevant to the four themes, and even fewer replications. The existing studies provide only initial verifications of some assumptions, and it is certainly not possible to justify widespread generalizing beyond the research settings.

Most major research questions related to library and information skills instruction, therefore, still remain. Of particular urgency are various issues related to the value of library and information skills instruction, the nature and scope of essential skills, and the relationship of skills instruction to classroom curriculum. Some specific concerns identified in this paper as priorities are:

- the influence of library and information skills instruction on subject area objectives, on college performance, and on lifelong learning;
- the impact of library and information skills instruction on the use of information in schools;
- relationships between the library and information skills process and other processes in education: critical thinking, writing, and problem solving;
- the relationship between the library and information skills process and student performance and products;
- the impact of integration of library and information skills and the subject area curriculum on attainment of objectives in both areas; and
- key elements in integrated skills instruction.

In writing this paper, the authors recognized another priority that is not always evident: the responsibilities of researchers to practitioners. It is important that researchers ultimately bridge the gap between research and practice. This requires going beyond statistics and data manipulation in reporting results. Researchers need to state directly and succinctly what the research does and does not show as well as the implications for day-to-day library media work. Finally, conclusions about the need for further research must go beyond cliches and point to specific requirements, questions, and approaches.

Implications for Practice

The four themes also have direct relevance for practicing library media specialists. Library and information skills instruction is important and should be an integral part of every library media program. Although more research needs to be done on the impact of skills instruction on student

performance, library media specialists can point to evidence that skills instruction has a positive impact on achievement.

In terms of the nature and scope of skills to be taught, there is general agreement that skills instruction should focus on process rather than sources. Practitioners can refer to models of information skills instruction noted above and others in the literature. All these works share the belief that specific library and information skills should be taught within the context of an overall process. Expanding on Eisenberg's initial effort to identify commonalities among the various process models as well as investigating the relationship between library and information skills processes to other processes in education (e.g., critical thinking, writing, problem solving) will greatly assist those in the field.

The "integrated approach" is also an important theme for library media practice. *Information Power*(36) and other writings promote the integration of library and information skills instruction with subject area curriculum as an essential component of effective library media programs. The limited research available to date does point to the value of the integrated approach, although more formal research studies assessing the full effectiveness and impact of an integrated approach are undoubtedly needed.

Finally, in terms of comparing alternative methods of teaching skills, most studies find little evidence that one method is superior to another. For practicing library media professionals, it appears that the concerns related to a process-oriented library and information skills curriculum and an integrated approach are more deserving of attention than various instructional strategies.

In conclusion, there is clearly a critical need for serious basic and applied research related to library and information skills instruction. This means tackling the big questions--not just the easy ones. One way of dealing with difficult issues is cooperation among researchers. Together it may be possible to determine research-able questions and suggest appropriate methods of inquiry. That is the purpose and promise of a number of current efforts in the school library media community (e.g., the AASL Research Grant program, the Treasure Mountain Research Retreats, and research forum presentations at the ALA Annual Conference).

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