Unleashing the Theory

Connecting Learning Theory to Building Information Seeking Skills

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This study surveyed 126 school librarians in eighteen countries, representing 131 schools serving more than 113,260 students. The survey instrument requested respondents to describe techniques they used to facilitate information literacy, their perceptions of their functions in the development of independent learners, and the training they received that enabled them to mediate information seeking and use skills. Survey data revealed that the respondents relate information skills instruction to students' interests, work with other teachers to place information seeking skills within the context of students' course work, and encourage students to share ideas and skills with each other as they build their own search strategies. Results indicate that the creation of independent, self-directed, lifelong learners is the goal of school librarians over the world. But data also reveal that most of the respondents spend less than a quarter of their time working with teachers to plan connected programs and that many school libraries are understaffed.

Introduction

A function of library service is information skills training, also referred to as library user education, library orientation, bibliographic instruction and, most recently, the development of information literacy (Evans, Amodeo, and Carter, 1992). In the past the term "bibliographic instruction" was used to describe a process that focused almost exclusively on identifying and introducing resources organized within the library's walls. Today, through electronic information services, information professionals are able to provide access to information wherever it resides.

If a major facet of library service is to teach individuals to use information resources, why are potential users not using the resources? Faculty and librarians at universities and colleges note that, after twelve years of instruction in the schools and opportunity for exposure to the services of public libraries, incoming freshmen have not internalized prior information skills training and continue to resist bibliographic instruction (Mellon, 1987). Research suggests that group lectures focusing on specific locational skills isolated from personal context do not result in students' learning and applying information skills. Students also learn little from demonstrations when they are given no opportunity to practice what they have seen (Havighurst, 1952; Pitts, 1994).

Recognizing that effective instruction incorporates opportunity to practice and apply what is learned, leaders in information studies urge examination and application of the findings of cognitive science and constructivism in all kinds of libraries (Kuhlthau, 1993; McNeer, 1991; Nahl-Jakobovits & Jakobovits, 1990; Shirato, 1991). The teaching of library skills now includes the teaching of information skills with an emphasis on learning to solve information problems. Similarly, information professionals are now encouraged to talk about theory as it informs this process (Carey, 1998). Librarians, especially those working with children and adolescents, are becoming more effective as they learn more about how people learn and allow their knowledge of learning theory to shape their information skills training. As Kuhlthau states, "Experience solidly grounded in an understanding of [learning] theory is the basis for making diagnoses and designing services that respond to dynamic needs of clients," (1993, p. xviii).

From the early twentieth century empirical behaviorism dominated the practice of the educational establishment (Barsalou, 1992), but findings in linguistics, information theory, and computer science combined with developmental psychology after World War II to create the field of cognitive psychology. Cognitive psychology offers a way to study the invisible constructs of the human mind and presents a view of learning that provides an alternative to studying only behavior that can be observed (Barsalou, 1992; Resnick, 1987).

Educational constructivism yields some insights for librarians. It originated in Piaget's theories of the development of knowledge and the social-interaction theories of Lev Vygotsky and Jerome Bruner sees knowledge not as a single reality to be grasped by the learners. In constructivist theory, the concept of truth is replaced by workability, and reality becomes a personal interpretation of the world that changes through social interaction (Wheatley, 1991). Education is focused on the individual becoming a self-directed problem solver. Problem solving requires finding, interpreting, and using information (Tuckett &

Stoffle, 1984) and utilizing higher order thinking skills. As Aaron points out, "active learning goes hand-in-hand with critical thinking and effective problem solving" (1990, p. 40), substantiating the call for active involvement of the learner as he or she forms, tests, and revises mental models until a useful one emerges (Bruner, 1986; Dewey, 1933; Pitts, 1994). Librarians who provide information skills training and assistance to library users are clearly helping the users to think critically and solve problems while learning to meet informational needs.

Information seeking is a problem solving activity that has changed with technological advances. The advent of telecommunications has made available vast amounts of information of varying levels of accuracy. In addition to finding it, the information seeker must evaluate the pertinancy and relevancy to his or her personal store of knowledge. If we are to look on this task as a constructivist who sees that the application of what is learned is central to learning (Perkins, 1991), we recognize that the process of finding the information cannot be divorced from the process of using it. Librarians, therefore, are bound to facilitate understanding as well as physical access to information. In other words, the goal is to assist library users to attain "information power" by facilitating their development into independent, self-directed learners.

Information Power: Building Partnerships for Learning, the 1998 guidelines for school library media specialists/school librarians, speaks to the activities of the information professional in mediating the student's construction of knowledge. This document recommends that school librarians help students become self-directed learners by implementing three constructivist learning techniques:

1. Promote relationships with information sources in the contexts of learning experiences.
2. Model the attitudes and skills of the independent information seeker.
3. Collaborate with teachers, students and others in the learning community to develop efficient strategies of inquiry for responsible decision making.

With these principles in mind the investigators constructed a study to examine how school library media specialists/school librarians currently guide students to the attainment of information literacy. The purpose of this study is to identify certain characteristics of school information service programming in the United States and in other countries and to compare them, identifying training levels for and common practices employed in offering information skills instruction programs. The study reveals school librarians' awareness of and their utilization of current research to inform their instruction toward information literacy. It is hoped that this study will contribute to our understanding of how school library media specialists can apply research theories and models to library and information skills instruction, thereby closing the gap between theory and practice and improving our instruction toward information literacy for our students.

Research Methodology

Research questions

This study addresses four questions:

1. What techniques do school library media specialists/school librarians use to facilitate information literacy?
2. What is the perceived function of school library media specialists/school librarians in the development of independent, self-directed learners?
3. What training do school library media specialists/school librarians receive to enable them to mediate information seeking and use skills?
4. What are international trends in provision of information seeking and use skills?

Respondents

The basis of this study is the reports of 126 library media specialists/school librarians who are members of the American Association of School Librarians and/or the International Association of School Librarianship, a 19% response rate for the survey. The respondents represent eighteen nations and 131 schools serving 113,260 students. The investigators sent a total of 645 questionnaires to 370 randomly selected members of AASL and 275 of IASL. Of the respondents, 87 reported membership in AASL, 39 in IASL. and 16 in both organizations. Ninety-six respondents claimed membership in two or more professional organizations, and fifty (40%) in three or more. Six respondents also noted membership in various education associations. In total, the 126 respondents belong to a total of 97 separate professional and/or educational organizations.

Since the IASL and AASL membership lists do not indicate whether individuals currently manage school libraries, the investigators enclosed a letter requesting that a recipient who was not now in a school library facility pass along the questionnaire to one who was. Eleven retired librarians used the return envelopes to wish us luck with our project.

Questionnaire

The four page questionnaire that investigators sent to potential respondents was divided into three areas: general questions concerning the facilities, questions concerning participants' educational backgrounds and exposure to learning theories, and questions concerning techniques they used in their information skills programs. The last ten questions were open-ended, inviting school librarians to describe the techniques they used to facilitate information literacy. Five media specialists in the United States and five school librarians in St. Lucia tested the questionnaire.

Results

Research question 1. What techniques do school library media specialists/school librarians use to facilitate information literacy?

The strategies school librarians used for helping students find information fell into three general areas. Librarians communicated with teachers in order to make the information seeking tools relevant to students' immediate interests, that is, their course work. They modeled efficient actions and enthusiasm as they guided students through their information gathering experiences. They gave students opportunities to practice skills related to information quests, they asked students questions to help students articulate information needs, they provided environments that invited students to communicate with each other while brain storming and making predictions, and they encouraged students to write throughout the search process. The major difference between helping students find information for course assignments and for personal use was the involvement of other teachers in the former and the use of general booktalks, reading lists, and author visits in the latter.

Librarians reported that they used group-constructed checklists and rubrics to check sources (print, electronic, and interpersonal) against certain evaluation criteria: accuracy, reliability, authority, pertinency, relevancy, and currency. Here was an activity in which the differences between fact and opinion and between primary and secondary sources could be emphasized. One respondent indicated that students across the school were expected to cite sources in APA style. This way, the students not only learned the importance of citing sources in a consistent style and learned the style at the same time, but they also became aware of the issues of currency and authority. Respondents reported that they used educational web sites that provided evaluation activities for other web sites and that their students examined URLs to identify the authority of sponsoring entities.

Strategies for helping students complete the search process by making use of information resulted in some visible product of the search such as traditional written reports and static displays, multimedia slide shows, student bibliographies, and student-constructed web pages. One librarian reported that her students designed money market portfolios based on stock market research.

Respondents reported that they used oral discussion, journals, or learning logs to offer students opportunities for reflection throughout the research process. One who addressed the presence of prediction and evaluation in the reflection phase of the information seeking process wrote, "[I] ask a series of questions which helps them evaluate their level of success in locating what they need, to refocus if necessary, and to consider what results a different approach would yield. This is a good opportunity to help a student recognize that the Internet is not the answer to all information needs." Seven respondents noted that this reflection phase was either missing or minimal in their activities. Five said they did not do enough, one said she had never emphasized reflection but planned to, and one reported that she considered it to be something teachers, rather than librarians, did.

The question that most respondents chose not to answer was "How do you help students recognize the importance of information to a civil society?" Some who did answer this

question said that they encouraged students to compare news stories on television, radio, the newspaper, and the World Wide Web. Others indicated that they helped their students relate their findings to what was happening in their communities. Three respondents indicated that they were diligent about providing free, or at least "reasonable," access to a broad range of information through their libraries. Two people activities in which students investigated access to information in other time periods—one was the Middle Ages, the other was Ancient Egypt.

Respondents referred to the Internet Acceptable Use Policies established in their facilities as a major method for promoting ethical behavior in the information search process. Guarding against plagiarism and complying with the copyright laws were addressed through the requirement that all sources be shown. Respondents reported that learning to take clear paraphrased notes contributed to behaving ethically in the research process. The use of one style manual, district or school-wide, throughout the grades, was indicated as a method for standardizing the showing of sources leading to a situation in which source citation would be observed by students as a natural and integral part of the process. One librarian pointed out that she was scrupulous about modeling ethical behaviors in information gathering. She extended that behavior to helping teachers to follow suit. "[I] encourage teachers to do the same and support them with appropriate resources so they are not tempted to violate their intellectual property rights or others' in front of their students."

Respondents reported that they encouraged collaboration in the pursuit and generation of information through providing opportunities for group and cooperative learning situations. They also emphasized the importance of linking search strategies to course requirements through collaboration between librarians and other teachers. Strategies to achieve this collaboration included seeking input, notifying of new materials, and attending curriculum meetings. However, one librarian noted that she did not encourage group work, ". . .as the group work usually lands on one member." She said she generally limited group work to brain storming. One librarian indicated that she sent a weekly email newsletter to other teachers and that she requested that they team to write grant proposals. Another mentioned that she sought the expertise of individuals beyond the school community.

Research Question 2. What is the self-perceived function of school library media specialists/school librarians in the development of independent, self-directed learners?

Respondents in the survey described the "ideal" graduate of their information skills instructional programming as an independent learner who could recognize a need, then access, evaluate, communicate, and create information from print, electronic, and interpersonal sources, and determine the most appropriate source for the needed information. The ideal graduate would read for personal pleasure—one respondent added that her ideal graduate would be a public library user. In addition, the confident and independent information seeker possesses the important characteristics of flexibility and resourcefulness.

Respondents wrote that knowledge, skills and attitudes (including enthusiasm and ethical behavior) combined to contribute to the evolution of the independent, self-directed,

confident, and questioning lifelong learner, and the librarians who responded viewed themselves as facilitators in the information seeking process.

Reactions to their school library varied among the respondents. Those who reported that their libraries received strong official support also noted that students responded enthusiastically to their programs and excelled in later pursuits. Those who reported that their facilities were understaffed noted that there was no time for collaboration with other teachers to integrate information searching skills with coursework and that students reactions were "lukewarm." One librarian related that, in her village, education was not given high priority and students were not receptive to her program. Another observed, "Staff need to believe in the program and give status and prestige to the need for the skills."

Respondents reported that they could see dramatically positive responses when the skills learned were directly related to assignments in other classes. One said that at first students indicated that they did not think they needed information skills training, that they already knew how to find and use information. But as they progressed in her program they delighted in their new found skills and wanted to share their new knowledge and skills with others. One wrote that students reacted enthusiastically when projects interested them or when the skills enabled them to do something new but that they reacted "with arrogance" when asked to plan Internet searches in order to save time. "They seem unable to believe that someone over 30 knows anything about computers. . ."

Respondents noticed attitudes reflected age level. A primary school librarian in a Caribbean country with competitive external exams related that children in grades 1 through 4 were excited about learning information skills. When they began concentrating on exams in grades 5 and 6, the children seemed to lose their enthusiasm. This respondent observed that, "Teachers also seem to motivate them less and feel that [information seeking] projects are a waste of time instead of enhancing lessons." A librarian in one high school in the United States observed that children in grades 8 and 9 were enthusiastic information gatherers but that in grades 10 through 12 motivation appeared to decline. On the other hand, a librarian in another school indicated that she thought that by the time students reached there second to last year in high school, they appreciated that their information skills training was preparing them for success beyond high school.

Research Question 3. What training do school library media specialists/school librarians receive to enable them to mediate information seeking and use skills?

Of the respondents, 110 (88%) indicated that they were certified/trained librarians—77 had a master's degree in the field; and seven reported that they were currently working on certification. The respondents' qualifications as teachers were as follows: 104 (83%) indicated that they were certified/trained as teachers, and one reported working toward that goal; 44 had a master's degree in education; and five held doctoral degrees. Opportunities for continuing education more than once a year were available to 86 respondents; 22 reported they had annual opportunities. Ninety-three (74%) noted that they had read research related to learning theories during the last year.

When asked to identify educational theorists known to them from a list provided by the investigators (John Dewey, Jean Piaget, Carol Kuhlthau, B. F. Skinner, Jerome Bruner,

Nicholas Belkin, Lev Vygotsky, Robert M. Gagne, R. S. Taylor), Dewey (113), Piaget (115) and Skinner (108) topped the list. Information theorists Kuhlthau (51),Taylor (15), and Belkin (11) were less familiar, and constructivist Lev Vygotsky was recognized by only 19 respondents. Respondents were then requested to list any educational theorists who had informed the development of their information skills programs. Of the names provided by the investigators, respondents credited Carol Kuhlthau (18), Jean Piaget (14), John Dewey (9), B. F. Skinner (5), Jerome Bruner (5), and Lev Vygotsky (3) with influencing their programs. These results indicate that school librarians in this study looked to the fields of education, information studies, and beyond to assist them in their practice as mediators of information seeking and use skills (see chart below).

Influences on the Development of Information Skills Programs

Adler, Mortimer	Freeman, Judy	Katz, Lillian	Sizer, Theodore
Belkin, Nicholas J.	Gardner, Howard	Krashen, Stephen	Skinner, B. F.
Berkowitz, Robert E.	Gawith, Gwen	Kuhlthau, Carol	Smallwood, Carol
Bloom, Benjamin	Gilligan. Carol	Loertscher, David	Solomon, Gwen
Brake, Terrance	Goodlad, John	Lundin, Roy	Stripling, Barbara
Breivak, Patricia	Hay, Lynn	Maslow, Abraham	Sylvester, Robert
Bruner, Jerome	Haycock, Carol A.	McKenzie, Jamie	Tallman, Julie
Callison, Daniel	Haycock, Ken	McLuhan,	Tepe, Ann
Carroll, John	Helm, Judy Harris	Marshall	Todd, Ross
Chiro, Dede	Henri, James	McTighe, Jay	Trelease, Jim
Chomsky, Noam	Jacobs, Heidi Hayes	Meek, Anne	Vygotsky, Lev
DeBono, Edward	Hunter, Madeline	Montessori, Maria	Wiggins, Grant
Dede, Chris	Illich, Ivan	Pappas, Marjorie	Wolfe, Pat
Dewey, John	Irving, Ann	Piaget, Jean	Yucht, Alice H
Dignazio, Fred	Johnson, David W.	Pipher, Mary	
Eisenberg, Michael B.	Johnson, Roger T.	Pitts, Judy M.	
Eisner, Elliot	Joyce, Marilyn	Pollack, William	
		Shrock, Kathy	

There were 99 references to the use of written standards/guidelines to assist school librarians with their information skills programs. These included *Information Power: Building Partnerships for Learning* (44), *Learning for the Future: Developing Information Services in Australian Schools* (8), IASL documents (2), state or provincial standards (21), district or school standards (16), Eisenberg and Berkowitz's "Big 6" skills curriculum (9), and general professional reading (6).

Research Question 4. What are international trends in provision of information seeking and use skills?

Although response rates were disappointing and prevent use for meaningful statistical analysis, 144 individuals representing 20 nations responded. Among the respondents, 126 from 18 counties contributed information about their libraries, their users, their training and the information skills programming they provided. Within the United States, responses came from 34 states. Descriptive analysis of these results identifies some similarities and a number of differences between the respondents in the U.S. and those from outside the U.S.

Terminology was one of the most notable differences: only 34% of respondents called themselves "librarians", another 12% were "teacher-librarians," the rest were "media specialists" or "information resource coordinators." It is interesting to note that teacher-librarian is a non-U.S. appellation, used by 48% of all of the non-U.S. respondents. Approximately half (51%) of the U.S. respondents and 34% of all those who replied estimated that they spent at least 50% of their time involved in direct teaching activities.

Respondents commonly reported understaffed facilities: 55% of U.S. respondents and 25% of the other respondents said they worked in one-person libraries with no additional support. Five percent of U.S. respondents and 18% of non-U.S. respondents were not trained as librarians. The same percentages of respondents indicated that they had infrequent opportunities for pursuing continuing education programs. Most of U.S. respondents (95%) reported purchasing materials for collections, as did most non-U.S. respondents (91%) reported purchasing materials for collections, and 85% of U.S. and 88% of non-U.S. respondents said their libraries or centers provided access to digital materials. OPACs were present in 85% of U.S. libraries in the study and 75% of non-U.S. libraries, 10% of U.S. respondents with OPACs provided only mediated searching due to shortage of equipment. All non-U.S. respondents with OPACs were able to allow direct student searching. Internet access in the school library was reported by 97% of U.S. respondents and 94% of non-U.S. respondents. In 8% of the U.S. and 19% of the non-U.S. respondents' libraries, equipment constraints meant that Internet access was mediated.

Responses to the survey showed that the creation of independent, self-directed, lifelong learners was the goal of both groups for both groups of respondents: 45% of the U.S. group and 35% of the non-U.S. respondents reported that they spent more than 50% of their time teaching. But over 81% of the U.S. and 84% of the non-U.S. respondents spent less than 25% of their time working with teachers to plan programs that linked skill development to their learning tasks.

Forty-four school librarians from the United States, Australia (two of eleven respondents), Canada (one of four respondents), and Finland (one), referred *to Information Power: Building Partnerships for Learning* as the guidelines that informed their practice. Eight of the eleven respondents from Australia referred to own their national standards and guidelines document, *Learning for the Future: Developing Information Services in Australian Schools*. One of the Australian respondents and the librarian in Jamaica indicated that they used guidelines provided by IASL. Twenty-seven of the U.S. respondents and one of the Canadian respondents referred to state, school or other regional standards and guidelines as did seven from Australia, one from New Guinea, and one from Jamaica. Seven U.S. librarians, one from Belgium, and one from Australia identified The "Big 6" as guidelines they used. Three from the U.S., one of the Australian respondents, the librarian from Jamaica, and a librarian from Iran indicated that their professional reading provided them with guidelines.

Conclusions

Worldwide, school librarians see themselves as facilitators and learners with the constructivist's perspective of learning. As facilitators, they provide safe environments for sharing ideas, coaching students by questioning, prompting and encouraging students to become independent information seekers. They assess learning while it is happening. Respondents indicated that they relied most heavily on observation, checklists and rubrics, and conferences as assessment tools--measures that can be applied throughout the learning and that invite student input in construction. Responses indicated that librarians strive to aid students to become efficient decision makers. Comments participants made indicated that their students usually appreciated the assistance of their school librarians. As learners themselves, school librarians read eclectically in the literature of information studies, general education, and information skills education. One librarian referred to Marshall McLuhan as someone who had informed the information skills program. School librarians use written standards and guidelines to evaluate their programs. They apply what they read to their programs, which they continually revise and refine.

The responses indicated that school librarians believe that strong school libraries require adequate staff support and up-to-date equipment. One librarian identified ingredients for a successful information skills program, writing that "We enjoy very high usage of our centre, both with formal classes and informal use from 7:30 a.m. to 5:00 p.m., due to a compilation of factors: instruction in the research process; collaboration with teachers who are very resource based; large relevant collection; good access to technologies."

Surprisingly, only 82 participants (65% of the sample) indicated that more than 50% of their information skills instructional programming related to course content taught by other teachers. Even more surprising is the high number (104) of participants who said they spent less than 25% of their time conferring with other teachers. Information skills research has shown that teaching information skills in the context of students' lives is key to their becoming information literate (Information Power, 1998). School librarians are urged in their coursework and their professional reading to connect to the other teachers through formal and informal conferences, marketing their resource centers, requesting input from other teachers, serving on education committees. Enlightening colleagues is not an easy task, as evidenced by comments made by respondents. One librarian characterized connecting information skills to other courses in her school as "an uphill battle." Another respondent's remarks summed up the consensus expressed in nearly all the responses: "Students who have gone through a structured program because their teachers are my partners have written in their learning logs that they have increased self-confidence and have a process for solving problems that they can apply to new situations. The trouble is convincing the more content-driven teachers that they need to integrate information literacy skills into their curriculum." The findings of this study suggest that in schools in which all teachers view themselves as learners, facilitators, and team members in the way school librarians do, the students progress smoothly and naturally toward becoming lifelong learners

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