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Toward Information Literacy—Innovative Perspectives for the 1990s

Mary M. Huston
Issue Editor

University of Illinois
Graduate School of Library and Information Science
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Innovative Perspectives for
the 1990s

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Introduction

MARY M. HUSTON

In the past decade, librarians have come to agree that mere library orientation offers prospective researchers inadequate preparation for the decision-making involved in contemporary information-gathering and utilization activities. More recently, many professionals have recognized the merits of conceptual approaches to instruction which—unlike procedural instruction—are transferable to a variety of information-handling situations. This development has been linked with the recognition that enabling conceptual instruction must be contextual. For instance, it should acknowledge researchers' experiential context, it should establish the scholarly context of academic inquiry, and it should recognize the increasingly technological environment in which information is generated and retrieved.

Most recently, the profession's attention has turned to the contemporary need for intelligent decision-making which is, in turn, dependent on individuals' access to and use of accurate, comprehensive, and relevant information. An information literate person, then, must be able to recognize when information is needed and have the ability to effectively locate, evaluate, and employ the needed information. As succinctly stated in the final report of the American Library Association Presidential Committee on Information Literacy: “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” (Breivik,
The contributors to this issue of *Library Trends* have accepted the challenge of presenting instructional perspectives, from varying points of view, which support the cultivation of dimensions of information literacy.

All too often in the past, librarians have understood "research" to be synonymous with "knowing how to use the library"—and their bibliographic instruction programs have reflected this reductionist assumption. These authors, however, understand "research" to be a dynamic interconnected process of information retrieval and knowledge generation. For instance, they visualize scholarly discourse as the making of meaning through well elaborated information-gathering and knowledge presentation processes (Stoan, McInnis, and Symes). They are conversant with enhanced access opportunities through emerging information technologies and eager to realize these potentialities through actively engaging users in intellectual discovery (Oberman).

The perspectives expressed in this proposal also give new meaning to the terms *client-centered* or *user-based* instruction, acknowledging novices' deep understanding of nonbibliographic information systems (Fielder and Huston), which is transferable to cultivating researchers' thinking bibliographically like formally trained searchers (Rubens). Authors recognize that enabling researchers to make concept-based connections with appropriate ideas and tools both in the classroom (Huston, Baker, and Pastine) and at the reference desk (Hensley) requires the application of sound learning principles. Satisfying users' pluralistic needs also requires establishing hospitable relationships with diverse user populations (Hall and Miericke) so as to successfully cultivate users' "cognitive authority" (Wilson) in information handling. Nontraditional library structures (Pedersen, Espinola, Huston, and Motley), user-centered retrieval systems (Gorman), and revised library school curricula (Huston, Baker, and Pastine) can support the large-scale changes necessary to promote both libraries and literacy.

These authors' perspectives offer ambitious, innovative ideas which challenge the currently accepted notions about the appropriate scope and outcome of user education. It is fitting that these visionary thoughts are published at the beginning of a decade which promises to give new meaning to the phrase "information age." In turn, it is the editor's hope that this issue of *Library Trends* will give new meaning to the phrase "information literacy."

**Reference**

Avoiding the Cereal Syndrome, or Critical Thinking in the Electronic Environment

Cerise Oberman

ABSTRACT

Advances in technology have allowed the "supercatalog" to move from an idea to a reality. With its multiple databases and integrated structures, the supercatalog offers access to more information more easily than ever before. For all the advantages that this new technology offers, there are also problems that must be recognized and confronted. The most serious of these is that users must choose from a multitude of possibilities in order to fulfill their information needs. Research about consumer tolerance for making choices, whether about cereals or databases, suggests that "more is less," not "more is more." Thus, it is imperative that librarians adequately prepare users with the critical thinking skills that are necessary to take advantage fully of the new electronic environment. More than ever, critical thinking must become the core of bibliographic instruction.

When George Orwell (1949) penned his now famous phrase "Freedom is Slavery," he was not thinking about the emergence of a sophisticated integrated information retrieval system. Yet, his dystopian vision of a world where choice results in individual confusion and anxiety presages at least one of the critical issues emerging from our increased abilities to provide access to a wide range of information easily and transparently—i.e., making choices.

This problem is not limited to online information systems. Indeed, it is becoming a growing area of concern in our everyday lives. Perhaps an illuminating, if mundane, example of this problem...
is evident in the extraordinary increase of items available in the supermarket. Not surprisingly, the overwhelming availability of competing items to choose from in the supermarket, according to one study, results in increased anxiety among shoppers (Williams, 1990). This was borne out recently by a story a friend relayed to me. He had gone to the grocery store to pick up his favorite cereal. The endless aisles of different types of cereals so overwhelmed and frustrated him—he could not find his favorite brand—that he abandoned his cart mid-aisle and went to a small corner grocery that had far fewer choices. He was a victim of the "cereal syndrome." Much to the dismay of hypermarkets everywhere, all indications seem to support the conclusion of David A. Gosline, president of the American Institute for Research, that: "Choices do not make life easier; they make it more difficult for all of us" (Williams, 1990, p. Cl).

The problems of choice facing consumers in the grocery store are not that different from the problems of increasing choice which face students and faculty in the emerging online library environment. Libraries, armed with the latest technological breakthroughs, have begun to reshape access patterns to information. The one pattern which has become the sine qua non of libraries is the building of the "Supercatalog." The supercatalog, according to Shaw (1988): (1) is distant-independent, (2) contains multiple collections residing on one computer (or accessible via a network), and (3) has access points only limited by content of record. The idea of the supercatalog is attractive: a single access point, available from any microcomputer, which can provide the user with information about local library holdings, and electronic gateways to other library holdings, periodical abstracts and indexes, national bibliographic utilities, encyclopedias, etc.

This online library, well advanced beyond the online catalog, opens opportunities for the user unimagined as recently as twenty-five years ago. Shaw (1988) asserts that this new catalog offers "nothing short of improving the quality of both learning and research." But he hastens to add that "we do not yet understand either learning or research well enough to know much about how to approach the task" (p. 143). Clearly this new supercatalog presents a number of interesting and challenging problems, not the least of which is the overwhelming number of choices presented to the user. Users may soon be confronting the library equivalent to the "cereal syndrome." More important, perhaps, is the question that the situation provokes: How do we ensure that students are equipped to harness the extraordinary powers of this new online environment? The answer to this question lies in bibliographic education.
The emergence of the supercatalog is one of the most important consequences of computer and telecommunication technologies. Schill (1987) was correct when he suggested that the wiring of the university is "the most significant area for library administrators and instruction librarians to monitor" (p. 443). The wiring of the university and the concomitant emergence of new information structures are indeed two of the most influential environmental elements influencing higher education. Furthermore, their impact on instruction librarians and the design of instruction has been, and will continue to be, acute.

The online public access catalog, the first major component in the new online library, spurred much discussion and experimentation in teaching methods and formats. What was instantly apparent was that, "the mere presence of an online catalog often create[d] a false sense of confidence concerning the comprehension of its content and the knowledge required to use it effectively" (Baker, 1986, p. 36). Borne out by a number of other studies, the online catalog was viewed as a panacea by users, regardless of their success in locating relevant materials. The lure of technology had made itself felt. The conclusion of a study of user information-seeking behavior at Bowling Green State University, for instance, indicates that "automation (i.e., online public access catalog, OCLC, optical disks) attracts—and it attracts even the user who has infrequently used library reference sources" (York, 1988, p. 16).

Perceived user happiness, though a desirable by-product, is not acceptable from an instruction librarian's perspective (nor should it be acceptable to researchers). Users must understand the online environment. Specifically, as Baker (1986) asserts, the user must be able to: (1) understand the function and purpose of the online catalog; (2) define the scope of the catalog; (3) understand selected concepts of an online information retrieval system; (4) structure an online catalog search by choosing, entering, and manipulating search vocabulary; and (5) interpret the results of a search and identify information from it that is pertinent to the user's information needs. By adopting the database itself as the conceptual model for teaching online retrieval, Baker and Sandore (1988) have concentrated on identifying and teaching concepts which are unique to the online environment (e.g., Boolean searching, command structure, controlled vocabulary versus free-text searching, command language). The articulation of concepts unique to the electronic library underscores the additional skills which students must possess to operate successfully in this new environment.

A number of studies at academic libraries illustrate the dismal abilities of students, at the most basic level, of being able to match
their subject needs with appropriate computer retrieval systems. At the Undergraduate Library of the University of Illinois at Urbana-Champaign for instance, eighty-two searches conducted on CD-ROM databases were reviewed and analyzed by three judges for suitability and appropriateness of database in relation to the subject content. Users had a selection of sixteen CD-ROM databases to choose from; only 22 percent of the searchers selected databases deemed appropriate for their search topic. Almost 20 percent of the users selected databases considered to be not even one of the three most suitable databases (Allen, 1990). At the University of North Carolina's Undergraduate Library a series of interviews with InfoTrac users revealed that 9 percent of those interviewed were trying to use InfoTrac for researching such topics as Graham Greene, Spanish American War, and Kierkegaard (Momenee, 1987).

In other words, if these studies are typical of other user groups, the most basic critical thinking skills required for matching subject relevance with appropriate sources of information are sorely missing in the vast majority of undergraduates. These are not revolutionary findings. Quite the contrary. The same statistics would no doubt be duplicated in an examination or selection of print indexes/abstracts. What is significant, however, is that unlike print reference tools, which for the most part remain singular in form and format, the online environment is hurtling toward a totally integrated information network in the form of a supercatalog. This integration, which promises transparency of access to millions of information bits, has several possible outcomes: (1) it will be embraced warmly and enthusiastically for bringing the information to the user, not the user to the information. More than likely, this reaction will be from knowledgeable informed users who can easily distinguish which, among many information retrieval options, are appropriate; (2) it will be embraced enthusiastically from a misguided perception that all information is dispensed through the supercatalog (a misperception already evidenced in studies of online public catalogs and InfoTrac); and (3) it will be a replication of the "cereal syndrome" which results in increased anxiety and avoidance.

It is interesting to note that in Huston and Oberman's (1989) study of information-seeking novices, there is a marked contrast between their affective behavior in searching for information outside the database environment and in the database environment itself. When gathering information to support a project outside the online environment, students represented their efforts as "alive" and "happening." This is attributed to the "living, human nature of the information providers who were functioning, as 'interfaces' between the bodies of knowledge and the requestors of information"
(p. 205). When the same students were asked to use manual and online methods to gather information, their mental state was significantly changed and they expressed either qualified success or dissatisfaction. These findings seem to support Mellon's (1986) qualitative study of students' reactions to library use. Through an extensive sampling of students' experiences in using the library, Mellon concluded that "when confronted with the need to gather information in the library for their first research paper, many students become so anxious that they are unable to approach the problem logically or effectively" (p. 163). The addition of electronic access may indeed serve to magnify students' anxieties.

The most extensive examination of students' affective behavior in conducting library-based research was done with elementary and secondary school students. In a series of longitudinal studies over a five-year period, Carol Kuhlthau (1987) plotted the library research process of these students. Her research revealed six stages which these students progressed through in their process of gathering information:

1. task initiation characterized by feelings of uncertainty and apprehension;
2. topic selection characterized by optimism;
3. prefocus formulation characterized by confusion and frustration and strong doubts about individual ability to complete the task;
4. focus formulation characterized by the emergence of a central theme;
5. information collection characterized by a sense of direction and increased confidence;
6. search closure characterized by relief, satisfaction, and accomplishment.

Kuhlthau's (1988) research process model offers some interesting insights into student emotional behavior when pursuing the unknown. The third and fifth stages of the model in particular—prefocus exploration and information collection—offer a unique insight into the problems of choice and selection. It is in these two stages of the search process that students confront a series of choices; their reactions are telling. In the prefocus exploration stage, students seek a focus for their topics. According to Kuhlthau, their feelings are characterized by "confusion, doubt, sometimes threat, uncertainty" (p. 238). Yet the actions and strategies identified to overcome their feelings include finding and reading additional information, identifying relevant descriptors, and taking notes.

In the initial information collection stage, students must locate materials which support their focused topics. Their feelings are characterized by "realization of extensive work to be done, confidence
in ability to complete the task, and increased interest” (p. 240). Their actions and strategies directly involve using the library for conducting a successful search for materials, using a variety of reference tools, and seeking assistance from a reference librarian.

What is of particular interest is that students in the Kuhlthau study exhibit an increased sense of confidence once they have completed the focus stage of their research—that is, once they have completed making their choices. The information collection stage, marked by confidence and increased interest on the part of the students, may, at best, be illusory. Kuhlthau is not studying the quality of the student products, rather their affective and cognitive processes. But if the studies cited earlier are general indicators of student inabilities to understand the online environment—its complexities and its dimensions—then perhaps, in that domain too, their ignorance will be fueled by a naive confidence.

The significance of Kuhlthau’s work is that it provides a road map of student thinking at each stage of the research process. Additionally, it provides a potential yardstick by which students can gauge their state of mind and recognize that as each stage is completed a growing sense of confidence and accomplishment will emerge. Among other things, Kuhlthau’s study suggests that the process of research is often filled with ambiguities and uncertainties. Finally, she proposes that once students understand that research is not a linear process, they can proceed with reassurance and security. By understanding the process, students will be better prepared to be successful.

This affective study, limited as it is to elementary and secondary students, is precisely the type of study which needs to be conducted for the electronic information environment.1 Investigation, particularly during the information collection stage, might yield some important insights into whether the networked environment is the seductive creature it is currently perceived as, or whether, as the networked environment becomes more intricate and interwoven, students will recognize its complexities and feel overwhelmed rather than comforted by it.

It is too presumptuous to assume that we are creating an online library environment which will result in a higher level of anxiety and confusion for users. This is borne out by a recent study of user persistence in scanning references. Wiberley and Daugherty (1988) conclude that, “maximizing retrieval...can lead to [information] excess” (p. 154). Information excess can lead to intellectual distress. It was found that end-users preferred to receive limited search results
(between thirty and seventy citations). It was also found that end-users would commonly abandon the search for information entirely if provided with more references than they were willing to scan.

Even skeptics about the impact of information overload recognize its potential problems. Rudd and Rudd (1986), for instance, assert that the issue of information overload is much overrated and there is little empirical evidence to suggest that increased amounts of information have an effect on the quality of the decision-making process. However, they do take time to suggest a four point model to prevent users from possible information overload: limiting information by type, date, etc.; minimizing time users spend in locating desired materials; developing and refining users' skills through instructional programs; and, finally, selecting and evaluating information.

These skills demand significant critical thinking skills on the part of the user. And indeed, it is these new skills which are the heart and soul of the conceptual movement of bibliographic instruction. They have been embraced by an ever increasing number of practitioners and, most recently, have been codified by the Association of College & Research Libraries (ACRL) Bibliographic Instruction Section (BIS) in their *Statement of Model Objectives for Academic Bibliographic Instruction* (1987). The ACRL BIS "Statement of Model Objectives" is not specifically written for the electronic environment. The statement is, however, intended to cover all concepts which are essential for students to understand and to handle effectively the ever growing system of information opportunities, including the electronic environment.

Recognition of the importance of concepts to bibliographic instruction has been a rite of passage for the instructional movement. It has released library instruction from a limited tool-bound and preset formula approach to an unlimited information-based and realistic approach. Theoretically, this new approach should introduce students to the vagaries of research and equip them to handle the unlimited choices of information sources and search possibilities available to them in the expanding information universe. But does it?

Concepts alone do not seem to be the answer. Anecdotal evidence from instruction librarians across the country suggests that, while practitioners are eager to incorporate conceptual approaches into their instruction, they are often disappointed in the response of their students. Frequent complaints are that "They don't seem to understand," that "They need the basics before they are ready for concepts," and that "They cannot apply the concepts once they are in the library."
The teaching of concepts (including, for example, evaluation of materials, publishing cycles for disciplines, selection of information sources, development of a database search strategy) can only be successful if it is recognized, as Rudd and Rudd (1986) did in their discussion of information overload and the decision-making process, that concepts inherently require students to use critical thinking skills. Most importantly, critical thinking skills cannot be taken for granted, even among college students.3

If instruction librarians examine the concepts that have been articulated as important to instructional efforts (e.g., Oberman & Strauch, 1982; Beaubien, et al., 1982; Reichel & Ramey, 1987; Baker, 1986b, among others) it is clear that most of these concepts demand that students operate in the world of abstraction. McInnis's (1982) use of metaphors to discern the relationship of publications to one another, Keresztesi's (1982) description of the growth of a discipline and its parallel bibliographic structure, and Baker's (1986a) database as a conceptual model are all exemplary conceptual approaches to library instruction. In every instance, however, students must engage in what is most likely unfamiliar cognitive territory. As such, library instructors' expectations may exceed students' cognitive abilities.

Library instruction, over the years, has slowly shifted its focus. Its initial concerns were with the lowest cognitive objectives, as classified by Bloom (1984), of knowledge (representing lowest level of learning outcomes, such as recalls of specifics and universals), and comprehension (representing the lowest level of understanding, which does not require establishing relationships to other material). Emphasis is now, appropriately, on the highest cognitive objectives of analysis (ability to break down materials into their component parts so that their organizational structure can be understood), synthesis (ability to reassemble elements or parts to formulate new patterns or structures), and evaluation (ability to judge the value of materials on definite criteria). Analysis, synthesis, and evaluation are all cognitive objectives which demand students to think.

The cognitive skills of analysis, synthesis, and evaluation are nowhere more obviously needed than when students encounter the online information environment. Numerous studies (see earlier discussion) suggest that some students view the online environment as a means of circumventing traditional mechanisms for understanding the relationships between their information needs and information resources. Others face the online environment with trepidation and confusion. Both of these problems may only become exacerbated by the emergence of the supercatalog.

Thus, it is more critical than ever that we recognize the complexity of information concepts and the limited abilities of our students to
adequately understand and apply them. The networked environment, the supercatalog, and the proliferation of microcomputers are moving us toward a "disembodied" library. If the future does indeed take the form of "a single, unified electronic record of scholarship...," as Eldred Smith (1990) suggests in his recent essay, *The Librarian, the Scholar, and the Future of the Research Library* (p. 67), then students need to understand more than what they see on the computer screen. They also must understand a combination of the "how, who, why, and where" of bibliographic concepts and how to search and select from a vast repository of information. If they do not understand the concepts, if they cannot critically apply them, we may be faced with the paradox of building a marvelously sophisticated information apparatus that only a limited few can fully understand and use.

What then is the proper educational response to the online information environment? It must be a new combination of methodology and pedagogy.

Methodologically, instruction librarians must place the online environment in the broader context of the information world. As such, the online environment, and the concepts which are unique to its manipulation, must not exist in an information vacuum. The relationship between the concepts unique to information systems must be interwoven and connected to the broader concepts of information generation, access, and evaluation. The ACRL BIS "Model Statement of Objectives" specifically (and rightfully) ignores singling out the online information environment in hopes of encouraging instruction librarians to approach information as an entire package of interrelated concepts. This methodological approach should provide users with all the important concepts which must be understood and applied in or out of an electronic environment.

Perhaps more radical is the pedagogical implication. While the world of information may be becoming more complicated, the cognitive skills necessary to successfully operate within it remain the same. What needs to change are the teaching methods that instruction librarians use to prepare students to face the contemporary world of information. The complexity of the online environment has given new impetus to this need. It is time to recognize that concepts of bibliographic instruction are complex and abstract. It is time to recognize that most students are not formal thinkers and, therefore, cannot automatically translate abstract concepts into practical applications. It is time to recognize that the cognitive objectives of analysis, synthesis, and evaluation must be overt educational goals.
Finally, it is time to experiment with teaching methodologies, such as active learning, which places primary importance on promoting thinking.

Active teaching, which results in active learning, offers an opportunity for students to discover the concepts which they will need to operate in an information rich environment. Active teaching is a pedagogical tool that assists students in drawing on their own experiences as a bridge to new experiences. It is a tool that allows students to discover and apply concepts to the problem at hand. Most importantly, it is a tool which explicitly demands that students think critically and act creatively.

There are many forms of active learning, all of which are aimed at stimulating abstract and critical thinking. But all of these active learning models rely on four key components which are necessary to create an active learning environment. The four components to active learning are equilibration, group activity, reinforcement and feedback, and application. Each of these components contributes directly to the learning environment. However, the most critical component is equilibration.

Equilibration is a mental process that, according to noted child psychologist Jean Piaget, contributes directly to the cognitive growth of individuals. Taking his cue from Piaget, Robert Karplus (1976), a leader in developing active learning models for science teaching, describes equilibration as "the internal mental process in which new experiences are combined with prior expectations and generate new logical operations" (p. 2). In order to initiate the process of equilibration, or self-regulation as it is sometimes referred to, a situation which provokes disequilibrium must be introduced. The presentation of a situation which requires students to draw on familiar experiences to solve a problem to which the solution may be unfamiliar is upsetting to their equilibrium. The mental discomfort of disequilibrium challenges students to think actively and constructively.

For example, in Oberman’s (1983) active learning model designed for question analysis, students are asked to sort packets of questions into two piles and label those piles. The questions are benign so students are not puzzled over jargon. They must, however, determine the distinctions between questions (i.e., short or long; fact or research; objective or subjective). This is an exercise in disequilibrium. It is designed specifically so that students can draw on their familiar experiences with such questions, while forcing them to create and test hypotheses about how the questions should be categorized. The result is that they are forced to think about the types of answers these questions require and the differences between these answers.
The purpose of disequilibration is to create a situation which demands active thinking on the part of students, active thinking which requires them to discover, on their own, a new pattern or new idea. This self-discovery, as is true with most “learning by doing” activities, has the added benefit, at its best, of students remembering what they discovered and transferring the principle to a new problem.

The creation of disequilibrium in a classroom, however, must be well managed. Nothing is more counterproductive than giving students an exercise which results in frustration and ends in despair. Thus it is critical to the success of any self-regulation exercise to ensure (and control) the level of frustration. One of the easiest ways to reduce anxiety among students when asking them to solve an unfamiliar problem is to have them work in groups. Group activity, the second key component to active learning, is a powerful technique in a learning environment.

The worth of group activity behavior in learning activities (Bouton & Garth, 1983) has been well documented. Four important advantages are consistently ascribed to group activity. First, in any group a natural leader emerges from within the group. This ensures that the group will perform the task at hand with minimum intervention from the teacher. Second, quicker learners in the group will assist slower learners. Peers are responsive to one another and demonstrate a patience in explaining problems and processes to one another. Third, students feel more comfortable in offering ideas, exchanging thoughts, and contributing to discussion in small groups. Interaction in small student groups is most often lively and free of the constraints of public exposure. Finally, group activity usually results in an increased interest in the learning activity at hand because it eliminates the potential for individual frustration.

Active learning, however, is not wholly dependent on group activity by students. Active learning requires the teacher, or leader, to assume the roles of manager, expert, consultant, and interpreter. These roles are best played by providing appropriate reinforcement and feedback to students at critical junctures in the active learning sequence. Reinforcement and feedback can take either an oral or written form. During group activity, the leader is actively engaged in visiting each group, listening, offering advice, answering questions, and even gently guiding groups in their discovery process. Again, this active role reduces the potential for frustration by making the leader available during the exploring and thinking process. Written reinforcement and feedback is also a powerful teaching tool. It allows the teacher, in the role of expert, to confirm the solution or solutions
to a disequilibrium activity in a positive and constructive manner. It also enables the expert to expand upon the solution of the problem through additional explanation or illustration.

Finally, the active learning model must incorporate an application stage. The application stage ensures that the discovery of a concept or skill through group activity can be generalized to a new problem. Application reinforces the concept being taught, while at the same time, it may involve further cognitive challenges. For instance, in the question analysis example, the sorting of cards into two distinct piles was a prelude to introducing the concept that different types of questions require different research approaches. The next step is taking one of the “research-like” questions and narrowing it by a set of criteria (time, place, interest groups, etc.). The exercise ends with an application that requires students to use what they have learned and apply it to a new and different question.

Active learning, then, is built on the assumption that critical thinking is, perhaps, even more important than subject content. In other words, if students can think critically about broad general principles, then they are more likely to be able to apply those principles to new and different problems. (For further information on the importance of critical thinking to education, see, Paul, 1990.)

Providing students with the cognitive tools to make informed decisions must become a keystone of library instruction. Students unable to cope with the overwhelming number of choices available to them will be further disenfranchised from the information structure. The allure of the online environment, whether in its singular CD-ROM format or its more complicated networks of databases, is powerful. Intelligent use of these new tools is essential to maximize efficiency and reduce frustration. Equally important is the emphasis that must be placed on the relationship of other information sources and their structures to the online environment.

The information world, particularly the electronic information world, is like a supermarket stocked with limitless varieties of resources. In this environment it is imperative that students face the choices on the “shelves” with the ability to discern which of the available products are appropriate. The alternative is that students, much like my friend facing the endless shelves of cereal, will turn and walk away.

ENDNOTES

1. Carol Kuhlthau is currently working on a study with Rutgers University students.
2. The author has conducted numerous instructional workshops on conceptual approaches and active learning for bibliographic instruction across the United States and Canada over the past ten years. The anecdotal evidence is drawn from hundreds of conversations from practitioners in the field.
3. According to Inhelder and Piaget (1958), there are four stages of cognitive development: sensorimotor, pre-operational, concrete, and formal (abstract). The earliest stages, sensorimotor and pre-operational, are cognitive growth stages which mature from infancy to age six. The concrete thinking stage, which is characterized by being able to use known experiences to solve problems through simple associations and step-by-step instruction, is complete by age eleven. By age thirteen, a concrete learner begins the transformation to a formal or abstract learner. The formal/abstract learner is able to think in theoretical terms, can reason with concepts, relationships, and abstractions, and can plan lengthy procedures given overall goals and resources. Studies, such as Tomlinson-Keasey (1975), refute Piaget's belief in a natural and inevitable development of cognitive development and suggest that most college students are not formal/abstract thinkers.

4. For examples of active learning models adapted for library instruction, see Oberman (1983) and Oberman and Linton (1982).

5. For a more detailed explanation of equilibration see Oberman (1983), pp. 24-25.

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Learning Style Theory and Learning Transfer Principles During Reference Interview Instruction

Randall Hensley

Abstract
Learning style theory, as it is understood by theorists in educational psychology, can be applied to the reference desk interview process by knowledgeable staff in order to facilitate more effective interactions. Learning styles are key elements to consider when matching staff responses to the instructional content of user assistance. This article will examine the applicable issues of learning styles and learning transfer for the reference interview.

Just like adolescents separating from their parents, bibliographic instruction (BI) grew up in the reference desk household but "left home" to develop its own perspectives. A major influence on the development of BI has been educational psychology. Conceptual frameworks (Reichel, 1981) and question analysis (Oberman, 1983) exemplify this influence. Learning style theories and learning transfer principles are some of the recent issues to impact the instructional programs of libraries (Bodi, 1990).

The impact of new information technologies upon libraries has caused renewed interest in teaching and learning for reference services. The reference desk staff has become acutely aware of instructional issues as they cope with users of online catalogs, CD-ROM systems, and locally mounted databases. This situation has driven the return of BI issues to traditional reference services.
Learning style and learning transfer theories offer insight to the reference interview process that can enhance staff abilities to provide quality instruction at the reference desk. They can contribute to the development of a library user's information-seeking skills.

Carl Jung (1923) identified four basic human functions: (1) the thinking function of organizing and analyzing in a logical fashion; (2) the feeling function of personal and emotional reactions to experience; (3) the sensation function of perceiving and reacting to immediate sensory information; and (4) the intuition function of imagination and abstract thought. Subsequent learning style models have focused on perception and communication as key indicators of style. A learning style is a pattern of these indicators. Individuals have the capacity to operate in all styles but prefer a particular style as being more natural or easier to manifest. The less preferred styles require more effort. The preferred style is most in evidence when interacting with other people and is the optimum form in which to communicate. Researchers (Mok, 1975) have also identified the phenomenon of preferred styles shifting under stressful or unfavorable conditions.

A variety of models have been developed that include inventories for identifying and understanding an individual's learning style configuration. David A. Kolb (1976), Paul P. Mok (1975), and Isabel Briggs Myers (1962) created perhaps the most widely known inventories. Labels have been developed for particular styles, typically four. Strong correlation is present between the inventories. For the purposes of this article the Mok labels will be used.

There are characteristics associated with learning styles. The "thinker" style is deliberative, objective, rational, analytical, unemotional, and serious. The "feeler" style is personalizing, emotional, empathetic, spontaneous, subjective, and impulsive. The "sensor" style is pragmatic, action oriented, competitive, focused on the tangible, efficient, and directive. The "intuitor" style is imaginative, idealistic, broad-gauged, conceptual, scattered, and probing. A style is in evidence when these and analogous characteristics constitute a regular pattern of perception and communication.

While no reference librarian will be able to administer a learning styles inventory at the beginning of each reference desk interaction, there are nonverbal and verbal cues that are indicative of an individual's style (Gregorc, 1979). Sources of nonverbal cues are eyes, gestures, body placement and stance, and facial expression. Each of these sources can vary according to quality and quantity of action or movement. Verbal cues consist of quantity of words used during
the interaction, vocal tone, verbal responsiveness, and types of words used. This last cue has four categories: authority words, action words, affect words, and conceptual words.

When applied to the previous learning style labels, certain characteristics can be identified as common attributes. For the thinker style, the nonverbal attributes are stiffness and formality, and the verbal attributes are articulateness, definiteness, succinctness, and an emphatic quality. Individuals with this preferred style present their information need in a logical, relatively unemotional manner. They accept a large amount of responsibility for the outcome of their work in the library. They expect the librarian to be authoritative and knowledgeable, and they appreciate ranked alternatives from which they, the user, can choose. They avoid a personal or informal interaction, and place an emphasis on the details of any action to be taken or resource to be used. Printed instructions are likely to be consulted comprehensively.

For the feeler style, the nonverbal attributes are expressiveness with connecting, informal gestures, and body stance. The verbal attributes are noted for an emphasis on affect and personalizing. Individuals with this preferred style present their information needs in a personable manner, obviously enjoying the opportunity to interact with another person. They often express anxiety, pleasure, or ignorance willingly as a means of enhancing the personal aspects of the process.

For the sensor style, the nonverbal attributes are impatience and movement with an emphasis on tactile responses such as tapping a pencil, grasping handouts, or other gestures that indicate a desire to move to a conclusion quickly. The verbal attributes are noted for an emphasis on action words with practical or simplistic explanations about what is desired.

For the intuitior styles, the nonverbal attributes are a distracted manner, often giving the impression that the individual is not paying attention or that the individual is engaged in an internal dialogue. The verbal attributes are noted for an emphasis on verboseness, an inability to focus the nature of the information need, and an ability to frame the need into broad categories. Often the connections between statements or questions are not clear.

The person with a dominant thinker style learns through detailed analysis and logical ordering. A cautious, deliberative, comprehensive assessment of a learning situation is the preferred approach.

Unlike the thinker style, the feeler style learns through personal interaction, placing emphasis on the acknowledgment of feeling, attitude, and involvement of the people engaged in the learning
process. The sensor style learns by doing; action is paramount to comprehension. Explanations or extended dialogue without concrete tasks or results often frustrate individuals with this dominant style.

The intuitor style learns through conceptualizing, creating categories of possibilities, ramifications, and alternative avenues. Often individuals with this dominant style engage in anticipatory problem solving and long-range planning. They may consider a variety of options and desire to engage in a great deal of brainstorming prior to taking action.

Smith and Renzulli (1984) have examined the learning style literature regarding the desirability of matching students to learning environments. It is the contention of this article that the job of the reference desk librarian is to match their responses to the learning style characteristics exhibited by the user. This matching process enhances clear communication, retention of information imparted, and ultimate transfer of learning to new situations.

Some general strategies for matching user learning style by the librarian are offered. First, focus on understanding the information/instructional need from the user's perspective. Concentrate on the words and physical behavior. Watch for the various cues previously identified.

Second, the librarian should sequence responses into segments that create the opportunity for further learning style cues, adjustments, and time for the user to engage in the instructional process. An increased emphasis should be placed on the technique of follow-up—initiating learning at a particular step of the sequence, then re-engaging interaction so as to better gauge the learning style operating in an altered situation.

Third, the librarian should be aware of possible shifts in learning style because of stressful or unfavorable conditions for learning by the user. Experiencing anxiety about using the library is perhaps more prevalent than librarians acknowledge (Mellon, 1986). By sequencing the reference desk instruction and engaging in follow-up, a manifested, stress-induced learning style can be unmasked for the dominant preferred style.

The fourth general strategy for matching librarian interaction with the user's learning style is providing alternative information sources. Classroom experiences support this approach (Guild, 1982). Signs, handouts, and other people at the desk and at different library locations can alleviate the difficulty in identifying a particular user's style and can assist in the sequencing of instruction previously discussed.

More specifically, for the thinker style, it is important for the librarian not to pressure the user; often pressure is misconstrued as
questioning the user's style, authority, and responsibility. It is useful for the librarian to verbalize the rationale behind the strategy being offered, to provide plentiful details, and to offer alternative approaches in a logical manner from which the user can choose.

For the feeler, the librarian should empathize, personalize, and encourage the user to return for further assistance. Users with this preferred learning style will regularly seek further interaction.

For the sensor it is important to take action as soon as possible, offering instruction in the process of using resources.

For the intuitor, a longer period of listening is required until central issues can be discerned or until some place from which to start can be identified.

For all learning style types it is important to listen, alter words used by the librarian, monitor body stance, be conscious of the mixture between action and talk, and become comfortable asking for intervention from a colleague or finding some other way to take a "time out" in order to clarify the components of the instructional interaction.

Telephone reference assistance is often problematical for reference desk staff. Pressures of time and the configuration for provision of telephone assistance can cause difficulties. An awareness of learning styles can provide avenues to more successful interactions. While nonverbal cues are not applicable, verbal cues are plentiful. Paying attention to the structure of the conversation is crucial. Is the conversation logical and organized or is it scattered? Is there an abundance of certain categories of words such as authority words or affect words? The matching strategy of the librarian is to structure the conversation in accordance with the perceived verbal style cues.

A preferred thinker style caller will respond to an acknowledgment of caller suggestions, to the citing of sources consulted, to requests for clarification and verification.

A feeler style caller responds well to moving through the information process in an interactive manner, relying on descriptions of what is being done and enthusiasm for the steps taken and the discoveries made.

For the sensor style caller, being put "on hold" is frustrating. A more useful strategy is to take the user's telephone number and provide an estimated time when the call will be returned. Minimal probing is a recommended strategy. Callers respond well to call backs.

For the intuitor style caller, the librarian will need to listen for awhile until connections become clear.

Responding to user learning styles involves practice as all reference instruction techniques do. Learning style techniques can be incorporated into the repertoire of skills that reference desk staff
develop. They are particularly useful with problematical interactions when evidence accumulates that indicates communication is breaking down or when the instruction is not achieving desired outcomes.

It is the issue of desired outcomes that links learning style theories with learning transfer principles. Once again, there is a substantial body of literature regarding learning transfer principles (Ripple & Drinkwater, 1982). A major desired outcome of a reference desk instruction interaction is the ability of the user to transfer what is learned from one interaction to a new situation.

Initial learning and retention of that learning is key to the learning transfer process. Learning style applications function to optimize the preferred patterns for learning and support the learning and retention process.

Three principles of learning transfer are crucial links to learning style theory (Selz & Ashley, 1978). First, what elements of the instructional interaction transfer to other situations must be identified intentionally. The timing for imparting the transferable components of instruction will vary between styles, but it must occur.

Second, arranging the components of the instruction according to similarities among them encourages transfer. Prior learning impacts subsequent learning. Arranging instruction into sequences has been mentioned earlier. Depending on the learning style, these sequences can be concepts, specific tasks, strategies, or a series of interactions.

Third, providing practice in the instructional process is vital. Learning styles awareness provides a mechanism for involving the user in the learning process by focusing on an approach that has the most meaning to that user. Providing guidance for learning transfer is enabled by creating effective communication through the use of learning styles characteristics.

Growing evidence exists that learning style theory and learning transfer principles are applicable to bibliographic instruction situations. The BI aspect of library services is destined to continue its development by adapting knowledge from other disciplines in addition to creating and modifying its own knowledge base. Librarians have long professed a belief that one-on-one instruction at the reference desk is indeed BI in a different mode. The new information technology is increasing the demand for this mode. Therefore it is important that provocative inquiry concerning instruction theories, principles, and practices as they apply to reference desk instruction accelerate. It is time to welcome home the knowledge gained from librarians in the classroom to the increasingly important reference desk arena.
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Making Connections: Teaching Information Retrieval

Betsy Baker, Mary M. Huston, and Maureen Pastine

ABSTRACT
The focus of this article is on the necessity of making connections when teaching information retrieval—i.e., connections between graduate library school education and the practitioner; between learning strategies and library staff development and library user education programs; between basic library user education and lifelong learning skills; and between the library and the classroom, the library and media services, the library and computer centers, and the library and its users.

In order to assist library users in successfully accessing a host of local and remote systems—in both online and CD-ROM formats—library professionals are encouraged to accept a leadership role. They must facilitate end-user instruction in meaningful ways so that independent, individualized learning through electronic access is assured.

A comprehensive framework has been described to teach the process of online and other electronic-based information retrieval. Educational content incorporates cognitive, conceptual, and mental models. Communications analogies and a database model are stressed as being fundamental to teaching. Progressive and continuous
learning and development of expertise will lead from personal knowledge to societal knowledge through enhanced searching expertise.

**INTRODUCTION**

College and university librarians have a commitment to the provision of quality service to faculty, students, and other constituencies. Library-user education is usually high on the list of priorities of an academic library. Yet a large majority of graduate schools of library and information study do not teach prospective librarians how to teach (Pastine & Seibert, 1981, pp. 169-71; Larson & Meltzer, 1987, pp. 9-16). Graduate library schools need to incorporate learning theories, psychological and sociological behavior theories, and lifelong learning skills into their curricula or encourage students to enhance their education outside of the library school curricula in this area. Without a broader perspective on the teaching role, practicing librarians have had to develop on-the-job theories which are relevant to user education. In part, at least, this explains why much of the early (and even some of the current) library-user education programs focus on physical library orientation and offer only tool specific instruction. Library school students have been taught how knowledge is created, structured, organized, and manipulated, but more emphasis could be placed on learning behavioral theories so that, as instruction librarians, their ability to teach others can be strengthened.

Despite this situation, many of these graduates have been creative in their work environments (see, Schon, 1983, for a discussion of this phenomenon in other fields). Independently, they have exhibited the skills necessary for lifelong learning and ferreted out literature—much of it outside their own field—which is useful in assisting and teaching users. Most recently, many have embraced the challenges of humanizing information technologies. As one university administrator remarked: "On this campus, the librarians are the leaders in initiating the implementation and use of new technologies and telecommunications activities that have led to improved lifelong learning and innovative research and teaching."

On many academic campuses, the technologies first implemented in libraries have brought together new work groups that cross disciplines and/or administrative units. New ties have been created among the library, the classroom, media and instructional services, and computer centers. And further ties are almost certain as campuses adopt highly developed telecommunication systems in preparation for interactive and integrated voice, video, and data information
sources. Technologies are changing the ways in which we function, the ways in which we think, and the ways in which we access and manipulate information (Vondran, 1990, pp. 27-36).

In today's society, individuals must be sophisticated enough to formulate appropriate access strategies for information in diverse disciplinary fields. This strategy formulation requires understanding of the structures of information and bibliography. It also requires the ability to judge the contextual adequacy of retrieved information, given the purposes underlying information needs. Ultimately, retrieval is inextricably linked to individuals' knowledge growth and development and society's cumulative knowledge base development (Huston & Oberman, 1989, pp. 199-212). As new technologies, automated systems, and electronic formats replace labor-intensive manual systems, the need for greater expertise in learning theories and behavioral motivations becomes a necessity for information professionals executing both routine and specialized job duties, especially user education programs. Librarians as experts in the organization and retrieval of large stores of information must assume leadership responsibility in teaching computer literacy to students (Aluri, 1989, pp. 213-22). The focus of this article is on the necessity of making connections related to end-user instruction—connections between graduate library school education and the practitioner; between learning strategies and library staff development and library-user education programs; between basic library-user education and lifelong learning skills; and between the library and the classroom, the library and media services, the library and computer centers, and the library and its users.

In order to assist library users in successfully accessing a host of local and remote systems—in both online and CD-ROM formats—library professionals are encouraged to accept a leadership role. They must facilitate end-user instruction in meaningful ways so that independent, individualized learning through electronic access is assured.

Because users must possess interdisciplinary perspectives to function in the contemporary information environment, librarians have expanded user education programs to accommodate a broad overview of the information environment, including necessary technological competencies. Again, without their having a background in educational theory and psychosocial behavior, progress has been slow (Baker, 1986, pp. 35-41; Baker & Sandore, 1990). Recently, however, user-based conceptual instruction has been developed for educating and training users “today for tomorrow's systems” (Huston & Mazzuca, 1990, pp. 77-84).
Evaluation of Electronic Research Instruction

Various user studies have found that instruction for searching must provide not only basic procedural information but also conceptual knowledge. Knowledge of database structure, for instance, is fundamental to retrieval in diverse systems.

End-users can now expect to interrogate multiple files to satisfy their information needs. Increasingly, integrated systems are being seen as the mechanism for managing and interrogating local resources and, as well, for reaching beyond the boundaries of immediate collections to other libraries' OPACs and to commercial CD-ROM and online databases. Realizing the enhanced potential of these linked systems requires considerable expertise among both library staff and library users.

In the use of online systems, literate inferences and predictions are facilitated by both procedural competence and conceptual understanding. More specifically, instruction must provide appropriate conceptual concepts of the information universe in general and the electronic environment specifically. In order to respond to changing information needs and to help users formulate appropriate search strategies, instruction must convey the distinguishing characteristics of various media, telecommunications, and databases.

Technology based developments have rapidly increased the records of human experience and access to this knowledge. Digitized libraries could support independent, individualized learning through electronic access to information. Much, then, is at stake in properly employing these technological innovations and this, in turn, relies on staff and users who have been taught to exploit the new systems to their fullest extent.

For users to realize the power of the technology, staff must receive advance and ongoing education. Yet, libraries often fail to recognize the human requirements which are the foundations for successful new information technologies. This is unfortunate because the installation of any new system in the library can be traumatic and proper orientation can reduce resistance to change. In this sense, since the success of a technological innovation depends to a great extent upon the cooperation, interest, and expertise of those who manage and operate it, “changing technology is as much about changing attitudes as it is about bits and pieces of equipment” (MacMorrow, 1987, p. 104). Every staff member, regardless of his/her responsibilities for and relationship to a new system, needs a basic understanding of computerized retrieval. End-users, too, must be adequately oriented in order to operate effectively in the increasingly integrated and rapidly changing information environments.
Library staff and users must receive enabling education; training alone is not enough. Mastery of the mechanical aspects of operating a system may ensure some results, but it is only when the conceptual aspects are understood that users can truly exploit systems. Without proper instruction, "the necessity of adjusting to the library's way of representation can act as a barrier to success and satisfaction." In other words, "users need a comprehensive framework in order to assimilate all the seemingly discrete activities that take place in the process of information retrieval" (Dalrymple, 1990, pp. 272-81).

Questions concerning educational content are certainly a frequent preoccupation of those who teach, a mission which cuts across all disciplines. There are many unanswered questions in the educational process. How do people learn? How and what should be taught? What constitutes a learning experience? and Does that differ from the traditional concept of "being taught" in the strict pedagogical sense (Baker & Sandore, 1989)? The educational challenges implied by these questions have provided the impetus for the research-based programs reported in this article.

TOWARD INTERCONNECTIVITY IN END-USER EDUCATION

Both research and experience have demonstrated the difficulty of using any one teaching method, given the diversity and range of users' learning styles and knowledge levels. However, it is now generally agreed that information storage and retrieval systems instruction should be based on concepts which are transferable to teaching about information retrieval systems. Concepts address users' greatest difficulties: formalizing their information needs, selecting appropriate terminology, and developing search strategies that can exploit the interactive power of any system.

How is it possible to determine what to teach about systems? The most practical approach is to observe some of the common problems that users experience with online searching, either directly or through online system transaction monitoring techniques (Nielsen, 1986, pp. 28-34). Research findings suggest that users are rarely aware of a large portion of available search options, nor do they necessarily understand or correctly employ search options even if they are aware of them. Users are often confused over too many search options—e.g., when does one use a Boolean search technique over a keyword title access search? In lieu of a theoretical understanding of how to make such a judgment, many users rely on their previous experiences when making decisions. Current research also suggests that users are not aware that subject searching can be accomplished by means of controlled vocabulary terms. Similarly, Boolean search techniques and set building are usually techniques known only to seasoned online system users. Furthermore, users tend to make mistakes in clusters, so one error is likely to be followed by another error in online searching.
Without professional guidance, then, the same errors are made repeatedly.

**The Utility of Model Building and Analogy**

Users need a framework in order to organize mentally all of the steps and problems involved in information retrieval. This framework must be capable of adjustment both in the correct approach to, and the process of, retrieving information. It should be a framework that can be easily employed and understood by the user. Therefore, a teaching model must be capable of addressing not only how information can be retrieved successfully, but also how a user approaches this process. Employing an “andragogic” teaching approach, where the teacher acts primarily as a resource to guide and encourage the learner, rather than “teaching” in the strict pedagogic sense, seems to be an effective teaching process for students and faculty members. In *College & Research Libraries*, Glogoff and Flynn (1987) crystallize the andragogic teaching process and its merits for adult learners:

> These authorities contend that adults learn best through a complex process that includes references to past experiences, acceptance of the value of the learning, involvement in directing the process, and hands-on experimentation in a non-threatening environment. In such a system, the role of the trainer becomes primarily that of a resource, someone who supports and validates the competency of the self-directed learner. This experience-based learning methodology is termed andragogy. (p. 530)

In response to the teaching challenges discussed here, user-driven instructional approaches have been developed to mediate between the needs of information seekers and the requirements of information systems. Their evolution reflects consideration of three interrelated dimensions of effective teaching—cognitive models, conceptual models, and mental models.

Cognitive models describe the mental processes by which tasks are performed. They deal with the thoughts, feelings, and behavioral processes that transpire in searching. Conceptual models describe to the user how and why a system functions as it does, as the user is intended to understand it—not necessarily as the system actually behaves. A conceptual model is the framework instructors strive to create with the students. Conceptual models are often built around analogies, graphical displays, and other descriptive techniques designed to communicate to the learner an overall context for system behavior as well as specific aspects of system operation. Mental models embody the user’s understanding of the system, which may or may not conform to either actual system behavior or any accurate conceptual models of that behavior (King & Baker, 1987, p. 8).
Thus, there exist three scenarios, but often only one crucial opportunity to help the user create a correct mental model which will enable him or her to search successfully. The more that is understood about the behavioral processes involved in searching, the more likely appropriate conceptual models will be created. Understanding behavioral processes goes just beyond observing how users input searches but also to gaining insights into the way users function cognitively.

The term *model* is often mistakenly assumed to be synonymous with analogy. An analogy points to similarities and also helps to establish an initial link between the familiar and the unfamiliar. Once the critical link is established, it is important to move beyond the analogy to a model. For example, in an instructional setting where users are accustomed to manual searching, a librarian may say that the card catalog is similar to the online catalog. However, while they may have the same basic function, they do not have the same structure. In contrast, a model need not have the same function as the system being taught, but it will represent the same structure as that system. As such, a model provides the necessary framework for building an understanding of the system’s architecture. The crucial difference between analogies and models is that a model allows a user to move beyond partial, sometimes nonreinforcing, similarities to a foundation that provides a picture of what the structure of the new system will be (Baker & Sandore, 1987, pp. 192-206).

Rather than checking the new system against the old system, a conceptual model enables the user to apply a set of general guidelines in constructing his or her own mental model for the operation of the system. Because instruction is most effective when it is built on an individual’s experiential frameworks, for users not yet conversant with either databases or computers, a preliminary explanation must reference everyday experiences of storing and retrieving information. Such an approach presupposes that “when an individual first acquires information about a computer-based system, the way in which the resulting knowledge is represented will be affected by knowledge of other noncomputational systems” (Foss & DeRidder, 1987, p. 159). Thus, the overall goal is to cultivate the development of mental models in users which enable them to make appropriate inferences and predictions during search decision-making.

**The Communications Analogy**

For individuals unfamiliar with computers—or even the scholarship to which these retrieval tools provide access—a preliminary introduction can prepare them to appreciate instruction about the databases which serve as the building blocks of information.
systems. In other words, before learning about the technical components of computer applications, users must possess a contextual appreciation of their purposes. The communications analogy describes how human communication purposes and patterns have been used to effectively bridge what novices know from their own experiences to what they need to know about scholars' communication practices and resultant research processes. It follows that instruction should be broad enough to include concepts that relate to more than one tool and to organize the concepts into a functional model that is familiar, that can be easily taught, and most important, has a structure that is transferable to learning about the use of numerous research resources. In so doing, the instructor recognizes and extends the user's existing knowledge base.

Comparing a novice's experiential knowledge with a scholar's expert knowledge demonstrates that information transfer is integral to the communication which supports inquiry among both scholars and users. Inquiry through both everyday conversation and scholarly discourse depends on the observation and analysis of experiences, the framing of appropriate investigatory foci, the sorting and weighing of acquired facts, and communication of findings through appropriate channels to interested others. Ultimately, also, it is this knowledge navigation which is the purpose underlying all library information systems. In the scholarly domain, these transactions are, furthermore, organized into a structure of subjects represented through written language and recorded in a published literature. The elements of this structure are books, journals, proceedings, and other documentary forms. In response, librarians are engaged in the collection, organization, and dissemination of this recorded information. They study the particular properties it possesses—i.e., the ways in which it is produced and processed—so as to facilitate its optimum accessibility and usability. They are particularly interested in the bibliographical control of a discipline or subject literature—how well it is indexed and abstracted so that easy access and retrieval can be assured.

**BUILDING EXPERTISE THROUGH THE DATABASE MODEL**

In extending this information transfer framework, the database can be explained in terms of references from familiar database interactions from users' lives. Baker and Sandore describe the database model in a number of publications. The highlights of the model are described in the following paragraphs from their work.

Users encounter databases in their daily routines—via automated banking transactions, talking cash registers, mail order, data processing, and airline and hotel reservations, to name just a few
commonplace functions. As a beginning point in an instructional session, the librarian can draw on some of these everyday experiences to illustrate the concept of a database—i.e., a collection of records in machine-readable format, accessible in a number of ways by a defined set of commands and protocols. Every database potentially has a unique function, but all databases share the same general structure. It is this common structure of the database that makes it an important and particularly successful model in teaching all types of online system use.

Through an overview of the online information environment, individuals can be taught generally what systems can and cannot provide and how they can be manipulated. They can then be told the importance of knowing the scope and content of particular databases, as well as each database’s limitations. Users must next learn how to match information needs with appropriate databases, given the variability in research questions and, as well, in access points. Lastly, they need to know about characteristic access protocols and search commands. Because of the lack of standardization among retrieval systems, instruction must include information about systems’ documentation, such as user manuals, and the retrieval implications of different hardware and software combinations. Building on this concept of the database, two dimensions of instructional content have been identified: (1) teaching a decision-making framework which can be applied when approaching any file of information; and (2) teaching the general structure of how systems operate. Neither dimension is mutually exclusive and both use concepts associated with online catalog and information retrieval system usage.

In teaching each of these dimensions, it is important to actively delineate elements of the learning session that are the teacher’s responsibility and those that become the learner’s responsibility. The teacher describes the concepts and provides examples; the learner remembers the key concepts and applies them successfully. The student, for instance, should become well versed in the access protocols and search commands, which are not standardized across systems. They can cultivate their search efficiency through exploration of the types and formats of information in particular systems. By this means—active discovery—individuals learn to choose between controlled vocabulary searching and free-text or keyword searching. Individuals also learn how to interpret system responses and search output.

In turn, cultivating users’ development of mental models of the structure of the electronic information environment requires that instructors discuss file structure, index generation, database updates and maintenance, and sorting principles. This approach provides
knowledge about system features which is transferable. Its conceptual, problem-solving orientation also supports use of the higher order thinking skills necessary to analyze needs and synthesize strategies. However, this decision-making framework alone does not convey to students all they must know to effectively use an online system. It does not convey to students how information within the database is processed during searching. Although most people recognize that computer logic does not mirror human logic, the less one understands about this processing, the greater the tendency to accept output without questioning its accuracy. Database instruction must therefore be extended to include this background material. The database model can communicate any number of concepts. Cognitive knowledge about a system’s design can enhance the users’ searching ability through the development of the sound mental models necessary to negotiating complex interactive systems. This model has been successfully used in a number of instruction programs—e.g., at the University of Illinois at Urbana-Champaign and Northwestern University libraries.

TOWARD A SYNTHEtic TEACHING MODEL

An integration of the communications analogy and the database model assumes that what is fundamental to a search decision is an understanding of the forces animating the scholarly environment. Conducting successful research requires comprehension of both “who” and “what.” This includes recognition that the knowledge represented by the bibliographic database entries is an outcome of interaction among members of intellectual communities who advance ideas in ways particular to their fields and disciplines. Additionally, search decisions require an understanding of why information is sought. Users must recognize the role of both formal and informal communication in transferring disciplinary information, supporting diverse interpretations, and creating new knowledge. From such a contextual framework, users can successfully develop strategies on how to retrieve online information, given the attributes of relevant information sources and the access characteristics of storage and retrieval systems.

This approach also recognizes that individuals search within an extended information environment containing resources of many media, both recorded and unrecorded. By explaining the kind of information produced in scholarly cultures, novices can then successfully decide when needed information is likely to be bibliographically controlled as published literature. Offering such a contextual framework through analogy prepares students for an
introduction through the database model to the organization of the larger information environment and to the capabilities of systems’ search operations.

Through understanding that retrieval relies on an organization of data that facilitates appropriate selection through defined sets of commands and protocols, system users can begin thinking like searchers. This emergent expertise can be used strategically to situate the context of the question, to navigate the interface, to formulate one or more search paths, and to shift the search to a different pathway.

These teaching approaches build on users' familiar conceptual frameworks. Additionally, unlike tool and format-specific instruction, these approaches provide generic information for finding, evaluating, and using information, regardless of storage and retrieval media. By acknowledging both bibliographic and nonbibliographic entities through the linking of information retrieval with knowledge creation, they appropriately convey to individuals an image of an expansive information universe.

These approaches are illustrative of the experienced based instructional methods necessary to prepare library staff and users to exploit emerging system applications. They were constructed from concepts that relate to more than one automated library system or electronic database. These commonalities were organized into a functional model that was familiar and therefore intellectually accessible to users. Such context-sensitive educational approaches can cultivate users' thinking like searchers about the purposes which drive the construction of both information and systems. They can learn to proceed in a manner which is transferable to learning about access through integrated online library systems both today and tomorrow.

CONCLUSION

Success in navigating the rapidly changing information terrain requires significant ongoing learning by both librarians and users. Since even the most user-friendly systems will require that end-users consult with professional searchers, at least occasionally, broad based enhancement of information access requires that librarians continually build their expertise. Graduate library schools have the opportunity to prepare prospective librarians by ensuring that the curriculum emphasizes the necessity to teach intellectual self-sufficiency among library users.

Success in the information age requires a theoretical understanding of how people come to know and how they use new information; how they assimilate it into their existing conceptual schemes; and how these schemes may be modified in light of new knowledge. So that many may benefit from the insights of others, the professional
must better understand the way in which society comes to know and
the nature of the processes by which personal knowledge becomes
societal knowledge. Similarly, the process by which ideas are
communicated from mind to mind, directly or through various media
and methodologies, must be better understood. In this way, as our
own horizons expand, we can better enlarge the world view of others
(Gassol de Horowitz, 1988).

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Running Backwards from the Finish Line: 
A New Concept for Bibliographic Instruction 

RAYMOND G. McINNIS AND DAL S. SYMES 

ABSTRACT 
IN THIS ARTICLE, WE SUGGEST a means of developing a more secure foundation for a theory of bibliographic instruction (BI). Three forms of inquiry—research, reading, and writing—are presented as interdependent and inseparable. Up to now, BI's theoretical underpinnings have been too limited. This discussion argues that BI theory should incorporate schema theory, composition theory, and discipline-specific vocabularies. Attention is also given to the idea of the bibliographic citation as a concept symbol. 

INTRODUCTION 
Imagine, if you will, a three-legged stool. The label on the seat of the stool is informed self-sufficiency and the three legs are labeled, respectively, reading, writing, and research. Together these three activities form what might be called "the three Rs" of inquiry. Remove one leg and the stool falls. 

Since scholarship comprises three interdependent processes—research, reading, and writing—we incorporate these three skills into our bibliographic instruction curriculum. Essentially through text analysis, a process is employed which appropriates concepts from critical thinking, cognitive psychology, composition theory, and the philosophy of science. This approach uses methods designed to help students visualize what the processes of writing a scholarly paper involve, acquaints them with the values and critical approaches of
scholarship, and introduces them to the various genres of text. This new concept of BI is called “Running Backwards From the Finish Line.” As an approach for bibliographic instruction, it works well in "writing-across-the-curriculum" settings, with librarians collaborating with classroom instructors, but it could be applied in any setting where students are expected to produce scholarly papers.

Of the three legs, research encompasses a much larger array of activities than the other two. Indeed, research is a sort of umbrella term under which the other two fall, along with other activities that are labeled research. Geologists, for example, conduct research by looking at rocks in the field, chemists conduct research with test tubes in the lab, and so on. By using this form of inquiry, they are gathering "data" (for an elaboration, see Webb, 1986, pp. 11-12; MacDonald, 1989). Reading is, of course, one of the main forms of inquiry. Reading is perhaps the most efficient method at our disposal for acquiring information. And writing, the third leg, is definitely also a form of inquiry. Writing is the means of making meaning out of the results of the research. Without writing out findings, communicating what is known from research is neither very meaningful nor lasting.

Originally, our approach was to concentrate primarily on a model paper from a discipline (in this case, a writing-intensive course concentrating on geography). However, after teaching a course in historical methods and analyses and team-teaching a course in the introduction to literary research, we have modified this approach to emphasize the processes of scholarship instead.

THE APPROACH

Briefly, we introduce students to three vocabularies they are expected to know, roughly corresponding to the three legs of the “informed self-sufficiency” stool mentioned earlier: (1) scholarship (research), (2) composition (writing), and (3) discipline-specific usage (reading). Various genres of texts are presented and, finally, we ask students to produce a scholarly product.

Before presenting these activities in detail, however, we need to point out how the approach developed based on principles grounded in text analysis, cognitive psychology, composition theory, and the philosophy of science. In our view, these areas of scholarship can contribute significantly to establishing a theoretical base for BI. While we do not deal with them directly in this article, implicit in the approach are the models of scholarly structures and processes drawn from the philosophy of science, which are elaborated on in other writing (McInnis, 1978; McInnis, 1982; McInnis, 1984; McInnis &
Symes, 1988). Primarily these models come from, among others, Thomas Kuhn, Eugene Garfield, Michael Polanyi, Henry Small, and Abraham Kaplan.

In 1978, we detected a shift in emphasis in learning, from what one learns to how one learns (McInnis, 1978). More evidence of this continued shift comes from George Posner et al. and Kenneth Bruffee. According to Posner et al. (1982), “inquiry and learning occur against the background of the learner’s current concepts” (p. 212). This observation complements Bruffee’s (1982) notion that in education, while some believe the purpose of education is to provide students with a world to understand, others believe that the purpose of education is to help students develop ways to understand the world” (pp. 96-97).

Learning, Bruffee points out, does not occur in isolation. To bolster his argument, he cites sociologists Kurt Lewin and Paul Grabbe’s idea that “learning” involves shifting social and intellectual “allegiances.” Thus, often it occurs not individually, but collaboratively, in groups or communities. Learning this way relieves “emotional stress involved in leaving one community and joining another.” An analogy, for Bruffee (1982), comes from the “support groups” of the 1960s women’s movement (pp. 105-06).

In addition to the advantages of learning collaboratively, cognitive psychologists provide concrete evidence of the advantages of incorporating “schema theory” into BI programs.

In 1982, as a mode of teaching/learning research strategies in academic libraries, we argued that more attention should be given to the heuristic qualities of metaphor (McInnis, 1982). In 1984, we argued that, like metaphor, more attention should be given to the heuristic qualities of mental maps (McInnis, 1984). Today, in 1991, in retrospect, what was needed for a more persuasive argument is familiarity with the concept of schema theory.

Schema Theory

Schema theory is not new. In 1781, Immanuel Kant observed that new information, new concepts, new ideas, can have meaning only when they can be related to something the individual already knows (Carrell & Eisterhold, 1983, p. 553). Friedrich Nietzsche is first to use schema when he describes metaphor as basic to the intellectual process used to establish meaning. “In our thought, the essential feature is fitting new material into old schemas.” C. A. Bowers (1981), an educator, explains this “drive to name, to give meaning, to categorize, involves the use of metaphor, that is, the establishment of an identity between dissimilar things” (p. 272).
Today schema theory is confirmed by cognitive psychologists (Bazerman, 1988, chap. 8; Carrell & Eisterhold, 1983, pp. 553-73; Kucer, 1985; Hirsch, 1987, chap. 2). It concerns the way in which various types of background knowledge affect understanding and recall, including as stated earlier, metaphors, mental maps, advance organizers, and other cognitive devices that were used to recall or incorporate ideas. Current thought distinguishes two types of schemata—formal and content schemata—both of which are part of the repertoire of cognitive skills.

**Formal schemata.** Formal schemata deal with a text's rhetorical structure; these incorporate background knowledge of the formal, rhetorical, organizational structures of different types of texts. Readers are said to possess background knowledge about or expectations of such factors in texts as genre, structure, audience, and purpose. For example, an informed reader in the social sciences has internalized the four-part structure of empirical articles—introduction, method, discussion, conclusion. Until they learn about this structure, novices must struggle to understand where the article is going.

**Content schemata.** Content schemata deal with a text's knowledge content, primarily vocabulary, which is discussed in detail later; these schemata incorporate background knowledge of the content or subject matter of a text. Because many of the terms scholars employ in discourse have prescribed meanings, if they are adequately to comprehend the subject matter, readers need a command of the special meanings of these terms. For example, ordinary-language terms are given specialized definitions; think about how psychologists have given special meaning to "stimulus," "condition," and "fatigue" (Bazerman, 1987, p. 140).

**Cognitive skills.** Cognitive skills depend on formal and content schemata specific to a task at hand. Once we acquire the relevant knowledge, the skill follows. Experts perform better than novices not because they have more powerful and better oiled intellectual machinery, but because they have more relevant and quickly available information. What distinguishes good readers from poor ones is simply the possession of a lot of diverse, task-specific information.

**Importance of Vocabulary for Meaning**

Studies on processes involved in reading and writing are beginning to show how, with language, individuals make meaning out of text. Readers bring both schemata to bear upon what they are reading. To achieve understanding, readers select the most
appropriate schemata for making sense of the incoming words. Meaning tends to break down at the word level. Less proficient students, who need vocabulary, struggle to comprehend word-by-word. If appropriate schemata are not quickly available at the third level of vocabulary (that is, vocabulary of the discipline), the reader is forced to struggle to make sense of words at the time of reading. The reader quickly reaches the limits of short-term memory, meaning he/she painfully restarts the process over and over. Particularly in connection with our third level vocabulary, we elaborate on this point later in this discussion.

ASPECTS OF TRADITIONAL BIBLIOGRAPHIC INSTRUCTION

In this article we focus essentially on innovative principles and techniques in BI; nevertheless, we do not neglect the traditional components of the BI curriculum. But prior to discussing these innovations, it should be specified what we want the students to learn—most fundamentally, to read and interpret bibliographic citations. Without this basic knowledge, students are not able to function as scholars. They cannot, for one, locate materials. The goal is to have students visualize bibliographic citations as central components of scholarly discourse, primarily because these permit writers to efficiently manipulate ideas. Moreover, bibliographic citations symbolically represent the thought that publications contain and are labels for intellectual property (McInnis, 1978; McInnis, 1982; McInnis, 1984; McInnis & Symes, 1988).

In introducing the vocabulary of scholarly research, we begin by defining and illustrating the types and functions of reference works. Using a library handout called "The Vocabulary of Scholarly Publishing," we introduce students to such matters as the labels that identify publication formats, the purpose of scholarship, and the stages of knowledge production. Frequently we take time in class to elaborate on a particular point such as "risk," "argument," "persuasion." At the same time that this exercise addresses these matters, it also addresses issues relating to reading and writing. Example: As soon as you put pencil to paper, you risk being challenged.

With this brief overview of schema theory and review of traditional aspects of BI in our program, we will present principles and examples which we find to be fundamental to inquiry:

—readers contribute more information to interpreting a text than the print on the page (Raimes, 1983);
—writers incorporate more into a text than print on the page (Hirsch, 1987);
—readers do not use all information provided by the text (Goodman, 1967);
—intellectual structures are built by the learner rather than taught by the teacher (Papert, 1980, p. 19).

**Interpreting a Text**

What people understand from the text occurs as they assign new evidence to membership with an appropriate group of concepts already stored in their memories. Cognitive psychologists argue that, to comprehend, we attach new ideas to old ones.¹

**Expectations of Genre**

*What “Audience” Does to a Text*

In the class, we use an op-ed piece from the *New York Times* by New York Senator Daniel P. Moynihan (1987), which students are asked to read for the next class. The article attacks the Reagan policy toward the American budget deficit and the trade deficit, called by pundits the "twin towers." In addition, they receive a chart, adapted from composition theory, which they are to become familiar with. We show students that they come to the piece equipped with more information than they think they have.

We then present to them the issue of identifying one's audience. In doing this, we first discuss our chart containing such terms from composition theory as "purpose," "author," "reader," "audience," "evidence," and "authority." We try to get students to distinguish between the audience of the *New York Times* and those of scholarly articles with the idea that the audience dictates the nature of the text. For example, we convey to the students that, because of contextual differences in discourse, evidence serves a variety of purposes. Early in our education, we learn that primary sources are sources of fact, and that secondary sources are sources of authority. Later, with experience, we understand correctly that distinctions between these two elements depend upon context (McInnis, 1978, pp. 70-72). We then discuss the Moynihan piece and ask the students to fill the chart out according to what they assume about audience and the use of evidence from the *New York Times*. Through this exercise, students soon realize that they know a great deal about both audience and evidence.

*What “Historical Perspective” Does to a Text*

In the above exercise we attempt to demonstrate to students that they know more than they think they do. Historically, they view the world from the perspective of the late twentieth century. Carol
Schneider (1987), vice president, Association of American Colleges, points out, as teachers, we need to spend more time on assignments and less time on content; especially, we need to know more about how students make meaning.

In particular, we need to connect students' existing intellectual frameworks to what we teach. Her example: Students' twentieth century religious views help them understand medieval religion. Our example: Have students consult contemporary accounts of Oscar Wilde to help them understand that the Victorian moral code did not allow discussion of homosexuality.

**INCORPORATING MORE INTO A TEXT THAN PRINT ON THE PAGE**

In a certain sense, this principle mirrors the previous one. The elements writers incorporate into their text are almost too numerous to mention, but they include internalized structures and levels of formality, shorthand referents such as allusions and citations, vocabulary choice, and a vast storehouse of background information. As Ann Berthoff (1981, 1982) has persuasively argued: “It is in the context of writing where meaning is made.” In addition, as mentioned earlier, writers employ, consciously and unconsciously, schema, rhetoric, and specific critical thinking skills. Writers make certain assumptions about what readers know, or, put another way, writers are aware of who their audience is.

**NOT USING ALL THE INFORMATION PROVIDED**

Kenneth Goodman (1967, 1971, 1973), for example, describes reading as a “psycholinguistic guessing game” (1967, p. 126) in which the “reader reconstructs, as best as he can, a message which has been encoded by a writer as a graphic display” (1971, p. 135). He views this act of construction of meaning as being “an ongoing, cyclical process of sampling from the input text, predicting, testing and confirming or revising those predictions” (1973, p. 164).

**BUILDING THE LEARNER'S INTELLECTUAL STRUCTURES**

Students need the opportunity of engaging actively in the processes of thinking that lead to the production of intellectual structures. They need help in experiencing “intuitive” hunches, in establishing, questioning, sharing, and interpreting. Without building the intellectual structures themselves, students tend to lump separate thinking processes together, unaware of the important role played by each process in the development of distinct intellectual configurations (Katz & Henry, 1988, p. 32).
SAMPLE ASSIGNMENTS

Assignment 1. We give graduate students in creative writing an assignment to outline a mystery plot in which they must consult resources in forensic medicine in Houston during the 1950s. They learn that they must become well acquainted with the particular historical period and at the same time learn enough of forensic pathology practiced during the same period to know the identifying evidence for a gunshot wound from a small caliber bullet. Telling them that medical information is organized in different ways from historical information does not provide the students with the same insight that they are able to achieve when they have grasped for themselves the differences in the ways of knowing in these two disciplines.

Assignment 2. In a history class on historical method and analysis, students work with “op-ed” articles. The object of this assignment is to show how we can change a newspaper article (or similar piece) into a scholarly one. Before we give the assignment, the students are taken through the process as a group. Basically, the assignment includes having students: (1) analyze paragraph content to determine organizational structure, (2) write a hypothetical introduction and conclusion, (3) note where sources should be cited or where supporting evidence is needed, and (4) locate in the library selected references cited.

THE MODEL PAPER

Once students become acquainted with such ideas as audience, purpose, and evidence, we can then ask them to transfer knowledge they have learned through analysis of the op-ed piece to actual scholarly discourse. We then introduce them to the concept of a scholarly paper by having them imagine that an op-ed piece is a scholarly article. We ask them to write a periodical’s title such as American Historical Review, American Economic Review, or Annals of the Association of American Geographers in the second “Document’s Name” box of the composition theory chart. Next we discuss how the scholarly “audience” is different from the New York Times “audience,” an act that, as mentioned earlier, dictates significant changes in the nature of the text.

We find that the opportunities for discussion are almost limitless. For example, students discuss how a well-informed public reader differs from a specialized scholarly one. They discuss temporal issues such as the “immediate/topical” newspaper article versus the “longstanding/discursive” purpose of the scholarly article. They also discuss whether it is “informal/expository” or attempts to be “persuasive/argumentative.”
We then begin a discussion of evidence/authority by asking what changes in the document might we expect to occur if footnotes were added. Each student in turn reads sentences from, for example, the Moynihan piece and indicates where footnotes should occur. (In one history class, students agreed on seventeen locations where citations could be expected.) In the process of indicating locations of citations, the students discuss adequacy of definition of terms and concepts, background information, and the "certainty" of statements. In addition, in documenting the various types of evidence popular writers employ, citations are informal and general rather than formal and precise.

We emphasize that scholars also bring more to the text than print on the page. We stress, for example, that, before he became a New York senator, Moynihan was a Harvard University sociologist. When his material was published in the American Sociological Review, he follows the rhetorical conventions of the "audience"—that is, peers in the discipline. He writes like a sociologist, including employing the appropriate citation of references to material produced by others.

Once we have analyzed the op-ed piece, we then look at scholarly discourse in detail. First we introduce its structure and then the prescriptive nature of meaning in its vocabulary. Next we introduce the model paper which students are expected to emulate. It is broken into three analytical levels: (1) organizational structure, (2) appropriated evidence, and (3) research strategy; but, because of the inseparable nature of 2 and 3, these are treated together.

Organizational Structure

In the class, we discuss the three components of scholarly articles (introduction; body, or argument; summary and conclusion) with particular attention given to the introduction. (Earlier, we noted another genre of scholarly text, the empirical article, used for reporting scientific findings. Because it also discusses methodology employed, this type of article differs slightly from these three components.)

We point out to students that, according to rhetoricians and technical writers, different types of scholarly texts incorporate different types of rhetorical structures (Crookes, 1986, p. 58). Following these composition theorists, we suggest that a lack of familiarity with a text's rhetorical structure can hinder comprehension of it (Selinker, 1976, p. 281). "Presuppositional rhetorical information," or formal schemata, the inherent structure of the text, can be either explicit or implicit.
We also discuss how authors of scholarly texts assume readers possess certain background knowledge or content schemata. In our opinion, we can safely assume that similar elements exist in all forms of scholarly discourse. To us, as well as the research literature itself, scholarly discourse includes reference materials such as articles in dictionaries and encyclopedias, chapters in handbooks, and other review type publications. Even abstracts possess particular schemata. Thus, parallel with composition theorists, our experience shows that the organization and rhetorical structure of all scholarly texts should be directly taught (see especially Crookes, 1986).

Perhaps most interesting, and problematical is to teach students that rhetorical conventions also occur in "implicit" forms (Selinker, 1976, p. 281). Because introductions incorporate so many components important for subsequent development of the article, and that many of these elements are implicit, we devote considerable time to analyzing the major components of an introduction. Finally, we forewarn students that since the intent of scholarly discourse is to persuade, introductions need not conform to the models presented if they are sufficiently convincing without a more elaborate structure. Regardless, because it is believed that teaching the structure of introductions provides students with a good model, we find that this attention has a double payoff: they read better and they write better.

The Four-Part Scheme of Introductions

As part of the course work, we discuss with students regarding what constitutes an adequate introduction. Introductions: (1) tell readers the article's purpose; (2) review the current state of knowledge about the topic; (3) map out the article's organization; (4) suggest what conclusion will be drawn from the evidence; and (5) begin to define terms the article discusses.

In addition to our evidence, John Swales and other composition theorists have gathered empirical evidence that shows, through evolution, that introductions generally have a four-part scheme which is designed to: (1) establish a writer's credibility or authority, (2) review what is known in the field, (3) develop a justification for the present study by preparing for present research, and, finally, (4) introduce present research. That is, to demonstrate a command of the field, the author argues that this study adds new material to existing knowledge. Swales labels this activity "making space" (Swales, 1987a, 1987b; Crookes, 1986; Arrington & Rose, 1987).

To demonstrate the validity of this approach to analyzing the structure of introductions to scholarly papers, we take one preselected paper and analyze its introduction according to this four-part scheme to see whether it fits. For example, in geography, we use an article
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by Michael Solot (1986). In this article, even though the "literature review" is minimal, it does fulfill the literature review function by summarizing selectively some relevant existing research. In addition, we show students how the "map" that the author provides in the introduction forecasts what he is going to cover in the text of the article.

Prescriptive Meaning in Scholarly Discourse

At this point, we introduce students to the notion that meaning tends to be prescriptive in scholarly discourse. That is, a concept has meaning only because scholars prescribe a meaning to it. And further, a particular concept's meaning is valid only if scholars in the same field agree to it having the same meaning. We show them how the American lexicographer, Sidney I. Landau (1984), helps single out distinctions between prescriptive and descriptive meanings to concepts as they are used in scholarly discourse when he speaks of meanings either "extracted" or meanings "imposed."

Using Landau’s method, we distinguish between the way words are defined in lexical (that is, standard) dictionaries and how words such as labels for concepts are treated in "subject-field" (or specialized) dictionaries. We show them that, in lexical dictionaries, general words are defined on the basis of citations from specific texts that illustrate how particular words are used. The particular meanings of these words are extracted from the context in which they are employed in sentences, as in the *Oxford English Dictionary*. In subject-field dictionaries, on the other hand, students are shown that terms take on special meanings "imposed on the basis of expert advice" or are prescribed.

Using our own article as an example, we demonstrate how David Riesman develops prescriptive vocabulary in *The Lonely Crowd* (McInnis & Symes, 1988). We demonstrate that, as is the tradition in scholarship, a scholar's special definitions of particular terms are considered valid by other scholars when scholars employ these terms in their own discourse and attach the same meanings to them. As argued earlier about content schemata, in order to understand their assigned readings and successfully engage in scholarly inquiry, students need to be made aware of such matters. As an added benefit, using our own article helps students understand that the principles and procedures presented are apropos.

Appropriated Evidence and Research Strategy

At this point, we convey the idea that scholarship is an adventure, a matter which is elaborated on further in the discussion of writing as the third "R" of inquiry. But before we expect students to discover
how writing is a way of learning, they are walked through the process of writing by using our own texts as well as the other texts discussed. In fact, many composition theorists argue that in the act of composing, or writing, we make knowledge. This idea represents a fundamental shift in understanding how we learn to write.4

In doing this, we establish dialogue with students about these questions of the writer and the writing process: Since the writer has appropriated the work of others, what is original about this article? What would the writer do if the material appropriated was not available? What did the text look like from which the material was appropriated? How does the appropriated material help the writer's argument? How did the writer locate the material? To help students understand these processes, they must come to class with a question that they want to discuss concerning the evidence the writer has appropriated. Inevitably, this exercise reveals that students, often very bright ones, do not understand the basic conventions of scholarship. For example, we have had students who thought that since the writer did not use quote marks, an indented quote was plagiarized.

We also discuss the concept that evidence, including the bibliographic citation, the label that identifies evidence, functions both as a concept symbol and as a rhetorical convention (for elaboration of these points, see McInnis & Symes, 1988). This exercise obligates students to think critically about the material located and how the writer uses discourse to make meaning and knowledge.

**Writing as Inquiry**

Writing, the third leg of our example, is, as we stated earlier, also a form of inquiry. Writing is a way of making meaning out of the results of research. We point out to students that, without writing down the findings, communicating what is known from research is neither very meaningful nor lasting. In this exercise, students have a framework with which to begin—that is, instead of starting “from scratch,” they build on the existing paragraphs of the op-ed piece. Although at this point writing is given special emphasis, we try to incorporate all three forms of inquiry. In the process, students discover more about how to conduct research and locate evidence in a library, how to read critically, and finally, how to compose scholarly text. The students gain incentive to engage more actively in the exercise from their oral presentations of their op-ed pieces. Students' texts are entered on a computer's hard disk and then projected on a screen. For a half hour each, students indicate what they did and why they did it. We find that the evidence is compelling that the students have benefited from the materials and principles presented throughout the course. As everyone knows, when
students have to explain their ideas to others, they must first clarify their ideas for themselves. Each student acquires an understanding and appreciation of why evidence is an essential component of discourse and how, depending on the anticipated audience, it is incorporated into a text.

**CONCLUSION**

In this article, grounded in our personal experience and the research of others, we suggest a means of developing a more secure foundation for a theory of bibliographic instruction. We present a three-legged framework that gives a more realistic picture of what inquiry comprises. That is, we view the three forms of inquiry—research, reading and writing—as interdependent and inseparable. Up to now, in our view, BI's theoretical underpinnings have been too limited. Instead, we argue that BI theory should incorporate the richness of schema theory, the empirical evidence from composition theory, and the vocabularies we expect students to know: (1) scholarship (research), (2) composition (writing), (3) discipline-specific usage (reading). We give particular attention to the ideas of the bibliographic citation as concept symbol and the prescriptive nature of meaning in scholarly discourse. Finally, we present various genres of texts, and students are asked to produce a scholarly product.

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**NOTES**


2. Jeanne Fahnestock (1986), a composition theorist, argues 'certainty of statement' is the means of 'accommodating' scientific texts to a broader audience. She elaborates how these writers make more definite the highly qualified statements in scientific texts and change vocabulary to emphasize interest rather than technical accuracy. Because similar types of vocabulary, etc., are employed by writers of op-ed pieces, we assume how, in relation to scholarly texts, the same conclusions can be drawn about the certainty of statements in them.

3. We were in part inspired by Larry Selinker and others who study the difficulties speakers of English as a Second Language (ESL) encounter. They found that ESL students are often unable to comprehend content of scientific texts even when they know particular meanings of words, but we also discuss in McInnis and Symes (1988) how vital a knowledge of the prescriptive nature of meaning is to discourse.

4. For the beginnings of this important shift in focus, see Knoblauch & Brannon, 1980, 1983. For other views of the relationship of learning and composing, Knoblauch

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Research and Information Retrieval Among Academic Researchers: Implications for Library Instruction

Stephen K. Stoan

Abstract

The question of library instruction for faculty is linked to the issue of whether they use the library effectively in carrying on their research. Librarian-generated studies have tended to concentrate exclusively on the frequency of use of reference sources—principally abstracting and indexing systems—largely ignoring the broader intellectual and social context in which scholars function as information-generating and information-seeking individuals. Nonlibrarian researchers have been principally interested in the overall communication processes within the research community analyzed as a social system. Both bodies of literature are generally agreed that researchers do most of their information gathering using a variety of informal techniques that cause them to bypass the formal apparatus of the secondary literature or consult it only on occasion. A third body of literature that has sought to analyze the effectiveness of indexing systems has generally concluded that, for scholarly purposes, they leave much to be desired. They are incapable of incorporating the perspectival dimension needed by the scholar seeking to do original or creative work in a field. One can therefore make a strong case that the information-seeking behavior of scholars is both logical and successful given the nature of the intellectual work they are doing and the limitations of the access literature. The most extensive efforts at education have thus far failed to bring about a change in the behavior of researchers and are unlikely to do so in the future.
INTRODUCTION

The question of library instruction for faculty is linked to the issue of whether they use the library effectively in carrying on their research. The literature on this issue has been somewhat bifurcated. On the one hand, there is a body of literature generated by librarians which "has been devoted to user studies that treat selected types of information-acquiring, or input, behavior as isolated phenomena and assume that these phenomena can be studied with little or no concern for any interactions with other communication activities" (Orr, 1971, p. 143). The surveys done by librarians have been largely unidimensional, concentrating on ascertaining the frequency with which faculty use bibliographies, indexes/abstracts, or databases that fall within the purview of reference librarians. Findings that faculty make use of a variety of other techniques to satisfy their bibliographic needs tend to be interpreted negatively and seen as justification for enhanced instructional activity designed to increase use of access tools, though what level of use would be considered appropriate or optimal is never clearly defined.

A second body of literature has been produced by nonlibrarian researchers interested in scholarly communication as a social system. This approach is more holistic, emphasizing both "informal" and "formal" channels of communication and information retrieval. It also distinguishes between "regular needs," which must be satisfied on an ongoing basis, and "episodic needs," which occur occasionally (Orr, 1977, pp. 154-55). In this scheme, structured consultation of library reference sources, including indexes, falls into the formal and episodic categories. To the extent that researchers in scholarly communication pay attention to structured literature searching, they maintain that scholars do it as needed. The success of their research speaks for itself.

The purpose of this article is, first, to offer an integrated conceptualization of the principal findings of the two bodies of literature alluded to. The second purpose is to analyze these findings in the light of yet a third body of literature, one which has sought empirically to interpret the effectiveness of information retrieval from indexing/abstracting systems and databases. From this analysis, it is hoped that one can draw some conclusions about the usefulness of library instruction for university faculty.

One precautionary note. The scope of this discussion is so limited and the body of literature that could be cited so vast that there can be no pretense of comprehensiveness. Since it is impossible in this limited space to do justice to the many nuances the literature reveals,
it has been necessary, as in all research, to exercise creative judgment in selecting the literature to be cited while synthesizing at a crude level the essential points that contribute to the argument.

**Science Researchers**

By the late 1970s it was possible to report more than a thousand studies of user behavior and use of information systems carried out during the previous thirty years. The majority dealt with scientists and engineers. A dominant theme that has emerged in these studies is the occasional use of abstracting and indexing systems (Ford, 1977, p. 29). Styvendaele (1977) found that scientists and engineers at the University of Antwerp identified only 15.5 percent of their periodical citations through formal bibliographic tools, a figure consistent with a number of previous studies he cited.

More recently, Rowland (1982) reported the results of a three-year study concluded during the previous year among academic and industrial scientists in Britain. He found that the principal method of maintaining current awareness was the physical scanning of current journals. In undertaking retrospective retrieval, the main technique was footnote tracing from current literature followed by footnote tracing from a review article. Though scientists considered the abstracting journals important and were unenthusiastic about eliminating them in favor of online access only, they did not report regular consultation of them. Of those 581 scientists responding, 297 indicated that they used them once a month or less or not at all. Only seventy-eight reported weekly use. Though the scientists were favorably disposed toward online retrieval, only 223 reported ever having had a search done while 365 had not.

The rise of online access has caused many to assume that it would ultimately revolutionize the way scientists and other researchers go about doing their work. An early study (Knightly, 1979) designed to see if computer searching was replacing the use of other techniques of information gathering concluded that it was not. Online was used as an occasional supplementary approach to more traditional techniques. A more elaborate study by Bayer and Jahoda (1981) of 262 industrial scientists and 70 university chemists loaded the dice in favor of online retrieval by providing unlimited free access to a search service for a year. The authors learned that use of the service did not diminish the total amount of time devoted to information-gathering activities and did not cause scientists to discontinue more traditional approaches. They found no significant impact on "continuing use of traditional information retrieval strategies" (p. 328). Pre- and post-tests revealed that the more frequent users of the
service even ended up significantly increasing "their assessment of the utility of scanning primary sources and use of citations from other works" (p. 329).

Borgman, Case, and Ingebretsen (1985) conducted a survey with only a 19 percent response rate on faculty use of database searching in six departments at ten universities. Of this sample, 41 percent reported never having a database search done. The commonest response to a frequency question on online searching was once a year, with only a quarter of the sample reporting use more frequent than three times a year (pp. 311-13).

More recently, Horner and Thirlwall (1988) reported on a survey of faculty at the University of Manitoba designed to ascertain their use of both mediated and personal searching. Among scientists and engineers, only 7 percent reported having a search done for them many times. Another 31.9 percent reported occasional use, 24.3 percent reported rare use, and 36.8 percent indicated no use at all. The comparable figures for personal searching were, respectively, 5.8, 12, 13.5, and 68.7 percent. This survey is especially valuable because it demonstrates that exploitation of end-user systems is not a reason for the occasional use of mediated systems.

Bichteler (1986) made an effort to identify geoscientists who were doing their own searching since a number of studies reveal relatively occasional use of mediated services by geoscientists and even a somewhat negative attitude about the overall value of computer retrieved bibliographies. Her national search tracked down only a small number of end-users, many of whom were practitioners rather than academicians. They typically did five to ten searches a year, many of which were author searches, rarely consulted a thesaurus or other documentation, and seldom did large retrospective searches (pp. 46-48). Torok and Hurych (1986) surveyed science, social science, and humanities faculty in twenty universities in an effort to determine level of interest in end-user searching. Though expressed interest was high, only 33 percent reported wanting as many as three searches a year (p. 337). These figures bespeak both a low level of demand for online retrieval and a limited market for end-users, especially adept ones.

A judicious assessment of the impact of online retrieval on the conduct of scientific research is given by Orr, who noted that scientists seldom request more than one or two searches a year even where they have unlimited free access to search services, "as numerous systems designers have learned to their dismay when the computer search systems they installed were utilized to only a fraction of design capacity" (p. 160). Once the novelty has worn off, Orr concluded, scientists tend to use the system only for essential needs.
The literature generated by students of scholarly communication in the sciences has, as might be surmised, come to similar conclusions about the sporadic use of formal bibliographic retrieval systems, whether print or online, by scientific researchers. Two excellent and well documented summaries are the works edited by Nelson and Pollock (1970) and Garvey (1979). The main thrust of these studies has been to identify both informal and formal information retrieval channels among scientists, with the former predominating. The much mentioned "invisible college" (Paisley, 1965; Crane, 1972; Cronin, 1982; Chubin, 1983) is a reality, though there appear to be many of them at any one time, depending on the discipline, subdiscipline, and nature of the area being researched. Some research fronts have strong invisible colleges; others have nearly nonexistent ones. They are somewhat evanescent in character. Still they provide a mechanism through which scientists in a specialized area of research may carry on routine communication through personal contacts at conferences and symposia, and the exchange of conference papers, technical reports, preprints, and reprints that precede the appearance of the reported research results in a refereed journal. Though librarians have tended to think of the journal article as "new" and its appearance in abstracting journals or reviews of research as "old," for large numbers of scientific researchers the journal article itself is old.

The more important scientists in a field have particularly well developed informal communication networks. They are the people who obtain large grants, invite others to share research projects with them, serve as officers on important scholarly organizations and as editors of leading journals, referee grant proposals and journal manuscripts, organize symposia, select students for admission to graduate school, write recommendations for other people's research proposals, and so on (Garvey, 1979, p. 12). In this way, they are strategically situated to keep current on research being carried on by many researchers in their fields. It is worth noting, too, that a small number of individuals account for a high percentage of published research in the scientific fields. Griffith and Miller (1970) state that younger researchers, who are not yet established, seem to make more use of structured communication channels primarily because they are still outside the informal networks (pp. 134-35).

These informal channels, as Garvey (1970) points out, satisfy a number of psychological and practical needs for scientific researchers. They offer an opportunity prior to publication to work flexibly on the project, to present the results tentatively so as to reshape it based on feedback from others, to obtain reinforcement from (and commiserate with) kindred spirits, particularly if one is part of a network seeking to challenge a current orthodoxy, to establish
hitherto nonexistent but potentially valuable contacts with important researchers, and to control those with whom one exchanges information (pp. 143-45, 153-56).

**Social Science Researchers**

The discipline of psychology serves as the bridge between the sciences and the social sciences, evincing characteristics of both areas. One of the major studies of scientific communication, carried out by the American Psychological Association (APA, 1963, 1965, 1969), is frequently cited in both science and social science communications research. Though there had been isolated studies by librarians and others of the information-seeking behavior of social scientists in other disciplines, the first and only large-scale study was that undertaken at Bath University in the late 1960s under the direction of Maurice Line (*Information Requirements*, 1971). Useful syntheses of the principal findings can be found in Line (1971), Evans (1974), Morrison (1979), Stoan (1986), and Slater (1988).

In broad outline, social scientists rely heavily on citations identified in book and journal literature, on recommendations from colleagues, on personal collections and bibliographic files, and, in the more book-oriented disciplines, on browsing. Their overall use of indexing systems may be lower than that of scientists. These findings have been corroborated by smaller studies conducted by Wood and Bower (1969), Styvendaele (1977), Stenstrom and McBride (1979, 1982), and Stieg (1981). More recently, Folster (1989) studied faculty in four social science departments finding once again that reading journals in their own field, tracing references, consulting personal collections, consulting colleagues, scanning journals in other fields, and attending conferences all ranked above use of abstracts or indexes as techniques of information gathering. Use of online searching ranked at the bottom. Thaxton (1985) found in a study of faculty and graduate students in psychology at Georgia State that informal communication patterns were indeed strong and that formal use of access tools was modest. Students who had attended instructional sessions offered by the librarians did not differ in their behavior from those who had not.

Horner and Thirlwall's (1988) study at the University of Manitoba revealed that only 8.8 percent of social science faculty reported using mediated online searching many times, 29.9 percent occasionally, 22.4 percent rarely, and 39 percent never. Comparable figures for personal searching were, respectively, 6.9, 15.1, 14.2, and 64.8 percent. These rates of use were almost identical to those of scientists and engineers. Garvey, Lin, and Nelson (1970) generalize that the informal
communication channels described earlier for the sciences exist also in the social sciences, but that they are generally less tightly structured, more unpredictable, and work more slowly (p. 297).

The sporadic use of indexes by social scientists has been traced to a number of factors. Indexing systems in the social sciences are numerous, small, cover limited numbers of journals, often selectively, fail to include book literature, which is heavily used by most social scientists, and encounter major problems in terminological control, which is in no way resolved by keyword access (Evans, 1974; Stoan, 1986, pp. 10-11). Moreover, indexing tools in the social sciences cannot compensate for the very powerful eclecticism and multidisciplinary use of materials evinced by most of the social sciences (Earle & Vickery, 1969; Broadus, 1971; Line & Roberts, 1976; Brittain, 1979; Line, 1971, 1980, 1981). Lastly, social scientists often rely for primary data on a wide variety of materials such as collections of printed documents, archival materials, statistics, government publications, polling results, memoirs, speeches, autobiographies, newspapers, eyewitness accounts, etc., that are not indexed as social science literature per se and require a great deal of creative ingenuity on the part of the researcher to conceptualize as significant and then track down.

**Humanities Researchers**

For the most part, there is less empirical evidence about how humanists work than about other scholars. The most systematic studies have emerged from the Centre for Research on User Studies in Sheffield, England, which set out to do for humanist research what Bath did for social science research. An early study reported by Corkill (1978) involved a mail survey to professors and graduate students in English, French, history, music, and philosophy at thirty-five universities in the United Kingdom. The 612 responses from faculty represented a 64.4 percent response rate. Corkill reported that humanists used personal collections heavily, generally consulted a very broad range of materials, many of which were quite old, made heavy use of book literature, consulted a great deal with other scholars, did little delegation of information retrieval, did the basic research work alone, and relied on libraries heavily for much of the material used (pp. 55-58). In terms of information-seeking techniques, more than 90 percent reported using publishers' catalogs and inspection copies of books, scanning current journals, following the library's accession lists, and maintaining informal contacts with colleagues and other researchers. More than 80 percent obtained information at conferences and through subscriptions to key journals in their fields. Only 21.6 percent used bibliographies or abstracting/indexing systems (p. 84).
Stone (1982) added the following points about humanist scholars. They seldom collaborate but do consult with others a great deal, browse very heavily in the stacks since they are often not seeking anything specific, utilize a variety of research methods and materials, only occasionally consult secondary services, which, as in the social sciences, index only journal literature, emphasize personal opinion and interpretation very heavily, and work best in an open stack arrangement with a large monograph collection arranged by subject classification.

Weintraub (1980), Garfield (1980), Broadbent (1986), Fabian (1986), and Wiberley and Jones (1989) have corroborated this general picture, emphasizing the lack of an identifiable "research front" or cumulativeness in humanities research. Humanities literature could perhaps be better described as aggregative rather than cumulative, for one can still reinterpret Plato the same as Alfred North Whitehead, or John Donne the same as James Baldwin. Older literature is continually consulted anew, and there is little compulsiveness about "current awareness" since any one interpretation can be considered as valid a contribution as another.

With regard to use of online retrieval systems, Horner and Thirlwall's (1988) indicative study at Manitoba found that 1.9 percent of humanities faculty used mediated search services many times. Only 9.4 percent used such services occasionally, 13.2 percent rarely, and 75.5 percent never. Comparable figures for personal searching were 5.7 percent, 9.5 percent, 11.4 percent, and 73.3 percent. These figures are lower than for the sciences and social sciences and indicate that databases that search only journal literature, and go back only a decade or so, are of limited use to scholars who rely heavily on books that may go back many decades.

A very critical aspect of humanities research, also valid for much social science research, is the unique nature of the monograph and even the journal article. Whereas in the sciences a journal article reports the results of one's research, in the humanities and social sciences a monograph or journal article is the result of one's research.1

Wilson (1980) summarizes this with his accustomed insights, using historians as an example:

historians accumulate bodies of fact and also accumulate competing explanations and interpretations of the facts without apparent limit. The historian's results are not conclusions which can be stated briefly and impersonally and recorded in a reference book of historical findings. The monograph the historian writes does not simply present his results; it is itself the result. It is a piece of art, of high or low quality, and the art cannot be factored out. (p. 12)
Farther on, Wilson notes that syntheses or abstracts of social science (and humanities) literature are unsatisfactory substitutes for the originals. "To know what social scientists have done, one has to read their works, for their works are what they have done" (p. 18).

This view of the monograph as a work of personal creativity, not unlike a musical composition or painting, causes humanists to be able to identify hundreds of scholars and the monographs they have written in much the way that a student of music can identify hundreds of musical compositions and a student of art hundreds of individual works of art. Though humanists often write articles—which may themselves become minor classics as works of unusual insight and influence—their articles are often only a way station on the road to a fuller exposition in monographic form; hence the greater emphasis on the monograph as offering the most comprehensive treatment of the scholar's fully developed ideas. This same statement can be made of social researchers, like political scientists, who work in book-oriented disciplines.

**Personal Collections and Library Collections**

Before leaving the discussion of what we presently know of how scientists, social scientists, and humanists work, it would be useful to include a few paragraphs on the development and use of personal collections. Soper's (1976) extensive survey of 178 faculty in the sciences, social sciences, and humanities revealed that 98 percent of them had personal collections of considerable size that existed regardless of the size of library they had access to. These collections included books, journal subscriptions, copies of papers delivered at conferences, photocopied articles, preprints, reprints, government publications, research reports, and so on. Essentially, researchers seek to build up a library of materials focused on their principal research interests and use the institutional library as a supplement for more expensive, rarer, less frequently needed, or more diffuse subject-oriented materials.

Soper (1976) determined that faculty tend to consult their own collections first, then those of their colleagues, then a departmental collection (if one exists), and lastly the institutional library. All surveyed faculty ranked the importance of their personal collections as first (humanities and social sciences) or first or second (sciences) in their research (pp. 397-401). Their primary reason for developing personal collections is the convenience of the immediate accessibility of much desired or frequently consulted items, since faculty see access to the library's materials as uncertain and inconvenient.

Soper (1976) also determined that, in their own research, faculty cite materials from their personal collections a great deal. The
scientists and social scientists she studied cited personally owned materials about 73-74 percent of the time. Humanists, more dependent on a huge and very diffuse monographic literature, cite their personal collections only 36 percent of the time (pp. 402-13). Since scholars set out to accumulate materials that bear most directly on their areas of specialized research interests, it is not surprising that their personal collections can assume such significance. It is also not surprising that these collections can provide access to a wealth of focused bibliographic information.

To point out the significance of personal collections in scholarly research in no way diminishes the importance of library resources, which all faculty report to be valuable for their research and teaching. The research library fills an indispensable role by acquiring and maintaining rarer, more expensive, and less commonly needed materials that serve as supplements in research and assist in maintaining general currency in the discipline for teaching purposes. "Insofar as the . . . library houses copies of information sources that figure in one's reserve supplies of information, to be consulted in case of need, the library provides a benefit that is independent of the actual frequency with which the sources are consulted" (Wilson, 1977, p. 85).

AN INTERPRETATION OF RESEARCH FINDINGS

In 1981, Wilson observed in an article on user studies that research in this area has suffered from concentrating on the "means by which people discover information (often analysed in terms of the information researcher's view of how the user ought to have been seeking information) rather than upon the ends served by the information-seeking behaviour" (p. 10). The result of this bias, Wilson observes, is dissatisfaction with the results of the studies, "since the service implications have been far from clear" (p. 10). One must seek to understand the psycho-social context of information seeking in order to understand what information a person wants, why he or she wants it, and what techniques she or he chooses for obtaining it. Though Wilson was describing all user study research, his trenchant observations certainly apply in the case of studies of scholars.

The picture that emerges from an examination of the literature on faculty information gathering can be conceptualized in several different ways. At the most basic level, it can simply be stated that informal techniques for keeping up with the literature and retrieving materials useful for research prove to be satisfactory to scholars. Hence their lack of concern about changing personal behaviors that for
them have been successful. To put it another way, researchers do not see a problem in terms of bibliographic retrieval and so are not seeking a solution.

At another level, one can note, as Orr (1970) has, that a good way to interpret researcher behavior is through holistic analysis of all options open to the researcher for retrieving bibliographies or other data. If the individual must allocate limited amounts of time and energy toward information seeking, and that information can be obtained satisfactorily in a number of different ways because of the considerable redundancy built into the system through the invisible college, direct consultation, personal collections and bibliographic files, references and footnotes, or bibliographies, indexes, and abstracts, researchers opt for those techniques that have the highest reward-cost ratio while offering the greatest psychological gratification by serving a number of needs simultaneously. In this situation, "their observed preference for informal channels is completely understandable" (p. 155). Orr also cites evidence that the strongest single predictor of publication productivity is the amount of informal contacts with other researchers (p. 168).

Yet another way of conceptualizing the approach used by scholars is to note that it emphasizes information-retrieval channels that offer guidance from other experts in their fields, whether in the form of informal communication through invisible colleges, consultation with colleagues, scanning newly published literature for current awareness purposes, or paying close attention to the literature cited by other scholars in their monographs or articles. In so doing, researchers are obtaining scholarly analysis and guidance from their peers, who provide the intellectual context indispensable for understanding research in the discipline. The numerous surveys showing that consultation with librarians ranks very low as a means of information retrieval for faculty are further evidence that librarians, not being viewed as experts in subject disciplines, are outside of the research loop in any fundamental sense.

The emphasis on information-retrieval techniques that link researchers directly to the ideas, interpretations, suggestions, comments, and views of their peers dovetails neatly with the sizable literature on the intellectual processes involved in research. These studies point to the powerful influence of creative insight and intuition that come only from a well instructed mind working continually with the subject matter of the discipline. They emphasize that, despite the popular conception of the "scientific method" learned in grade school, research is normally random, nonlinear, and nonsequential.
Since consulting the literature is but one dimension of a complex intellectual process of ongoing dialog with the subject content of the discipline as the research project germinates, evolves, matures, and bears fruit in the mind of a researcher, it is difficult to generalize where a structured literature search "fits," if at all, in the execution of any particular project in any particular discipline. Just as the intellectual processes involved in research are often random, exploitation of library materials is also random (Grover & Hale, 1988, p. 11). The evolution of the project in the mind of the researcher "dictates the sources sought out at each stage along the way. A new idea generated from one source, an original insight springing from another, may alter the direction of the quest and the kind of material being sought" (Stoan, 1984, p. 102).

The preceding observations suggest that there is a defensible logic in the information retrieval techniques used by scholarly researchers, who would accept them as self-evident on an experiential level. Still, these observations do not in and of themselves "prove" the superiority of informal approaches on an empirical level. Is it not possible, as many librarians suggest, that more routine consultation of the secondary services will improve the quality of research? In one sense, the answer to this question is immaterial. Since the faculty are part of an elaborate social system with its own rewards and punishments, they only respond to penalties imposed by their own peers—other researchers in their fields. Since librarians are not part of their social system, faculty are largely unconcerned with their perceptions.

In the interests of scholarly objectivity, however, it may be possible to quantify, in a backhanded way, at least one dimension of this problem. There have been a number of studies aimed at evaluating the effectiveness of information retrieval from bibliographic services, both print and online. These would give at least some indication of the likely usefulness of organized bibliographies to a researcher.

Three splendid articles by Swanson (1977, 1986a, 1986b,) should be considered essential reading by all librarians seeking to understand the intellectual difficulties inherent in all information retrieval. Though it is possible to present in synopsized form some of Swanson's major data and arguments, there is no adequate substitute for reading the originals.

An underlying theme in Swanson's articles is that there is a vast body of public knowledge contained in the written record whose retrieval is highly problematical and always incomplete because there is no satisfactory way of labeling (indexing) each document for purposes of retrieval for every possible use to which it might be put. Indexing terms merely indicate the main thrust of the article or book
as viewed from the perspective of the author. They can never account for other perspectives from which that document, or even a part of that document, might be used by other researchers working in essentially unrelated areas. Information contained in books or articles may be used in the future in ways as yet undreamed of in the present.

Indexing systems, essentially, cannot overcome the perspectival problem inherent in all retrieval. Since the only way to guarantee that no potentially useful, or relevant, information might be missed would be to examine the entire written record of the human race—an obvious impossibility—one must conclude that all information retrieval is essentially incomplete, "or, if it were complete, we could never know it. Information retrieval, therefore, is necessarily uncertain and forever open-ended" (Swanson, 1986a, p. 114). In doing bibliographic retrieval, we are looking for what we do not know and are never certain how much we have not found.

To illustrate with a purely hypothetical example, let us suppose that a historian is doing research on the Indian removal policy of Andrew Jackson. A standard literature search using the obvious indexing terms will only turn up documents whose main thrust is Jackson's Indian removal policy during the 1830s. It will not turn up an article on the agrarian economy of Alabama from 1820 to 1850, which contains a splendid, well documented two pages on the economic impact of Indian removal on this part of the South. It will not turn up an article on changing interpretations of the U.S. Constitution from 1801 to 1861 which may contain a fine page on the constitutional implications of Indian removal. It will not turn up the diary of a white settler who obtained land during this period. It will not turn up an autobiography of one who spent two years of his life surveying lands obtained from the Indians. It will not turn up a book on British foreign policy in the nineteenth century that may contain information on international reactions to Jackson's policy. It will not turn up a monograph on the history of antebellum Mississippi containing a chapter on Indian removal. It will not turn up a general history of the Cherokee people.

Though all of these other pieces of published literature would be useful, each has been indexed in ways that no bibliographic searcher could possibly have thought to include in a search strategy. Only the creative mind of a highly knowledgeable researcher drawing bits and pieces of data from a wide range of sources and obtaining leads through numerous channels would likely come across all of these items and weave them together into a unique work of scholarship. In the last analysis, it is the mind of the researcher that endows a document with "relevance" by conceiving a way in which it, or even a small part of it, fits into his/her emerging research scheme.
A descriptor assigned by another party promising that the “topic” of a document conforms to the general area of one’s own research does not guarantee relevance. Indeed, this is the heart of the information retrieval dilemma. Documents indexed under the obvious subject terms may prove to be irrelevant; documents indexed under subject terms one would never think to look under may prove to be relevant. As if this were not enough, the researcher must somewhere make an informed judgment that she must cease gathering data and commit ideas to paper, even though there may still be much unexploited data of whose existence she is unaware.

In bolstering his arguments on the inherent limitations of information retrieval systems, Swanson surveys four experiments effected in both manual and automated environments that demonstrate with ineluctable empirical evidence the inherent limitations of the topical “literature search.” In 1953, Documentation, Inc. and the Armed Services Technical Information Agency Reference Center challenged each other to a contest to test the relative effectiveness of their indexing systems. After teams from the two agencies had searched for bibliographic information on ninety-eight search requests from a pre-selected set of 15,000 documents held in common, they learned that one team had retrieved 2,220 documents and the other only 1,560. Most disturbing is that they had retrieved only 580 items in common. After reviewing the complete set jointly retrieved, the two teams could only agree on 1,390 items as being relevant to the ninety-eight search requests. They disagreed on 1,577 items (Swanson, 1986b, pp. 389-90).

The Aslib Cranfield Project in England carried out a series of information retrieval experiments in 1966 which, Swanson calculated, missed about 92 percent of the potentially relevant documents in the bibliographic base used. The MEDLARS test of 1967, which sought to test both precision and recall for the new automated system by comparing retrieval on 302 questions to a pre-identified list of relevant articles resulted in an average precision rate of 50 percent and an average recall rate of 58 percent. These figures, being averages, concealed the fact that precision and recall on any individual question searched fell almost uniformly anywhere on a scatter chart, making it impossible to make any predictive claims for the precision or recall rates of a computer search. Lastly, the SMART-MEDLARS comparison experiments, carried out in the late 1960s and early 1970s, were unable to demonstrate empirically that free-text searching was more successful than the already problematical controlled vocabulary searching in computerized literature retrieval (Swanson, 1977, pp. 131-36).
Vincent (1984), writing specifically of research in the humanities, also noted the limitations of access tools in helping a scholar capture a new insight or interpretation: "not only do indexes and computer databases continue to have limitations as pathfinders to scholarship," he wrote, "they are utterly incapable of placing an idea or concept into its proper context . . ." (p. 181).

More recently, Weinberg (1987) examined the issue of indexing in the online environment, coming to much the same conclusions as Swanson. She stressed that indexing terms relate only to the "aboutness" of a document, whereas scholars, seeking to solve problems or observe data in new ways, are interested in "aspect," an area in which indexing systems, even with free-text capabilities and abstracts, fail totally.

Truly striking evidence of the essential incompleteness and utter unpredictability of subject retrieval online has been supplied by Trivison, Chamis, Saracevic, and Kantor (1986). They obtained forty search questions, assembled a group of thirty-six experienced online searchers, and submitted each question to groups of five searchers based on areas of subject expertise. Each searcher then independently conducted an online search in a designated DIALOG database to guarantee complete comparability of retrieval results. The four organizers of the project also contributed searches. The nine bibliographies retrieved for each search question were merged into a "union of output" to be submitted to the requestor for evaluation as to relevance. This union of output was used as the base upon which to calculate the precision and recall ratios for each search run.

The results were striking. In preliminary results reported on five questions, the precision for the unions of output varied from less than 20 percent for one question to more than 90 percent for another. The numbers of relevant documents retrieved by individual searchers on the same question varied from one to twenty-seven on one question, nine to forty-one on another, one to forty-three on a third, zero to fifty on a fourth, and four to forty-four on a fifth. Recall by individual searchers was uniformly low. Only one searcher found more than half of the documents collectively identified by the group. Others ranged from 0.0 percent to 48.1 percent, with most falling under 30 percent. There was little overlap among searches on the same topic, and the search strategies and numbers of commands and search terms used varied widely.

The only conclusion one can come to based on these results is that one can legitimately make very few claims for online searching. Depending on the search problem and the searcher, results can vary widely. It would be rash to talk about an "exhaustive" or
"comprehensive" search. A searcher could make no promises with regard to an average level of either recall or precision. At best, one can only promise the patron to find something that might be a useful lead.

In a similar vein, the UK Scientific Documentation Centre, with funding support from the British Library, conducted a three year study in the mid 1980s of bibliographic retrieval in science and technology with a view to identifying the most effective techniques of information retrieval. The extensive study concluded that online searching was the least effective method of bibliographic retrieval, being systematically outperformed by print sources by a wide margin (Davison, et al., 1988).

There is certainly much evidence that bibliographic retrieval from secondary sources, whether print or online, is imprecise, tentative, inconclusive, and incomplete. The empirical studies are the more persuasive since nearly all of them have dealt not with social science and humanities literature, whose "soft" terminology makes retrieval more problematical, but with the sciences, whose terminology has supposedly been "harder" and more precise. The studies confirm what researchers have long observed at an experiential level—namely, that the best of bibliographies, indexes, and database searches are merely sometimes helpful supplements to other methods of bibliographic retrieval. As a practicing social scientist (Rush, 1974) in the United Kingdom put it, "not only is the computer severely handicapped, even helpless, when faced with terminological inexactitude, but so also is the bibliographer, the indexer and the abstractor" (p. 94).

INSTRUCTION FOR THE FACULTY

The conclusions to be drawn from the evidence presented are these. The faculty rely on a wide variety of information-retrieval techniques, many of them informal and most of them geared toward obtaining some kind of expert guidance from other scholars as part of the retrieval process. The nature of the research process is such that their need to carry out structured literature searches, whether in print or online, is occasional. Their experiences with bibliographic tools, including online ones, have evidently not been so positive as to convince them that more frequent exploitation of these sources would significantly benefit their research. Indeed, structured literature searches in print or online sources, using either assigned descriptors or free text capabilities, can be shown empirically to suffer from grave limitations in terms of precision and recall. Overall, faculty are generally satisfied with the way they are carrying on their research and doing literature retrieval for research purposes. Their behaviors
in this regard have been "successful." One result is that at least a generation of efforts on the part of librarians to reorient faculty behavior through education programs of some kind or another have changed nothing.

The Bath University researchers initially reacted to evidence of low or occasional use of bibliographic sources as indicating a need for expanded instruction. Evans (1974), a participant in the Bath investigations, later reported that the experiment of providing social researchers with an "information officer" to retrieve information for them was successful (pp. 85-86). But efforts to offer seminars on information seeking, library style, turned up only three volunteer participants (p. 90). Brittain (1985), also a Bath participant, reported, in surveying Bath findings, that expanded user education efforts failed to change researcher behavior. In grasping for some explanation for "user resistance" to more systematic exploitation of the access tools, Brittain could only surmise that lack of cumulativeness in social science research removed the penalties for poor work (pp. 266-70).

Such an explanation, of course, could be equally well applied to research in library science itself, where the lack of paradigms, theories, theses, conceptual frameworks, and cumulativeness has long been noted. As a matter of fact, if librarians are correct that frequent and systematic exploitation of secondary services is essential to good research, it would follow that research carried out by librarians should be superior to that of other scholars, assuming, of course, that librarians practice what they preach. It would be difficult to demonstrate, however, that research carried out by librarians is consistently better than research carried out in other fields. It would also be difficult to demonstrate that library researchers do better literature retrieval, however one might measure that, than researchers in other fields.

Where does this leave library instruction for faculty? The library should certainly undertake to offer training in such areas as the mechanics of retrieving from the online catalog or from CD-ROMs. It should seek to keep faculty informed of important reference sources and new reference acquisitions that may have particular usefulness to a department or to specific faculty members. It should also try to provide new acquisitions lists of materials acquired in the general collection. But the ultimate conclusion offered by the Bath University researchers in 1971 on user education for the faculty continues to be valid:

The information profession sometimes assumes that researchers want to, and can, work in a systematic way in dealing with bibliographical material and that the bibliographical system is about the only system, or at least the most important system, for the transfer of information. In view of the overwhelming evidence that social scientists do not perform
in this way, such assumptions (sometimes followed by exhortations) should be avoided. User education may go a long way to alerting researchers to potentially useful bibliographic tools and ways of using them; but it is doubtful if it could do more. (Information Requirements, 1971, p. 91)

NOTES
1. This unique dimension of the social science or humanities article compared to the science article helps explain a number of observed differences in the literature. Science articles, being essentially barebones descriptions of the results of a research project, are generally briefer and are produced in much greater profusion. Consequently, there are many more articles per issue, more issues per year, more journals in which to publish them, and the rejection rate is quite low. In the social sciences and humanities, by contrast, the reverse is true in each case.

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Bibliographic Instruction and Cognitive Authority

Patrick Wilson

ABSTRACT
A kind of advanced bibliographic instruction (BI) is proposed that involves the study of bodies of literature and their structures. The kind of study proposed would give students a basis for independent evaluation both of a body of literature and of the claims to cognitive authority of its producers.

Incoming college freshmen are asked about their goals: do they aspire to make a lot of money? to be an authority in their fields? Most (77 percent in 1987) say that they aim to "become an authority in his or her field," in addition to "being very well-off financially" (75.6 percent) ("Fact File," 1988). It is an understandable ambition; in a society in which expert knowledge plays such a central role, to be an authority in one's field is to have one of the most valuable assets available, a fund of intellectual capital. One can understand much of scientific and scholarly life as being a competitive struggle for authority; to be the acknowledged chief authority in one's field is to occupy a commanding position. Authority is desirable; how does one get it? and, in particular, is there any way in which bibliographic instruction can play a role in getting it?

First, to avoid misunderstanding, there are two quite distinct sorts of authority (Wilson, 1983, pp. 13-35. Compare De George, 1976). One is cognitive or epistemic authority, the authority based on claims to special knowledge. The other is administrative or "performatory" authority, the authority one has by virtue of occupying a position...
that empowers one to command or sanction or forbid others to do things. Cognitive authorities are authorities on something—e.g., insects or Buddhist logic. Administrative or performatory authorities are not authorities on anything; rather, they are authorized to do or command or forbid something, as the judge, “by virtue of the authority vested in me,” is able to perform a legal marriage ceremony. We are only concerned with cognitive authority here.

Second, cognitive authority is a matter of social perception and recognition. It is not what you “really” know but what others think you know that gives you authority; you get cognitive authority by getting others to think you know things. You might be the world's greatest expert on a topic, but if no one recognizes you as having special knowledge on that topic, you are no authority. You can be an authority for just one or two people without being a generally recognized authority. You can be an authority for some people while others think you are a fraud or a crank. Or you might be a generally recognized authority, recognized by all (or almost all) those who have an opinion on the matter as really knowing what you're talking about.

Third, the scope of your authority may be narrow or wide: the field or area in which you are thought to be especially knowledgeable may be as wide as all physics or as narrow as the history of Corvallis, Oregon. And the degree of your authority can vary from slight to great. You have some authority if people are inclined to give your word more weight than they would give to “ordinary” people's on the same subject; you have great authority if people are inclined to take your word as final, as settling the question. Authority is a matter of more or less weight being given to what you say in a small or large field; but “the” authorities on a subject include only those of great or near-great authority.

Finally, the crucial question: what leads us to recognize a person as having authority? What leads us to suppose that a person really knows a lot about a topic? If we personally think we are knowledgeable about that topic, we can test the person, formally or informally—i.e., listen to what is said, and judge whether it reflects real knowledge or just pretense or bluster. In the academic world, we judge each other all the time, deciding that this person is “sound” on topic X, that person is a “light weight,” that other a crank, and that other one simply ignorant of the subject. But what about all those areas of knowledge that are outside our competence? I know nothing about Sogdian history; how can I tell who does? Unless I am completely gullible, I will not take the fact that a person claims to know all about Sogdian history as settling the matter; there has to be some better reason than that.
If we can't ourselves independently judge whether or not a person is knowledgeable about a topic, we have to rely generally on reputation; if the person is thought to know a lot, we may go along with the general opinion. One other person's opinion may be enough; if I trust my friend $A$, I may simply ask $A$ who can be trusted on topic $X$. But my friend $A$ may be going on reputation. Ultimately, reputation will be traced back to some people who claim to be able to evaluate knowledge claims directly—i.e., peers or people active in the same line of inquiry. If a person's peers all think the person is knowledgeable, that provides a basis for reputation that others are likely to accept. This is not always the case, of course; a person may get a reputation which peers think is undeserved, and people may remain quite unknown even when they are well thought of by their peers. But by and large the social rule seems to be that specialists are the primary judges of specialists, and reputation outside the specialist group depends on reputation inside the group. That is not the whole story, though, as will soon be demonstrated.

There is another basis for recognition of authority—performance. One may not be able to judge people's knowledge in the area of their claimed competence, but they may be able to do things that convince one that they have special knowledge. If the doctor cures an illness, if the scientist makes predictions that can be seen as being fulfilled, that will provide a good reason for thinking that they have whatever knowledge it takes to do what they do. The performance test is not always available and not always conclusive; successful predictions might have been sheer luck, remission of illness might have been spontaneous. But performance often persuades more than anything else could, other than being able to tell by personal "examination" that a person knows something. We will come back to this point.

Those college freshmen who are seeking personal cognitive authority in their fields are going to have to persuade "established" specialists that they have acquired specialized knowledge themselves; they are going to have to study hard, take advanced degrees, and do research of their own that can be evaluated by other specialists. Authority is a social phenomenon through and through. The hard work is necessary but not sufficient; everything depends on whether others come to think that "$X$ is a good person [or even, the person] to ask if you have questions about that topic."

One can acquire cognitive authority in ways other than the academic route, but we can ignore these and concentrate on the academic world. There is clearly a role, albeit a very modest one, for bibliographic instruction to play in helping students work toward their goal of becoming "an authority in their field." The more heavily
research in their field depends on library resources—rather than on experiment or observation or abstract thought—the more valuable will be knowledge of the bibliographic system. In some kinds of research, knowledge of the bibliographic system is practically indispensable, while in others one can get along with little or none. Naturally we want to help those who are interested in becoming "authorities in their field" by first persuading them that BI will in fact do them some good, but we must not exaggerate its utility.

There is, however, another kind of connection between bibliographic instruction and cognitive authority. To make it, one has to distinguish between two kinds of knowledge associated with a field of inquiry. A person can be known as one who "has a wide knowledge of the literature" of a field without being recognized, or wanting to be recognized, as an expert (or even competent) practitioner in the field. And conversely, in many fields a person can be an expert in the field without having an especially impressive knowledge of the literature of the field. One might be a good economist or theologian without especially impressive knowledge of the literature of economics or theology; one might know those literatures without being an especially good economist or theologian, or being one at all. The practitioners claim to be good at developing and using the techniques of a field to discover new things and to be uniquely good at telling what is right and what is wrong with others' work in the field. Practitioners' knowledge is know-how: how to conduct research in a particular field, how to evaluate others' work in the same field. One may lack, or disclaim having, a practitioner's know-how and yet have a lot of "know-that," knowledge of what the practitioners have produced in the way of writings. Experts in a field may generally be expected to have considerable amounts of both kinds of knowledge, but they are two distinguishable kinds.

If practitioners' knowledge is distinguishable from knowledge of "the literature," what kind of knowledge is knowledge of "the literature," and what good is it? Knowledge of "the literature" of a subject is, in the first place, knowledge of the separate pieces of literature—i.e., the works that make up the literature. It will probably not be knowledge of all the works in the field unless the field is a quite small one, but wide knowledge of a literature means at least wide acquaintance with the works in the field. What there is to know about the works making up a body of literature includes standard bibliographical information about publication, but this is of less importance than knowledge of works' content, intertextual relationships, and position in the intellectual field. One cannot come to know a literature without having read it and understood it, hence to have come to know its content to some degree. Deeper knowledge
of content includes not just "what the work says" but how it says it, and what it exemplifies or exhibits—that it is, say, an early application of a new technique or a prominent example of a certain intellectual style. Knowledge of intertextual relationships is knowledge of the other works in relation to which the particular work is to be understood and its significance identified. Knowledge of a work's position in the intellectual field is two-fold, depending on "stand" and on "standing"—i.e., on the "stand" taken with respect to a space of possible alternative stands or positions, and on its "social standing" in its field—crudely put, a matter of its reputation and influence.

This is knowledge of "the literature" representing scholarly or scientific production. It might be the literature of a discipline, or a subdiscipline, or a specialty within a subdiscipline, or of the study (perhaps cross-disciplinary) of a particular problem or phenomenon; there are countless ways of isolating bodies of literature for study. And of course there are other literatures of which one can have knowledge, for example, "real" literature, that is novels, poems, plays, and the like, or primary source materials for study in some area—i.e., archives, public records, private correspondence, survey data, census records, etc. For any area in which a body of literature is produced, we can expect to find (at least) two different kinds of cognitive authority—authority in the area, the kind of authority claimed by practitioners and producers of the literature, and authority on the literature produced, a kind that can be acquired without being a practitioner in the area at all.

Whatever the value of knowledge of the literature of a field may be for its possessor, its value to others is potentially enormous. I can ask a person who knows a body of literature well "Is there anything there that I should know about?" and hope that, once I have made it clear what my own interests and problems are, the other will be able to make connections between my situation and the literature of their field and steer me toward works that I might otherwise never have heard of. The crucial ability involved is the ability to see, or imagine, indirect or nonobvious relevances—i.e., the possible utility of works that have no obvious connection at all to my interests, which I would never have found by direct search because it would not have occurred to me to search for them. This ability, though marvelous, is not all that rare. Good librarians have it; graduate students may have it, helping faculty members by identifying potentially interesting material in regions unfamiliar to the faculty member. This is the kind of performance on which we are likely to base estimates of
the performer's knowledge: if they can produce such useful things, they must know something worth knowing. This is a typical road to recognition as a cognitive authority.

For our purposes, it is worth stressing that librarians, among others, can acquire a good knowledge of the literature of a field without taking an advanced degree in the field or otherwise acquiring a practitioner's know-how. Such knowledge will be used on behalf of clients, but might it not also be used in instruction as well? There is the familiar straightforward job of showing undergraduates how to use the bibliographic system for whatever use that may be in their studies, and the more specialized job of showing advanced students how to use the specialized bibliographical resources of a field. But might there not be a further kind of instruction to give, aimed not at helping people become practitioners in a field but rather at studying bodies of literature? If there is, what in fact might it be, and why should anyone want it?

If one knows a body of literature well, what one knows will include a very large amount of detailed particular knowledge, for example, about individual works and their characteristics. But that is not the kind of information that could be useful to attempt to pass on to others. One would not do it in bibliographic instruction of the usual kind, where the objective is to show students how to use the bibliographical apparatus for course-related purposes or in aid of research in a field. Those who want to use the literature simply as a tool in their own research will not want to know more than is necessary for what may be very narrow purposes, so that the successful teacher would be the one who was careful not to burden them with more than they wanted to know. The same would be true if one were trying to help students come to know a body of literature; most of one's detailed knowledge would not be worth trying to pass on to any except the few who were interested in that very same body of literature. But what could be the alternative?

The teacher must have something general to give; one's knowledge must support some interesting or useful generalizations, but what sort of generalizations? Might it take the form of a general theory of the structure, function, and growth of "bodies of literature" that could be taught to students seriously interested in mastery of some field of literature? Perhaps, but such a theory would first have to be invented. There is nothing of this sort yet available in the literature of bibliography or librarianship or information science. The nearest approach to such a theory seems to be Michel Foucault's *The Archaeology of Knowledge* (1972), a famous but abstract and difficult work that is hard to imagine serving as a textbook in an advanced BI course (compare, Dreyfus & Rabinow, 1982). In the
absence of a general theory, the appropriate level of generalization might be an account of structural and functional differences among various specific fields of inquiry—for instance, as has been suggested, “differences in the structures of the literatures in these areas [the humanities and the sciences], distinctive features of scholarship that characterize and shape these literatures, and distinctions between reference and access tools serving these disciplines” (Smalley & Plum, 1982, p. 136). The notion of paying close attention to the structure of a body of literature, and structural differences among different corpora, has immediate attractions (quite independent of the now outmoded approach of the Structuralist Movement). Structural description seems appropriately general and potentially useful and/or interesting.

What kinds of structure? A body of literature does not have just one structure, but exhibits multiple structures, depending on which of many different kinds of relationships one uses to define a structure. The subject matter divisions of a field give one kind of structure; the different genres or kinds of literature produced give another kind of structure. The division of the literature into “live” and “dead” gives another kind of structure. And yet other structures appear when one considers opposing methodological, theoretical, and ideological orientations. The division of a field into competing schools of thought or methodological camps is often the major division for insiders and outsiders alike. The social structure of the group of people who produce a body of literature may be reflected in the internal structure of that body of literature. Conflicts among groups consist of both social and bibliographical facts; so are “distances” among groups—communication and noncommunication, borrowing and lending. These are revealing facts of social and bibliographical structure. Such structures correspond to the “intellectual topography” of the field (Keresztesi, 1982), and identifying them is one of the most crucial elements in coming to grasp the character of a body of literature. If we are drawn to a structural approach to bodies of literature, it should be with the understanding that there are many structures to be discovered in any single body of literature.

The more potentially elaborate the study of structure becomes, the more preposterous it begins to seem to think of making it the focus of a course of bibliographic instruction. For while one might, without difficulty, find a few relatively superficial things to say about the structures of the literatures of various disciplines, serious knowledge of structure requires a depth of knowledge of the literature that no one can be expected to have except, at most, in a few limited fields. But think of using one's special knowledge of a limited field as an example from which lessons may be learned that will transfer,
by analogy at least, to other subject fields. Supposing that one is
talking to a group of students seriously interested in exploring
different bodies of literature, small or large. One can try to help
them by exhibiting the variety of types of structure that can be found.
One would not assume that all literatures exhibit the same kinds
of divisions; one would want students to look for ways in which
their own field of interest differed from the instructor's exemplar
field and from those of their fellow students. But concrete illustrations
are always better than unadorned abstract description, and the simple
fact of having a particular "model" field subjected to structural
analysis would be a promising way of helping students execute their
own analyses.

How does one explore such structures? As it happens,
how does one explore such structures? As it happens,
bibliography is a natural tool for this purpose, and one used not
merely to identify the separate works making up a body of literature
but to investigate the intellectual "topography" of that literature.
Since bibliographical works are systematically organized, their
organization can indicate something about the structure of the
literature. Subject classifications made by those managing the
bibliography of a discipline, for instance, can be expected to reflect
the discipline's current understanding of its own subject matter
structure, and changes in the classification will reflect structural
changes in the field. The simple size of classification sections shows
something about the relative importance of different specialties
within a field. When a bibliographical work does not directly show
structural features of a literature, it may still provide information
from which structure can be extracted, as a citation index allows
one to uncover the life span of different parts of a literature, explore
the relative standing of authors and individual works, and trace
patterns of "exports and imports" from field to field.

There are many specialized guides to the literature of different
subjects which could serve as "textbooks" for the serious student
in an advanced BI course. The instructor need not try to substitute
lectures for these texts, but rather illustrate the use of bibliographical
works in structural analysis, using the literature the instructor knows
best as an example. In addition, there are the many already published
writings describing structures of different literatures—the many
citation studies and bibliometric studies of bodies of literature, for
instance, as well as the many explicit discussions of the state of affairs
within disciplines, evaluations of progress and prospects, critical
analyses of whole schools, and histories of the development of
disciplines. Some of these explicitly analyze bodies of literature, some
are directed rather at doctrines and theories, procedures, results, and
methodological disputes instead of at bodies of literature exhibiting
those features. All could be usable by one trying to construct a map of the topography of a literature. And steering students toward such material would be an important job for the instructor, involving more conventional instruction in the use of still other bibliographical works as tools to locate literature about bodies of literature.

While bibliography seems naturally suited for use in the exploration of structures of literatures, it has its limits, which would have to be made explicit. For instance, one element that is generally lacking in standard abstracting and indexing services and current bibliographies (including library subject catalogs) is description of a work's orientation or point of view or methodological position. From an indexing point of view it is noteworthy that the MLA international bibliography (sometimes) indicates the “scholarly approach” of a work—e.g., “Marxist approach, archetypal approach.” It is noteworthy because it is not standard practice in all the fields in which such discriminations could be made; in other fields, bibliography may offer no direct picture of the methodological or ideological spectrum of the field. And there are numerous interesting bodies of literature that can hardly be approached through existing bibliographical apparatus at all. The bibliographical approach to the study of structures of literatures is not always effective, but it is, we must suppose, always worth trying.

So it appears that there is an alternative approach in bibliographic instruction, aimed at the exploration of small or large bodies of literature, guided by a central concern for structural analysis. But what could be the good of such instruction? Who would want it? How could it substitute for a course taught by an expert practitioner of the field? And what's it got to do with cognitive authority? A BI course would not be enough to make one an authority on any substantial body of literature—that takes time. And, in any case, that kind of authority is not the kind that students say they want; they want to be authorities in some field, not on its literature or the literature of some other field. So the advantages of this alternative approach are not apparent—but aren't they?

First, not even the largest university offers courses on all subjects that have a distinguishable body of literature; “taking a course” is simply not an option in most cases. More importantly, the idea that the only, or the best, way to study a subject is to “take a course taught by an expert practitioner of the field” is one that we have been trying to subvert. Practitioners of a field claim two kinds of special competence, as we have seen: (1) at using their field's techniques, and (2) at evaluating work in their field. Let us concentrate on the second point—evaluation. Practitioners will claim that only practitioners can evaluate, or “properly” evaluate, work in their field;
but why accept this? Others may evaluate their work in different ways than they do, but where is the justification for claiming that the others will be wrong when they differ from the practitioners’ evaluations? Practitioners may be uninterested in outsiders’ evaluations of their work, but the “social rule” mentioned earlier, that specialists are the primary judges of specialists, is not a social law that outsiders are not permitted to form their own evaluations of the specialists’ work. Are we to exclude in advance the possibility that the practitioners’ evaluations of their own work are mistaken, that they grossly exaggerate their success in acquiring new knowledge, that they are more like alchemists than like chemists? Practitioners may have their own ways of evaluating their own work, but there have to be other ways, and there are.

We must insist that the kind of study of bodies of literature sketched earlier is just the kind of study that puts one in a position to make a personal assessment of the literature and of the status of the producers of the literature as well. Evaluation is to be distrusted when it is uninformed; “serious” criticism and evaluation is informed criticism and evaluation. Evaluation based on close study of a body of literature is certainly informed evaluation. Knowledge of the content of the works constituting the literature, of their intertextual relations, and of their position in the intellectual field is as clearly relevant to evaluation as any kind of knowledge could be. Evaluation of a piece of the literature is clearly better when the particular work is seen in relation to the other works in the field; attempts at evaluation of a work in isolation are generally pointless. Seeing a work as part of a structured field is seeing it in an appropriate context for informed evaluation. Seeing a structured body of literature as a whole is also a prerequisite for informed evaluation of the whole literature. The result of such an evaluation may, in fact, be the conclusion that those practitioners have nothing of value to offer, and that their insider’s evaluations are entirely untrustworthy (for a good example of this, consider the literary critic Frederick Crews’s [1986] critique of psychoanalysis). Practitioners’ knowledge and knowledge of a body of literature are not only distinct, they can also be competing bases for evaluation of a field of inquiry and its products.

So bibliographic instruction of the kind proposed would give students a basis for independent evaluation both of a body of literature and of the status of “authorities in the field,” not by teaching students “how to evaluate” but by helping to put them in a position to make their own informed judgments of others’ claims to knowledge. Those judgments might be extremely tentative, but that would be appropriate; one never knows all there is to know that is relevant to evaluation, and evaluations must always be subject to revision.
But they must start somewhere, and independent examination of a body of literature is a suitable starting place. The idea that bibliographic instruction should make the student to some degree an independent agent is familiar; here the idea is extended, from independent ability to find information, to independent ability to evaluate what one finds. Others may come to recognize the value of one's knowledge and one's evaluations, and one might thus get some recognition as (to some degree, for some people) an authority on a body of literature. But this kind of cognitive authority is unlikely to be one's direct goal; if it comes, it comes as an unsought byproduct of knowledge acquired for other reasons. Still, it is of interest to realize that bibliographic instruction, perhaps only a small aid in the quest for status as an "authority in one's field," can have quite another use—i.e., helping to put one in a position to be an independent assessor of others' claims to cognitive authority.

Now this looks remarkably like a central component of a general education aimed at increasing "students' awareness of the products and processes of culture" and at developing "critical and independent thinking in preparation for lifelong self-directed learning," as Frances Hopkins (1983, p. 20) described the aims of a second kind of bibliographic instruction—BI as a liberal art. In fact, what more generally applicable kind of study could one imagine? The kind of BI proposed here looks like a proper component of a liberal arts curriculum. If specialized professional education is the route to "authority in one's field," a liberal education should prepare one to question for oneself the status of the socially recognized authorities, rather than accept the status quo as given and unchallengeable. And the independent study of bodies of literature looks like a fine way of doing just that.

REFERENCES

Formulation Rules for Posing Good Subject Questions: Empowerment for the End-User

DONNA RUBENS

ABSTRACT
LACKING AN UNDERSTANDING of bibliographic organization and information retrieval systems, end-users have difficulty expressing an information need. By starting with the end-user's intuitive understanding of knowledge creation and the institutional structure, end-users can be taught a technique for analyzing their questions and translating them into information system terms. Based on a model developed to describe how professional searchers think, the question formulation technique employs five operations that transform a question into a description of the characteristics of potential answer-providing sources.

INTRODUCTION
This article provides rules for formulating subject questions that can be taught to end-users. The method is based on a model developed over the six-year period from 1982 to 1988. The model, called “thinking like a searcher,” was developed originally to explain how the professional searcher uses mental associations to develop a search strategy (Rubens, 1989). In this article, the results are applied to end-user searching (manual and online).

The question formulation process proposed here challenges the traditional relationship between the end-user and the professional intermediary by advocating a more active role for the end-user in the reference transaction. Rather than relying on the professional intermediary to draw out from the end-user what is really wanted
and to translate the question into information system terms, the end-user learns how to analyze his or her need for information and to specify the characteristics of potential answer-providing sources. The process is one that can be taught because it is based on what the end-user already knows about information sources.

The rationale for this project grows from the observation that many information seekers have difficulty asking subject questions. As Ingwersen (1984) noted, present IR (information retrieval) systems, whether printed or computerized, are based on the "best match" principle:

"Best match" implies the assumptions that users are able to specify the information required—that the information need expressions are functionally equivalent to document texts; i.e., equivalent to information. Optimistically, it implies that user queries exactly mirror the underlying problem situation, that users may describe very well what they might not know about and that the applied search terms are always valid. .... (p. 86)

As Ingwersen implied, the difficulties that end-users face stem from their lack of understanding of the structure of the information environment (terms used in a particular way in this article are defined in the appendix). They have no model of information flow, no knowledge of the bibliographic chain, no knowledge of subject relationships or of knowledge creation. This study suggests that end-users who hold an accurate and detailed view of the information environment are able to pose a question that takes into account the variables in that environment.

As opposed to the usual halting attempts to get help at the reference desk, asking a question and getting an answer require consumer behavior. When seeking a product, the consumer asks for certain features using appropriate language. When buying a computer, the consumer might specify a 32-bit memory board upgradable to 13 MB; a 20 MHz, 383 processor; two serial ports; and the like. Similarly, when seeking an answer to a question, the end-user might get a better answer if able to specify the features desired in terms of format, currency, intellectual level, and subject.

Information specialists have an extensive vocabulary for describing information sources. They use this knowledge to negotiate questions and to develop search strategies. For example, during the reference process, it is useful to distinguish research journals from trade magazines and consumer magazines, or to distinguish encyclopedias from handbooks and monographs, or children's books from adult fiction, and fiction from nonfiction. Professionals recognize thousands of subject fields and topics using technical and nontechnical terms derived from all sectors of society including academia and the popular press. In addition, they use an extensive
vocabulary for describing the characteristics or attributes of each type of source. Periodicals tend to be current or contemporaneous media. Children's books tend to have illustrations, larger print, and easy vocabulary. Handbooks tend to have tables and numbers describing properties or formulas.

However, this knowledge about classes and attributes of information sources is not systematically applied to the reference process or to bibliographic instruction. There is such a thing as "thinking like a searcher" (Huston, 1988), but there are no accepted models that are used for teaching reference or library use. This article describes one such model and applies the findings to teaching students how to formulate subject questions.

METHODOLOGY

The model here is based on ideas from the library and information science literature; the author's own experience working at the reference desk at a special, public, and academic library; and on an analysis of published case studies of reference.

Literature Review

The literature review for this study covered the years 1950 to early 1990 and included the topics of search strategy, the reference process, education for librarianship, bibliographic instruction, and expert systems for reference. The literature was scanned for studies of cognitive behavior. What does it mean to think like a searcher? What are the important variables in creating a search strategy? How does the question formulation influence the search strategy? How does the question negotiation influence the search strategy?

Although there was scant attention given to the cognitive aspects of these subjects, some ideas and studies proved useful. Benson and Mahoney's (1975) outline of query parameters made clear that a question has many dimensions beyond the topic itself (p. 318). The requestor typically makes only some of these parameters explicit when first posing the question. As Taylor (1968) discussed in his landmark paper, each of the other relevant parameters are identified through a question negotiation process. Benson and Mahoney also contributed the useful image of bridge building to describe the process of closing the gap between the query and the information system (p. 317). This image motivated this author's search for that bridge and resulted in the idea that "attributes" of information sources are the cognitive link between query and answers.

Neill (1975) argued that questions should be analyzed at a high level of abstraction (p. 313). Although a search strategy is ultimately expressed in character strings of specific terms, the initial stages of
query analysis require conceptualizations of the topic that explore the meaning behind the question as posed. This process allows for more flexibility in positioning the question in one or more subject domains and facilitates the creative approach to searching that Bates (1979a, 1979b) explored in her two-part series on search tactics.

It is generally agreed that knowledge of the system is necessary before the system can be interrogated and that end-users typically lack such knowledge. Ingwersen (1984) stressed that "the searcher must possess sufficient 'IR (information retrieval) knowledge' " (p. 471). He divided searchers into four categories depending on subject knowledge and system knowledge. The "end-user" and the "layman" are defined as groups having scarce or no system knowledge and therefore are dependent on a professional intermediary (p. 473). Current theories of bibliographic instruction suggest that users can learn the structure of information systems if they have a conceptual understanding of the search environment. Borgman (1982) showed that use of mental models improves end-user searching.

The literature on knowledge creation and information flow contributed terms for categorizing information sources and mapping the information environment. For example, the Doyle-Grimes Model of the Bibliographic Chain defines the relationships between primary, secondary, and tertiary sources as a function of knowledge creation and information flow (Doyle & Grimes, 1976, p. 3). Kerezstesi (1982) showed the importance of understanding information flow for bibliographic instruction and presented his analysis of the evolution of research information in the domain of academia (pp. 15, 17, 19). Swift, Winn, and Bramer (1979) went beyond the narrow domain of academia to explore the origins of information from a sociological viewpoint. The authors articulated the relationship between the institutional structure of society and the structure of the information environment. They pointed out that "knowledge is created as human beings interact....Interactions of people give rise to the institutional order." The authors concluded that it is useful in designing information systems to understand "how society works" (p. 218).

For example, governmental bodies produce official or public documents, and this is reflected in the institution we call depository libraries. Similarly, community groups and associations produce practical, brief reports on various subjects in the form of pamphlets, and this is reflected in vertical file collections. Or, to express it another way, depository libraries and vertical file collections are acknowledged divisions of the information environment as we know it. Professional understanding of these collections stems from an understanding of knowledge creation, which implies a knowledge of social structure. What kind of information do we associate with Congress, or the
courts, or travel writers, or publishers, or industrial labs? How are these documents reflected in bibliographic organization? How can knowledge of information flow and knowledge creation be used in the reference process?

Studies of end-user searching tend to conclude that users have trouble selecting the appropriate subject domain during a search. For example, Allen (1990) found that only one patron in five used the most appropriate database available and one in five used the least appropriate database (p. 69). This suggests that users have trouble classifying questions in subject terms and matching these terms to the selected information system.

In a pilot study on course-integrated instruction funded by the National Endowment for the Humanities and the Council on Library Resources, Tiero and Lee (1983) concluded that there is a need to teach generic sources rather than titles (p. 291). Their observations reinforce the idea that information seekers can be more flexible if they think in categorical terms.

The advent of end-user searching has forced some rethinking of the role of the intermediary and with it some re-examination of how far the end-user can go before the intermediary must intervene. Most models of the search process assume that interaction between the end-user and the intermediary is required to develop the interface language that bridges the gap between query and answer-providing sources. However, those researchers and educators whose instruction is motivated by the social ideology that information is power emphasize that users know more about information seeking and the information environment than they are given credit for. The bridge to an understanding of bibliographic organization is the user's intuitive knowledge of community information and social structure:

Teaching about information access, then, can best be achieved by first emphasizing the familiar (students' experiential and topical information) and then linking that to the new (librarians' bibliographic knowledge). To maximize communication requires our rethinking our approach to both students and faculty. (Huston, 1983, p. 186)

Analysis of Case Studies of Reference

For analysis of the reference process, fifteen published case studies of reference by British librarian Denis Grogan (1967, 1972) were examined. Grogan's two-volume work is unique in that each case contains descriptions of his reasoning and decision-making steps (see Figure 1). Each case starts with a description of the question as Grogan understood it. The running commentary of what he thought as he proceeded allows us to see his mind at work. It might have been valuable to have a transcript of the reference transaction, but from the way Grogan analyzed the question it can be concluded that a
good strategy depends on an analysis that translates the question into system terms. Underlying this analysis is a mental map of the information environment that supports the process of thinking like a searcher.

"What turned out to be a very long hunt for the date of the first use of the SOS distress signal was initiated by a national newspaper wishing to confirm the impression given in a film shown on television that it was by the sinking Titanic. Several approaches immediately suggested themselves to the librarian: the DATE, 14th/15th April 1912, was easily ascertained from the nearest ENCYCLOPEDIA, thus opening up access to the NEWSPAPER and PERIODICAL press of the day. Since a HUGE DISASTER was almost certain to have led to an OFFICIAL ENQUIRY, a 'FORM' APPROACH through the PARLIAMENTARY PAPERS would be another possibility; it was known that the film was based on Walter Lord's BOOK A Night To Remember (1956) and an approach that way seemed hopeful; even the SUBJECT APPROACH revealed several promising aspects--RADIO, SHIPPING, DISASTERS, etc...."


THINKING-LIKE-A-SEARCHER MODEL

The following is a description of the thinking-like-a-searcher model that outlines the searcher's knowledge base and how that knowledge is put to use during the course of a search. The section following the presentation of the model is the application of the model to question formulation and a discussion of requirements for teaching question formulation as part of a bibliographic instruction program.

A Good Answer Starts With a Well Thought Out Question

The literature of question negotiation, notably Taylor's (1968) paper, makes clear that a question as originally posed by the patron typically contains insufficient information to proceed with a search. The searcher must discuss the question as asked until certain critical information is made explicit. Benson and Maloney (1975) identified nine query parameters (p. 318). Figure 2 is based on their list. Each of these parameters helps channel the question to the appropriate source in or out of the library.
TOPIC PARAMETERS

1. Subjects and subject relationships
2. Time frame (current/historical)
3. Geographic scope

PROJECT PARAMETERS

4. Purpose (expected use for the information)
5. Scope (amount of material desired))
6. Depth, breadth, technical level
7. Language comprehension (foreign language fluency)
8. Literacy level
9. Media
10. Deadline


A Well Thought Out Question Starts With an Understanding of Documents and Bibliographic Organization

Searchers understand that the question must be translated into the language of the information system in order for an answer to be forthcoming. This requirement is often described as bridging the gap between question and answer (Benson & Maloney, 1975, p. 318). The job of the information seeker, then, is to analyze and classify the question in terms that can relate to documents and bibliographic organization.

Understanding Documents and Bibliographic Organization is Complemented by Understanding the Origin of Information

Information arises as a result of people at work in different settings. Because people have different interests and work within organizations and institutions with different responsibilities, focus, or jurisdiction, the information that arises is about many different subjects. Some information comes about voluntarily. For example, writers pick a subject they are interested in for the purpose of writing a book or magazine article. Researchers choose a topic and, according to traditions of scientific communication, they report their findings in a journal article, conference paper, or technical report. Some
information arises because of reporting or communication requirements, such as government statistics and Congressional testimony. Dissertations are written because of academic requirements for the doctoral degree. Tradition, economics, technology, and market factors dictate that information about many different subjects gets published, packaged, and distributed in certain predictable formats.

The library world recognizes these characteristic differences and accommodates them through arrangement and classification. Academic and special libraries collect and organize reports of scientific, technical, and academic research. These libraries typically segregate this literature into one or more journal collections. Public libraries specialize in consumer, trade, and popular literatures, which get into many separate collections depending on format, content, and audience. Fiction collections reflect the publishing patterns of trade publishers and journal collections reflect the publishing patterns of professional and learned societies and commercial academic publishers. In other words, bibliographic organization (libraries, collections, subject departments, subject headings, and classification) reflects the evolution of information within the social structure.

To the extent that information professionals understand the jurisdiction of government, or the habits of trade publishers, or the activities of citizen groups, they will understand what is in library collections. And if the information is not in their collections, they will anticipate that it exists and be able to guess where it might be located.

**Information Professionals Have a Two-Part Mental Map of the Information Environment**

The searcher mentally organizes the information environment into two complementary categories of answer providing sources—one that reflects the institutional structure of society, and one that reflects bibliographic organization (see Figure 3). The institutional structure is the set of institutions, organizations, and professions from which knowledge arises, hence the term *prebibliographic terrain*. The bibliographic structure is the set of form and subject divisions that characterize collections in each type of library, hence the term *bibliographic terrain*.

On the prebibliographic terrain, the searcher encodes information about key institutions and professions, notably academia; government
Figure 3. The Searcher's Two-Part, Dual-Context Knowledge Base. The searcher encodes knowledge of the structure of the information environment, including knowledge of the major divisions of the institutional structure through which knowledge arises, and knowledge of the major divisions of the bibliographic organization.

agencies; Congress and the courts; industrial, university, and government laboratories; religious groups; trade and professional associations; corporations; small presses; commercial and scientific publishers; news organizations; and free-lance writers, reporters, and consultants. For each institution or category of institutions, there is an associated set of terms, or "attributes," by which the searcher characterizes each source in terms of jurisdiction, purpose, or subject domain. For example, the attributes of government include "public," "official," "regulatory," "taxes," "statistics," "health," "welfare," "education," "environment," and so forth (see Figure 4). The number, scope, and choice of terms will depend on the searcher's familiarity with the institution and the professional demands dictated by the library setting in which he/she works. The choice of terms may be both idiosyncratic, based on what the searcher learns through experience, general education, and the news media; and standardized based on professional education and experience with subject headings and thesauri.
### Figure 4. The Searcher's Knowledge Base: Prebibliographic Divisions of the Information Environment.

The searcher characterizes institutional sources in terms of jurisdiction, subject domain, purpose, and scope of activities. The searcher classifies the query in terms of these attributes in order to translate the query into system terms. Attributes are part of the interface language that bridges the gap between the query and search paths. Only selected attributes of major divisions of the prebibliographic terrain are shown for purposes of illustration. A comprehensive associative network with all divisions and a rich vocabulary of attributes has yet to be created and graphically displayed.

<table>
<thead>
<tr>
<th>DIVISIONS</th>
<th>PURPOSE, SCOPE</th>
<th>JURISDICTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACADEMIA</td>
<td>Research, scholarship</td>
<td>All disciplines, fields of knowledge</td>
</tr>
<tr>
<td>GOVERNMENT AGENCIES</td>
<td>Official, public inquiry, investigation, regulation</td>
<td>Taxes, welfare, educ., health, disasters, environment, trade</td>
</tr>
<tr>
<td>CONGRESS</td>
<td>Official, public inquiry, oversight, investigation, law-making</td>
<td>(Same as Gov't)</td>
</tr>
<tr>
<td>COURTS</td>
<td>Official, public ruling, investigations</td>
<td>Murder, theft, white collar crime, abortion, discrimination</td>
</tr>
<tr>
<td>SCIENTIFIC LABS</td>
<td>Basic, applied research, testing</td>
<td>Sci-tech advances all disciplines, industries</td>
</tr>
<tr>
<td>BUS., MKETING RESEARCH</td>
<td>Surveys, scanning of business, markets, politics, economy</td>
<td>All industries</td>
</tr>
<tr>
<td>TRADE/PROF. ASSOCIATIONS</td>
<td>Statistics, trends, surveys</td>
<td>All disciplines, industries</td>
</tr>
<tr>
<td>CORPORATIONS</td>
<td>Statistics, trends, surveys of products, services, markets</td>
<td>All industries</td>
</tr>
<tr>
<td>TRADE PUBLISHERS</td>
<td>Current, historical popular, general, useful info; fiction</td>
<td>Travel, crime, money, self-help, romance, consumerism, reference</td>
</tr>
<tr>
<td>SMALL PRESSES</td>
<td>Esoteric, specialized, literary, scholarly info., opinion, lit.</td>
<td>Politics, social issues, controversies</td>
</tr>
<tr>
<td>MEDIA</td>
<td>News, entertainment</td>
<td>Current internat'l, nat'l, local events, notices</td>
</tr>
<tr>
<td>RELIGIOUS GROUPS</td>
<td>Opinion, interpretation</td>
<td>Religion, welfare, social issues</td>
</tr>
</tbody>
</table>
Figure 5 summarizes the most important divisions of the bibliographic terrain along with associated attributes. Attributes characterize bibliographic divisions by subject, content, genre, audience, format, and currency. Functionally, each division of the information environment is a generic set of answer-providing sources or search path. Benson and Mahoney (1975) called these classes "macrosystems" to distinguish them from special tools or "microsystems" (p. 317).

Because of the relationship between knowledge creation and bibliographic organization, these two main divisions of the information environment can be conceived as complementary contexts for encoding information about information sources, hence the label "two-part, dual context knowledge base."

The prebibliographic terrain may, in fact, be the mental model held by any information seeker who is not trained in library science. Given people's experiential relationship to social structure, and their secondary relationship to bibliographic organization, people may be more attuned to institutions and organizations than to libraries and documents. As Hunt (1989) notes in a discussion of cognitive theories of classification, novices use different classification schemas than experts, "simply because they have less sophisticated theories about how the field is organized" (p. 622). The reliance on a mental model of institutional sources may persist for end-users who use it exclusively. However, the analysis of case studies of reference and this author's experience suggest that professional intermediaries use the prebibliographic terrain as a backup. There are situations when a search path is more easily identified by thinking in terms of the origins of the information.

For example, the patron asks a science librarian about getting information about DNA fingerprinting. In the course of the question negotiation and the search, the librarian might ask, "Who would be involved with that issue?" or, "Who's likely to be engaged in that topic?" Maybe the librarian's mind even scans the prebibliographic terrain for likely sources, forming a picture of institutional activity and people at work. Lawyers, expert witnesses, geneticists, and regulatory agencies are considered. These thoughts evoke ideas about likely search paths. This helps in querying the patron further to determine which aspect of the subject is most important in order to make the search more relevant.

Perhaps the librarian learns that the patron is interested mainly in the legality of forensic evidence and decides that the patron is better off starting the search at the law library. If the patron wants a comprehensive search, the librarian is reminded to search Legal Research Index, the NTIS database, and the Monthly Catalog as well
Figure 5. The Searcher's Knowledge Base: Bibliographic Divisions of the Information Environment. The searcher characterizes libraries, collections, and formats in terms of subject, content, use, availability. The searcher classifies the query in terms of these attributes in order to translate the query into system terms. Only selected attributes of major divisions of the bibliographic terrain are shown for purposes of illustration. A comprehensive associative network with all divisions and a rich vocabulary of attributes has yet to be created and graphically displayed.
as _Biotechnology Abstracts_. In other words, thinking prebibliographically evokes options for positioning the question in one or more subject contexts and formats. Because the prebibliographic terrain and the bibliographic terrain are complementary, it requires only a small mental shift to reposition the search paths from institutional sources to bibliographic sources.

Every question does not require this train of thought. It depends on experience with the subject, the library setting, and the requestor’s true need. At the opposite end of the scale is the known item search in which the requestor asks for a specific answer source by title and the searcher does not have to reason out a search strategy. In between these extremes are questions that require only bibliographic thinking. The searcher analyzes the question in terms of the attributes of libraries or documents, a process which directly links the question to one or more document classes, without reference to institutional sources.

Theoretically the map of the information environment is the same for all searchers. Operationally it will differ depending on the library setting, clientele, expectations, reference policy, and the particular question being asked. In actuality, it will differ by skill level, education, training, and experience. The less knowledge of bibliographic organization, the more the searcher will rely on prebibliographic thinking to evoke ideas for search paths. On the other hand, the more experienced searcher will also rely on prebibliographic thinking for difficult questions and to avoid mental ruts.

**SEARCH PATH SELECTION PRECEDES SELECTION OF A SPECIFIC ANSWER SOURCE**

As the DNA example illustrates, selection of a search path often precedes selection of a specific answer source. The searcher chooses law, biotechnology, or government before selecting _Legal Resource Index_, _Biotechnology Abstracts_, or the _Monthly Catalog_. If the question is about tuna fishermen and the killing of dolphins, the searcher can choose one or more subject domains—e.g., public affairs, science, environment, government. Each is a different search path. The choice also may be driven by format given the characteristic relationship between content and format. Technical reports, newspaper stories, and films are very different search paths.
Figure 6. Attributes are the Link Between the Query and the Information System. The searcher analyzes the query in terms of the characteristics of answer-providing sources. In so doing, the query is translated into system terms.
Cognitively, Attributes Link the Question and Search Paths

Attributes are the interface language that translates the question into system terms. Questions must be formulated and further analyzed with these attributes in mind. This is required in order to make the mental leap between questions and answer sources. Attributes link questions and answers. They are the mental bridge (see Figure 6).

The More Attributes Found, the More Flexible and Creative the Search Strategy

In one of Grogan's (1972) case studies, the user wanted to know the local authority for "Great Cheverell." Grogan classified the question as "geographic," an attribute of gazetteers, atlases, and maps. However, this search path hit a dead end. Great Cheverell did not seem to be a place name. He re-analyzed the question and reclassified Great Cheverell as an "administrative unit," an attribute of administrative area maps prepared by government agencies. This search path was fruitful. Ultimately he checked Ordnance Survey county administrative area maps where he found the answer.

The second example is a question that came over the telephone to the science reference desk. A caller asks "What is the correct spelling for the mineral meehanite and what is it made from?" "Mineral" is an attribute of "geology," which is a specialized subject. "Correct spelling" is an attribute of dictionaries. "Made from" is conceptualized as "formula" or "properties," which are conceived as "factual data." These are all attributes of reference materials. Putting it all together, the searcher now knows that she is looking for a subject dictionary in geology. Knowing the arrangement of her reference collection and the classification for geology, she goes to the shelf and retrieves the appropriate source. The example is simple because we make this translation almost automatically. Cognitively, however, it is a fascinating walk through the associative map of the information environment.

Application of the Model to Question Formulation

Question formulation is a process whose goal is to position the question along one or more search paths. A good subject question is expressed in interface language, which orients the question outward toward the information system rather than inward toward the topic of the question. Interface language uses the vocabulary of attributes and search paths to specify the direction of the search. Although the requirements for a good subject question are the same for all queries, the amount of cognitive work that the user must do depends
on the subject of the question, its complexity, the original wording of the question as it comes into the user's mind, and the outcome of the initial search for information.

The utilization of the question formulation method makes the end-user an active participant in the reference process and thus a better consumer of what the library has to offer. To the extent that the end-user understands the divisions of the information environment and the attributes of answer-providing sources, the more independent the user will be. Knowing the rules for question formulation empowers the user (Huston & Perry, 1987).

Figures 7 and 8 summarize the operations that seem to be required for clearly and completely expressing a need for information. Figure 7 shows that the method is not always a straight path from “representation” to “specification.” Depending on the complexity of the question or the outcome of the initial search, there may be need to re-analyze the query until new search paths open.

The end-user starts with a topic-oriented “representation” of the information need and concludes with interface language that re-orient the question to the information environment. At that stage the intermediary can complete the translation into system terms and define a search strategy directed to sources in or out of the library—i.e., to specific libraries, collections, tools, or outside agencies.

**Rules for Question Formulation**

To “represent” is to start the process by internally voicing the main topic of the information need. The initial “representation” is oriented inward to the subject, not outward to the system that will satisfy the information need. For example, the user wonders about the first use of the SOS signal, or the effect of infant bonding on adolescent development, or the design requirements for a smart robot, or the colleges that offer a major in evolutionary biology.

To “expand” is to shift the focus of attention beyond the narrow confines of the topic. An expand defines the project (not just the subject of the question) in terms of topic, deadline, kind and amount of information, and so forth. Expansion of the topic also involves a “segmentation” of the topic into all relevant concepts, similar to preparing a database search. “First use,” “SOS signal,” “infant bonding,” and “adolescent development,” “design requirement,” “smart robot,” “college majors,” and “evolutionary biology” are the concepts from the examples above. The following is an illustration of the “expand” operation for the question about infant bonding:

**Topic Parameters**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Bonding/adolescent development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time frame</td>
<td>Current</td>
</tr>
<tr>
<td>Geographic scope</td>
<td>United States</td>
</tr>
</tbody>
</table>
Figure 7. Operations for Formulating Good Subject Questions. The initial REPRESENTATION is topic-oriented. The final SPECIFICATION is system-oriented and describes the characteristics of potential answer-providing sources. The re-orientation from REPRESENTATION to SPECIFICATION depends on the end-user’s knowledge of the divisions of the information environment and their attributes.
To generalize/contextualize is to interpret the project (topic and other parameters) at a higher level of abstraction or to identify equivalent, related, or broader terms that evoke for the user ideas about likely answer-providing sources. Using the preceding example, the user can say that he is looking for some "basic," "background," "current," "available," "printed" materials about a "psychology" topic. These attributes are a more abstract, information system-oriented way of saying that this undergraduate is writing a brief term paper on adolescent development and infant bonding and that the paper is due next week.

The purpose is not to find subject headings or indexing terms. That is a later step outside the scope of these operations. Rather, the goal is to conceive of the query in as many different ways as
necessary to get ideas for likely search paths—e.g., for the example above, psychology texts and magazines. By looking at the subject of the query conceptually, these operations will help guide the user to appropriate domains and formats.

These interrelated operations typically involve normal everyday classification and categorization of ideas, terms, and concepts. The operations rely on experience, general education, and attunement to the culture. The outcome is also heavily influenced by the user's cognitive flexibility, which is required in order to avoid "hardening of the categories" (Neill, 1975, p. 314).

Specifically, to "generalize" is to broaden the categories for each concept involved in order to conceive of the query in more general terms. An airplane accident is a transportation accident. Holsteins are cows. Cars are vehicles. Peonies are flowers, and robins are birds. Wilson (1968) called these "analytic associations." Analytic associations are a matter of definition and tend to imply a hierarchical relationship.

"Contextualizations" help define context. Broadly defined here, they are a form of conceptualization that places subjects in a certain light. Contextualizations define subjects and link one subject to other subjects, events, ideas, and subject domains that are related as a matter of historical, biographical, and social fact. Donald Trump is a billionaire, a real estate developer, a tycoon, an empire builder. "Infant bonding" is a psychological variable. Adolescent development is a popular topic for the media, clinicians, and social scientists. A question about Holsteins may be a question about cows in the context of biology or farming or agribusiness or all of the above. A question about sauna baths is a question about machinery or consumerism or fads or health or Swedish popular culture. A question about diamonds can be a question about economics or minerals or jewelry or wedding customs. A question about knots can relate to cowboys, religion, science, fishing, sailing, and execution by hanging. A plane crash is a technological failure, a civil disaster, and perhaps, an international incident.

The purpose of these abstractions is to evoke ideas about sources of information. Perhaps the concepts "international incident" or "public disaster" are more evocative than "plane crash" for identifying different search paths.

Each person has a unique semantic network of associations. Certain terms are more or less likely to evoke ideas about answer-providing sources and will vary according to the user's need, purpose, experience, and frame of reference.

To "position" is to use the output of "generalizing" or "contextualizing" to orient the question to one or more subject
domains and formats. This operation uses either bibliographic or prebibliographic thinking, depending on the user's familiarity with the information system.

Using prebibliographic thinking, the user thinks in terms of the origins of information within the social structure. In this case, "positioning" is a journalistic approach to the question. The ability to carry out the operation relies on the user's knowledge about how society works rather than on knowledge of the information environment.

When users learn to "draw from their own experiences with social organization" they will figure out where to find information about many subjects (Huston, 1983, p. 186). By approaching the question like a journalist rather than like a librarian, the user will figure out that news reporters cover plane crashes, the federal government must launch an official inquiry, and insurance companies will certainly develop expertise because it is their business to cover the airlines and passengers (Rubens, 1982, p. 14). Maybe the user forgets government sources when the subject is conceptualized as "plane crash." However, "contextualizing" the subject as a question about a "public disaster" or a "regulated industry" may activate the associations that lead to the anticipation that government is a likely source of information.

In approaching the question this way, the user will use a "probe" technique that is typically used by professional searchers in practice but underreported in the literature. Huston (1983) mentioned the following "probing" questions to illustrate the journalistic or sociological approach to question analysis: "What group of people/kind of profession would have thought about this topic? How would they have presented the information—a film, report, book?" (p. 186).

It does not require library training to make these associations. These associations come about through what is learned about and experienced in the world. The ability to think abstractly like this is a function of general education, upbringing, and life experience (Rubens, 1982, p. 3). As Huston (1983) says:

With such a sociological approach, information is not cataloged in terms of bibliographic organization but in terms of the sectors of society and human enterprises from which information about different subjects, packaged in different formats, arises. Such an awareness is developed as we are enculturated in society... (p. 186)

If the user "positions" using bibliographic thinking instead, the output will be expressed in terms of literatures or collections rather than institutions or professions—i.e., government documents rather than government agencies; medical literature rather than hospitals; research reports rather than laboratories or scientists; newspaper collections rather than news organizations or reporters; fiction
collection rather than trade publishers or creative writers. However, regardless of the cognitive terrain used to position the query, the outcome is a description of an answer-providing source (see Figure 8).

To “specify” is to express, in one or more declarative sentences, the attributes of the ideal answer-providing source(s). A “specification” is the voiced query using interface language.

Using the example about adolescent development, the initial “representation” is something like “I’d like to know more about infant bonding and adolescent development.” The final “specification” gives the context for the question, the subject, and the characteristics of answer-providing sources. For example, the user might say the following (interface language is printed in all capitals):

“I’m writing a term paper on infant bonding and adolescent development. I need about 10 BASIC sources that are CURRENT and NOT TECHNICAL. I’ll need material available here because the paper is due next week. I know the topic is pretty popular right now so I figure that research is being reported in PSYCHOLOGY MAGAZINES, PARENTING MAGAZINES, and NEWSPAPER articles. If I have to use the PSYCHOLOGY LITERATURE, it should be a TEXTBOOK I can understand. I want to stick with the PSYCHOLOGY LITERATURE because I’m interested in INDIVIDUALS, and not GROUPS of people, and I’m interested mostly in my OWN CULTURE.”

If selected materials are not on the shelf, the user theoretically will have alternatives in mind, such as using related literature in “sociology” and “anthropology” and “education.”

In this “specification,” the user names attributes such as “basic,” “current,” “not technical,” “can understand,” “available,” “individuals not groups of people,” “my own culture,” “popular topic,” “psychology,” all of which result from his “expansion,” “generalization,” and “contextualization.” The attributes of current, basic, easy to read, popular, and readily available point to the popular press and general magazines and texts. Although not expressed in the “specification,” the user has classified the topic as belonging to the field of psychology because “bonding” is a psychological variable and “development” is a focus of interest for psychologists.

In this case, the thinking seems to be bibliographic, resulting in the “specification” of literatures and formats rather than institutions or professions. However, depending on experience and the motivation for the project (perhaps the user is in therapy), the user may have first thought prebibliographically in terms of psychologists, writers, and reporters. If so, it is probably a small mental leap for most college students from “psychologists” to
"psychology journals" and from "writers" and "reporters" to "magazines" and "newspapers." The route to a bibliographic "specification" is sometimes by way of a nonbibliographic "specification" (see Figure 8).

Here is a complete example, based on a reference transaction at the author's library, to illustrate the question formulation method. In this example, the initial question is straightforward. The "representation" is close to a "specification." However, a printed source was not available. The student had to find the answer indirectly by networking through the academic community. Prompted by the librarian, the student approached the question journalistically and came up with a search strategy using prebibliographic thinking.

Representa­tion:

"I'm trying to find colleges that offer a major in evolutionary biology."

Expansion/Segmentation:

<table>
<thead>
<tr>
<th>Topic Parameters</th>
<th>Project Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects</td>
<td>Purpose</td>
</tr>
<tr>
<td>College major/evolutionary biology</td>
<td>Admissions</td>
</tr>
<tr>
<td>Time frame</td>
<td>Amount of material</td>
</tr>
<tr>
<td>Current</td>
<td>One list</td>
</tr>
<tr>
<td>Geographic scope</td>
<td>Depth, breadth, technical level</td>
</tr>
<tr>
<td>United States</td>
<td>Description/ranks</td>
</tr>
<tr>
<td></td>
<td>Language comprehension</td>
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<td></td>
<td>NA</td>
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<td></td>
<td>Literacy level</td>
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<td>NA</td>
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<td></td>
<td>Media</td>
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<td></td>
<td>Print</td>
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<tr>
<td></td>
<td>Deadline</td>
</tr>
<tr>
<td></td>
<td>Three weeks</td>
</tr>
</tbody>
</table>

Analysis/contextualization:
Selective, evaluative, current list of colleges in the biological or natural sciences.

Position:

Bibliographic thinking: directories or guides in the science collection.

Specification 1:

I want a current list of colleges that have majors in evolutionary biology. I want to contact some programs so I need the address of the admissions office and a phone number. I want to know the best programs so I need some reviews or evaluations or ratings. Maybe there's a selected guide like I've seen for some other science programs.

Re-analysis and contextualization:

People who are prominent in the field or considered to be authorities.
Position:
Prebibliographic thinking using "probe": If people are prominent in the field or considered to be authorities, where might their name be seen? What role do they play? Who would know about good programs?

EDITORS and EDITORIAL BOARD of KEY JOURNALS in the field, PROFESSIONAL ASSOCIATIONS, AUTHORS of current books and review articles.

Specification 2:
I'm looking for a list of the key journals and books in the field of evolutionary biology. I want to see which schools these people are with. I may also need the names of large professional associations.

DISCUSSION
Will students appreciate the value of learning the question formulation model and techniques? Yes, if introduced in consumer terms. The question formulation model teaches the attributes of answer-providing sources. Students, like other consumers, understand the importance of knowing product characteristics before making a purchasing decision. In this age of empowerment and autonomy, students may welcome an opportunity to participate actively in the reference transaction.

Can the question formulation model be taught? Yes. The literature on teaching students by building on what they know (Huston, 1983) suggests that students understand a great deal about social structure and the attributes of information sources, and that they learn to relate that knowledge to bibliographic organization. Much of this knowledge is intuitive based on observation and experience; some aspects must be taught or brought to conscious awareness. Students can learn the attributes of answer-providing sources if told what they are and why they are important to information seeking. They can be taught to pose questions in terms of interface language if they are given practice in analyzing and contextualizing questions and given proof that a "specification" is more evocative and personally empowering than a "representation."

Is the thinking-like-a-searcher model sound? Based as it is on soft methodological techniques, the model and its application to question formulation need to be field tested using model curricula. It will be a challenge to create curriculum material. A comprehensive map of the information environment has yet to be created and will
require the combined efforts of cognitive scientists, knowledge engineers, and information specialists. However, major divisions of the information environment and their attributes, as suggested in Figures 4 and 5, are readily identifiable. Librarians work everyday with subject classifications, authority lists, and reference tools that can be used as a basis for teaching the institutional structure, subject fields, academic disciplines, literature types, and formats. Some of these tools are Library of Congress subject headings, Library of Congress and Dewey Decimal classifications, Superintendent of Documents classification, *Encyclopedia of Associations*, and DIALOG’s list of subject categories. Using creative thinking techniques such as brainstorming and visualizations, hands-on experience with different literatures and literature types, and practice analyzing questions in terms of attributes of answer-providing sources, students can begin to speak the language of knowledge creation and bibliographic organization. In so doing, end-users become active partners in the information-seeking process.

**Acknowledgment**

Nancy J. Rohde and Robin Crickman, my faculty advisors at the University of Minnesota School of Library and Information Science, provided invaluable support during the initial phase of the research leading to my master's thesis. I am indebted to Mary Huston for seeking out my work, assisting me in the revision and publication of the original model, and inviting me to apply the results to bibliographic instruction.
APPENDIX

(Terms from this glossary used to define other glossary terms are italicized)

Attributes. Characteristics of institutional and bibliographic sources. "Current" is an attribute of newspapers, newsletters, magazines, and journals. "Public" and "official" are attributes of government sources.

Bibliographic Terrain. The part of the knowledge base having to do with bibliographic organization. Complemented by the prebibliographic terrain.

Contextualize. To conceptualize the question in terms of the context to which it belongs. A question about Holsteins can be a question about veterinary medicine, farming, food.

Expand. To shift the focus of the question beyond the topic. Defines the project, not just the topic, by considering deadline, purpose, use of the material, language requirement, amount of material needed, and other question parameters.

Generalize. To interpret the question at a higher level of abstraction. A question about Holsteins is a question about cows or animals.

Information Environment. All sources of information, including institutional sources and document sources. The information environment extends beyond the local collection to include all potential answer-providing sources, be they persons, groups, or documents.

Interface Language. Vocabulary consists of search paths and attributes. Used to specify the characteristics of selected answer-providing sources and the direction of the search.

Knowledge Base. What the professional intermediary knows about the information environment. Elaborate map of the divisions of the information environment and their attributes. A two-part, dual context representation of the information environment, encompassing knowledge of institutional sources from which information arises (prebibliographic terrain), as well as knowledge of libraries, collections, and classes of documents (bibliographic terrain).

Position. To orient the question to one or more subject domains or formats. To determine appropriate search paths.

Prebibliographic Terrain. The part of the knowledge base having to do with institutional (primary) sources. Complemented by the bibliographic terrain.

Probe. To approach the question journalistically or sociologically. To ask "Who is interested/writes about this topic?"

Question Parameters. Topic and Project-oriented facets of the question. Topic facets include subject, time frame, and geographic scope. Project facets include purpose, amount of material desired; depth, breadth, technical level; language comprehension, literacy level, media, deadline (see Expand).

Represent or Representation. The initial internal expression of an information need. Tends to be topic oriented.

Search Path. The direction that the search will go. Expressed in terms of classes of documents, collections, libraries, institutions. "Newspapers" is a search path as is "trade associations."

Segment. To divide the topic of the question into its individual concepts as is done to prepare for a database search.

Specify or Specification. To express, in one or more declarative sentences, the attributes of appropriate answer-providing sources and the direction of the search. Final result of question formulation method (compare represent).
Thinking Bibliographically. Analyzing a question in terms of the attributes of libraries, collections, documents.

Thinking Prebibliographically. Analyzing a question in terms of the attributes of institutional sources.
REFERENCES

ADDITIONAL REFERENCES


Access Ability: Harnessing Knowledge of “Thinking Like a Searcher”

MARIE FIELDER AND MARY M. HUSTON

ABSTRACT
This article is in two parts, indicating two aspects of a unified whole. The first section describes the teaching experiences from which the second part, an instructional text, was derived. Together, these discussions illuminate aspects of a fundamental reorientation in teaching and learning about information. This reconceptualization transforms the traditional dynamics in the classroom so as to place student learners’ knowledge at center stage. As the classroom examples illustrate, such an inclusive approach encourages exchanges which approximate that of the scholarly communication systems which participants are studying. Through harnessing knowledge accrued through their own experiences, students can then, empowered, enter the domain of “learned information.”

THE INTENTIONALITY OF THE INQUIRY
Ideas cannot be detached from the experiences which birthed them and so this discussion will begin by describing the classroom situation which informed the subsequent curriculum development. The joint investigation into the teaching of inquiry had its origin in our shared belief that individuals who lack formal research training do, however, possess substantial knowledge that might be applied to searching the scholarly literature. More specifically, the inquiry was predicated on the assumption that, through daily problem-
solving experiences, individuals develop information-gathering and problem-solving expertise which prepares them for academic information handling.

With the intention of discovering the everyday experiences which could provide the foundation for an information education program which engaged and extended individuals' existing understandings and abilities, we embarked on a one-quarter research study at the Tacoma, Washington, campus of The Evergreen State College (TESC) in January 1987. Sixty-five culturally diverse, academically inexperienced students and eight faculty members and community experts ultimately contributed to the project.

The resultant teaching model developed from the communication systems found to be common to both "everyday" and scholarly information exchanges has been reported elsewhere in the literature (Huston, 1989; Huston & Oberman, 1989). This article, therefore, will focus on the generativity of the pedagogical method, so as to describe a generic approach for participant-driven curriculum development. In the process, the information-seeking knowledge possessed by student participants will be exemplified so as to illustrate how their existent expertise was enhanced through classroom instruction.

THE EVOLUTION OF PARTICIPANT-INFORMED EDUCATION

With the consultative encouragement of Marie Fielder, an educational consultant from Berkeley, California, The Evergreen State College's library research course (Huston & Perry, 1987) assumed a new level of responsiveness to participants during the winter quarter of the 1986-87 academic year. Whereas in previous academic quarters course content had been determined by librarian instructors, the assumed "experts" on the subject of information seeking, Fielder encouraged the three co-instructors—only one of whom was an academic librarian—to allow the student learners to provide the content of each week's three-hour class session.

Faculty members W. F. "Joye" Hardiman, Sally Riewald, and Mary M. Huston had willingly agreed to try this approach out of concern for weaknesses they had observed in the traditional instructional method whereby students located bibliographically-controlled information through the library-finding tools recommended by librarians. The teaching team recognized that this method encouraged students to remain passive consumers of experts' "second-hand knowledge" (Wilson, 1983) through encouraging their dependency on librarians' professional expertise and their subsequent uncritical acceptance of library owned information.

Through user-centered problem focused instruction, these educators hoped to cultivate students' critical engagement with
information by first creating an environment in which student learners' strengths assumed center stage and, second, by requiring that class participants meaningfully utilized information sources. In these ways, they hoped to further individuals' active evaluation and interpretation of sources during information handling, whether in their daily lives or in formal literature searching.

**Creating an Empowering Environment**

The intended course outcomes for the class were defined for students by Huston in these terms: "that you be producers of information, that you take the information and evaluate it and work with it in ways that are not at all passive, in ways that give you the power rather than allow the information to have power over you" (Huston, 1988, p. 60). So as to encourage them to become active creators of information, the sixty-five participants in the study were expected to identify, evaluate, analyze, synthesize, and disseminate information during the quarter.

**Infusing Excellence Throughout the Curriculum**

For purposes of this study, learners were not given specific directions by faculty. Early in the quarter, for instance, they were challenged to formulate compelling research questions so as to conduct informative investigations in preparation for reporting on their experiences at the end of the quarter. They were not provided with instruction on research strategy; rather, they were given generic counsel, as they requested it, in weekly group meetings.

During the first class session, for example, learners were charged with selecting research topics of "passionate" personal interest and local significance. When they expressed uncertainty over that assignment, Fielder talked with them more specifically on "problem finding." She counseled them to "own" their personal researching authority and create "provocative declaratives" out of their topical interests. In underscoring her theme, she said: "You're intellectuals. You know what to ask." Subsequently, during the following week's class, she challenged them further, saying: "As intellectuals, you are held responsible for the right questions." Her remarks accurately anticipated the intellectual and emotional needs of the group, and, with a sense of excitement and possibility, they proceeded in forging their research interests.

During the third session, they expressed uncertainty about how to make choices among information sources and requested some basic vocabulary with which to make distinctions among resources. So, as students described the kinds of information they had located, the
instructors provided them with appropriate specialized terms, such as primary and secondary sources, scientific method, and multidisciplinary.

With chalk on a blackboard and broad-based student input, instructors graphically developed models of the information generation process in academic disciplines (McInnis, 1982; Keresztesi, 1982). The group also discussed information generation in social institutions (Rubens & Huston, 1989). Relatedly, in response to students' requests for discussion on accessing as yet uncollected information, instructors encouraged students to tell one another about questionnaires and interviews in which they had participated. Together, through dialogue, student and faculty learners pieced together the basics of social science field work techniques.

Later in the quarter, as learners were beginning to consider possible audiences for their developing ideas, they asked faculty for more specific information on the creation, dissemination, storage, retrieval, and delivery of the society's official "knowledge." Initially referencing common experiences with the newspaper, magazine, and television media, instructors then facilitated a discussion about the communication systems which feed information into those media. Both student and faculty learners contributed wide-ranging information about the subject.

Because many student learners subsequently came to question the "place" of their perspectives in either library owned or nonlibrary owned information, they next requested more detailed information on the social structures impinging on the dissemination of ideas. Faculty invited guest presenters—a Black sociologist, an oral historian, and an ancient Egyptologist—through whom students gained a sense of the differences in perspectives and procedures among researchers investigating a common topic. These resource people exemplified schools of thought among societal populations both with and without social and economic privilege. They ably discussed the diverse "voices" representing majority and minority viewpoints in the published literatures.

For instance, as the author of two self-published books on Blacks in early Washington State, historian Esther Mumford spoke of the powerful stories she had recorded during her years of conducting oral interviews to "broaden the scope and purpose of history." Fortified with anecdotes of information-gathering issues, resources, and techniques, and assured by the faculty that "You will know what to do," students continued to invent ways to further investigate their research topics.
THE SUBSTANCE OF EMPOWERED INVESTIGATIONS

A most striking aspect of the interview data was the robust searching which characterized learners' information-gathering activities, beginning with characteristically strong statements of a research problem and extending into knowledgeable selection of information sources.

Problem Finding

Typically, individuals with especially compelling research interests had significant personal experiences—in duration or in intensity—with their subjects. Their investigations were driven by a lack of "sense" (Dervin, 1977) about some aspect of their situations. That uncertainty was translated into a research question.

For instance, a first generation college student and a Black military retiree investigated the success rates for this population in Puget Sound area community colleges. His research topic had its origins in disturbing patterns he had observed among his peers.

Some of these people have children in school who are 17-18 years old and ... when they come out of the military, they ... say, 'Well, I can't go back and tell my family I need a remedial class. I'm taking English 80 and my son's taking 102. I can't ... ask my son to help me study.' They can't face those kinds of problems and ... they just drop out.

Having worked with a hospital's sex offender program for two years, another student forged a research query out of these experiences. She had seen many offenders: "Mostly men are coming through there and 90% of them being white and only a few of them Blacks or Asians or Indians..."; she perceived a pattern of white abusers and nonwhite victims. For her research project, she investigated the frequency and causality of the offender phenomena in the Tacoma, Washington, area.

Problem Solving

Learners' comments typically conveyed their assurance in puzzling out where and how particular data could be found. In describing one of his search strategies for investigating historical race relations in the Seattle-Tacoma area, for instance, a retired military student stated:

I was fortunate to have served in the army with a Japanese-American whose parents had been part of the incarceration and internment of the Japanese during the Second World War. That led to the most expensive part of my research because, to get this interview, I had to buy the rascal dinner! And he discussed with me the really tough time his parents had during their internment.

In describing their search pathways, students enumerated a rich list of potential sources of information. Their choices conveyed a
confident, deeply ingrained sense of where they should go to obtain needed information, given the ways in which information about different subjects arise. For instance, despite one student's probable desire to please the instructor, she said: "I could go to the library and do some more cross-checking on some of the facts [but] ... what wound up being a better cross-check was to go knock on two other neighbors' doors and both of them told me, 'Oh, no, he's wrong.... I remember when such and such happened....' "

Information Resources

As stated by one person with a clear sense of the information terrain, "you see areas where you need to go...." When classified, learners' collective "information universe" was divisible into three major repositories of information: informal sources, institutional sources, and library sources. Although potential information sources were mentioned as available by students, some resources were more accessible to novices than others.

Informal Sources. The first of these categories, informal sources, was frequently recognized as a "close at hand" source of information. Informal sources were perceived as available in the form of personal knowledge, casual reading, collegial or neighborly chats, and personal observations.

The origin of one student's topic was an article he happened to read.

One of the things that got me interested in the history of the light company is ... an article on the different price ranges of the rates in the country, and I found out that our city light—Tacoma City Light—has the cheapest power in the whole United States and also that they have lots of firsts. They were the first ones to start generating power in the Northwest....the first to establish paying for kilowatt hours instead of just paying for the amount of light bulbs....

Another person observed that his research also involved familiar material: "half of the information I used came out of my own library.... It was just a matter of looking up the information I knew was there," information which he re-analyzed to make unfamiliar conclusions.

Information from informal sources was sometimes obtained quite by accident, serendipitously, as another individual divulged when she described two incidents in researching the history of her house, 911 North Third in Tacoma, Washington.

A lot of the things that I found were by accident. I was down at Fox Bookstore two weeks ago, thumbing through the "Blue Book," which is a society register of early Tacoma, and a name popped out that I recognized. Fumbling through the book, I found another name and then I came upon the address of our house with someone in there that I didn't know had ever lived in the house.
On another occasion, she recalled: “We met some people in the Tacoma library who were also doing research on Tacoma and they invited us to their homes and shared with us data that they had gathered....”

There was a sense of “conductivity,” a natural flow/movement, in students’ descriptions of research among informal information sources—that is, one thing led to another.

**Institutional Sources.** Institutional sources were another potential resource category for informants. Such sources include all the information developed by society’s institutions—i.e., governments, corporations, churches, voluntary associations, schools, and trade unions. These institutions offered both a paper trail recording their information and a corps of knowledgeable people conversant in their activities.

In explaining her primary information source, one student said:

I wanted to focus on [comparable worth in] Tacoma ... and I knew that there had been a study done about a year ago for city employees ... so I did find a lady ... who is the women’s rights supervisor for the department of human rights in Tacoma, and she had been very involved right from the very beginning through the entire process of the study and up to the point that it was presented to the city council. I interviewed with her and found out things that you only find out by interviewing someone who had been there from step one all the way through....

In conducting research on the sexual abuse of minority children in Pierce County, another student approached personnel from two governmental institutions with relevant jurisdictional responsibilities. As she explained: “I had an interview with child protection services on this.... Some of the information I’m attempting to get from the Tacoma Police Department, they do not want to give due to the confidentiality surrounding such a harsh subject.”

Frustrated but persevering, she intended to approach a third government institution, saying: “You almost have to go to the governor’s office to get this information that I want.” Not to be outdone, another student claimed that, to obtain an interview with a top national security defense commander, he was willing to procure “a note from the President.” Surely the most unusual institutional sources were those of the student who researched the history of Tacoma cemeteries “from the dead files on the granite stones ... and through touring memorial facilities.” Such comments evidenced learners’ well-instilled understanding of the structure and function of social institutions, including the material culture of death and burial, and the points of information access within those organizational schemas.
Library Sources. Library sources constituted the third class of information resources. Libraries house formally organized collections of human wisdom or, as one author-librarian has said, control "metaphysical meanings by means of physical conditions" (Wright, 1979, p. 74). The remarks of students who consulted library resources demonstrated their awareness of the physical manifestations of the accumulation of knowledge—i.e., the library building, the periodical index, the monographic volume. In some cases, student learners obviously assumed, though they did not specifically state, that human thought was represented in these physical embodiments.

Typically, students' consultation of library resources was presented in a perfunctory fashion with no elaboration. In contrast to other information domains, they seldom told stories about their library investigations. One individual, for instance, said of his consultation of a card catalog only that he found "several inches of cards on the Chinese."

Her investigation on child support enforcement laws in the state required that another learner "had to do a lot of digging into the laws of Washington, specifically the Revised Code of Washington's Chapter 74.20 and 26.18." Yet another individual "went to the state capital library...what do you call it?...archives." And, in investigating the funding of Washington state's athletes, another person "did a search of the periodical indexes and got some information here."

Two students who consulted special collections described some engagement with the substance of library resources. One said of her experience with primary material:

at the manuscripts division of the University of Washington Library....
I was able to read the transcription of the minutes of the Japanese-American student club which was terrific because I read right up to March—oh, I think it was March 22nd—the day before they were evacuated.

The second reported her experience that information generated the need for more information. The creation of new meaning—in her case, a seeming contradiction—led to new questions for her.

most records are very poor.... The most concrete evidence I found of the house [construction date] was in the Northwest Room in the Tacoma Public Library... a fire insurance map, and the house was there in 1892. However, on my deed the land was platted in 1875.... So it's really a mystery.

More typically, though, needed information was not obtained through consultation of library resources. One student spoke of her dissatisfaction in seeking a monograph on the Everett Massacre, a labor union, law enforcement conflict in the Pacific Northwest. Of her searching in the circulating collection of a public library, she said: "I was looking for one book that I knew existed. It had been
checked out. There were five copies of it and they were all gone. It took me a while to get back into doing anything about it because I was so stunned."

Librarians were typically seen as the necessary guides to the collection. In researching the Pierce County organization Alcoholics Anonymous, a student learner "went to the Northwest Room at the library. The librarian there gave me a folder of thousands of old and new clippings...." Contrasting the librarian's skill with her own, another individual found in investigating Gig Harbor's environmental problems that "the librarian was the chief source of information because I would never have thought of going to 'Environment Impact Reports'."

In referring to librarians, one individual even employed playful humor. She "found most of my information in the Washington Law Library" and also "found it very helpful to snuggle up to the librarian." The warmth embodied in these comments about librarians' assistance speaks to the potential satisfaction available to novices when they are expertly guided through the library environment.

Despite the availability of computer-based information systems in the local libraries, no one consulted machine-readable resources. There were, however, two acknowledgments of the potential value of such a service. One person noted that it would be "helpful to have a database in the library to support me.... I can just plug in and get what I want. It can save me a lot of time in going here and there...." Another also wanted "the data system to access this information [which]... would have saved me hours of research time...."

Both of the other comments on CD-ROM and online database searching attested to the disappointment of the learners who were unable to obtain needed information from computerized information systems in public institutions. As one individual said: "They indicated that it wasn't available in the form that I needed, but ... I would say that it ... seemed to be computer data because, from the way that I perceive it, it had to be there." Given the side-by-side availability of both traditional print indexing services and their machine-readable counterparts in most libraries visited by the student researchers, it is noteworthy that few attempted computer-based searching and that none successfully retrieved information from such systems. On the other hand, since most of the topics were local in scope, it is perhaps not surprising that those who tried reported failure.

Although many student researchers visited local libraries, in only a few cases did these repositories seem to come "alive." The "voices" embedded in library documentation did not "speak" to most. Rather, for most, library research was "flat" and, their remarks further
suggested, was characteristically unfamiliar and unsatisfying. They did not feel at home in the library, nor did they feel a part of the published discussions housed there.

**Search Strategizing**

Learners typically reported where they went for information (as presented earlier), and, less frequently, how they got there and what they did there. In other words, less was reported by students about their search processes than their information resources, although interviews did reveal substantial existing knowledge about the processes of information gathering as reported by Bates (1979a, 1979b).

Overall, learners expressed significant conceptual awareness in describing information. For instance, the existence of pervasive lines of inquiry was recognized by one person who stated: “I didn’t realize until I got into it that almost everything I was reading was party line. It was ... backing big business and U.S. forestry.” Other frames of reference were inaccessible, as another individual discovered. “My original intent was to look at the prostitutes as individuals. I found absolutely no information on that, so I had to look at it more as an institution and how it influenced the growth and development of Seattle.”

Some arguments in published literature appeared monolithic, other perspectives were absent, and other subjects were underrepresented. As one individual said of her research project: “My paper’s on emerging women writers. I found research easy on northern European women.... But I also want to include information on women of color, and did not find that so easy to find.” Another individual also reported poor coverage on his topic, the history of jazz in Seattle, Washington, from 1930 to the present. “There’s a lot of information on acclaimed musicians. Of course, Quincy Jones came from Seattle, and you’ll find lots of articles and other publications on Quincy Jones. But the common musician and the music after WWII ... there’s very little material.”

Some people recognized linkages within information domains. As one woman said of her experiences researching the history of nursing schools in Tacoma, Washington, through informal sources: “They’d give me the name of somebody else who would give me the name of somebody else who would give me the name of somebody else.”

It was apparent from the many learners who reported consulting both informal and institutional sources that they understood there to be communication linkages, as well, between information in those
domains. They moved easily—sometimes effortlessly—along lines of inquiry both within and across the boundaries distinguishing informal, institutional, and library sources.

Through referrals, for instance, two individuals experienced a topical linkage from informal sources to library resources. One was referred by an informal source to a library source written with institutional sponsorship—i.e., "one book published by the librarian from Tacoma Community College. She did it for the Bicentennial Project." For this individual, library access was simplified by this evaluative recommendation of a "known item."

In examining sources from two domains, one person noted that there are differences in the information they provide. "I interviewed some members of the academic community.... I did a search of the periodical indexes.... I found different perspectives." Another individual used this to advantage, comparing perspectives from two domains to evaluate his interpretations of information.

The librarian there gave me a folder of thousands of news clippings and, what I did, I tried to coordinate what she had said with what I found and get some sort of continuum on the situation, which basically I did. From there I went to a couple members of AA who had been around for twenty plus years and made sure that everything squared with what everybody was saying, [in the process] getting a little more detail and a little more perspective.

As interconnected as information sources appeared within and among the three resource domains, significantly, library research was not reported to have produced any referrals. Informal sources produced institutional and library encounters, and referrals to other informal sources. Institutional sources produced connections to other institutional sources and to informal sources. Library sources, however, were not reported as creating referrals to any other sources.

THINKING LIKE A SEARCHER

Learners characteristically reported that, as one individual said: "I have a lot of information in myself...." Typically, out of their experiences, students capably identified a compelling question from something in that situation which did not make sense to them. Then, "thinking like a searcher" (Rubens & Huston, 1989), they applied their existing knowledge about where information resides in society to the identification of appropriate sources of information. In their negotiation of informal and institutional information sources, learners generally reported capably navigating their ways through the labyrinths of those communication networks.

Speaking for most of the participants, one person said: "I found out from my research how much information you can obtain yourself." This was especially true for individuals who gathered information
from informal and/or institutional sources. Typically, they reported
highly informative, interactive experiences between themselves and
their informants. They reported making sense of the information
they received, often simultaneous with its transmission, as in the
case of their reports on interviews.

These information retrieval events were presented as "alive,"
"happening," perhaps due to the living, human nature of the
information providers (who were functioning, in effect, as
"interfaces" between the bodies of knowledge and the information
requestors). Or perhaps their enthusiasm was attributable to their
obvious familiarity with the informal and institutional environments.
In any case, the levels of comfort and confidence in their remarks
suggested that they felt "at home" in those environments.

While students largely reported on their strengths, two areas of
need emerged in data analysis—library and database research. In the
former, students expressed only qualified capability or actual
dissatisfaction in information retrieval. No one reported success with
CD-ROM or online information retrieval. Library and database
research were presented as the least familiar environments. Unlike
their accomplishments in the other two domains where researchers
seemed to feel in control, individuals typically expressed either
ambivalence or dissatisfaction about any but expertly guided retrieval
experiences.

CURRICULUM GENERATION THROUGH REFLECTIVE STUDY

The discovery that learners felt unable to navigate in library
environments provided the impetus for conducting a second study
of professionally trained academic researchers and, subsequently,
generating a textbook (Huston, 1988). As an extension of the classroom
conversations, Making Connections: A Guide for Thinking Like a
Searcher references the familiar as a bridge to the unfamiliar. The
instructional approach is described in the preface to the search guide
as follows:

This guide ... offers a simple explanation of how to apply your existing
knowledge for “making connections” to accessing information from
scholarly communication networks. To orient you to "thinking like an
academic searcher," I’ll introduce you in Chapter One to some of the
people who convinced me that our life experiences provide us with both
the raw material for generating provocative research questions and for
interrogating computerized database systems.

In Chapter Two you will read “insiders’” stories about the creation
of learned knowledge. You will learn, for instance, that instead of talking
over the proverbial “back fence,” as occurs in many local communities,
scholars exchange ideas across the lectern at conferences or through
articles in journals. In both cases, new meanings are forged through
the discussions. However, unlike personal conversations, scholarly
communication is frequently transferred to paper and this allows you
to access it in particular ways.
For instance, unlike the informative events occurring in the backyards of America, most of the phases of scholarly information creation are recorded in databases...and that is the subject of Chapter Three. By the time you read Chapter Three, you will have been reminded of what you know from searching for information among communication systems in your communities. You will also be familiar with the structure and function of the interlinking scholarly communication networks which produce published literature. The last chapter will suggest how you can combine your old and new knowledges in conducting successful online information searches. The material in this guide should prepare you for "thinking like a searcher" capable of "making valuable connections" with scholars' ideas.

BUILDING ON LEARNERS' EXISTENT KNOWLEDGE

This approach assumes that sensitive instruction to new users of computer-based information systems must acknowledge and enhance individuals' existent search knowledge if they are to develop conceptual understanding of the unfamiliar scholarly research process. It encourages information seekers to benefit from their previous experiences with information by recalling and restructuring their recollections, constructing new ways of categorizing them more appropriately for "thinking like a searcher."

More specifically, this approach presupposes that, for individuals unfamiliar with computers—or even the scholarship to which these retrieval tools provide access—explanations of human communication patterns and purposes can effectively bridge what they know from their own experiences to what they need to know about scholars' communication practices. First, information transfer is presented as a give and take process fundamental to both social and scholarly communication. Second, individuals, as members of both social and disciplinary groups, are represented as providing linkages between other individuals and their ideas.

When graphically represented, these information exchanges reveal networking patterns among members of various conversation groups. Establishing the similarities between familiar everyday conversations and not yet familiar scholarly conversations can create recognition among students of how, in a third way, scholars exchange information to create new ideas, just as through everyday conversations students' minds are influenced by exposure to new thoughts. Evaluation subsequently showed that such an approach enhanced novices' intellectual comfortableness and working familiarity with new technological applications for organizing, storing, and retrieving scholarly information (Huston & Oberman, 1989).
DISCUSSION

Individuals might have a number of reasons for engaging in information seeking. They might, for instance, wish to reduce ambiguity, or to increase their ability to cope with a situation, or to make a decision. Or perhaps they wish to find something that will lessen their anxiety or to move themselves toward some wanted goal. “Information is a tool, not an end” (Fine, 1984, p. 445). In other words, the search process involves information applications, not merely information finding.

Implicit in such a notion is the recognition that throughout the search process, information seekers construe and reconstrue the topic under investigation. By extension, then, the search process is, in itself, a process of construction (Kuhlthau, 1988) in which topics change and evolve.

Information retrieval, then, is both acted on by individuals’ states of thinking and acts of their states of thinking. In other words, external information from library sources are received in terms of individuals’ existing constructions of the topic—as it were, within his or her head. In turn, this new information causes an individual’s representations of a topic to change. From this perspective, users’ cognitive structures can be portrayed as systems that create, motivate, and direct searches for relevant information, even as they are influenced by external information.

In short, the search process is one of “sense-making” (Dervin, 1977). As individuals proceed, externally generated and internally generated information dynamically interacts. To make sense of the new information they encounter, searchers reflect “backward” to validate and move “forward” to illuminate. This dynamic process, which is inherent in “thinking like a searcher,” must be fueled through information education which encourages investigatory action through reflection.

CULTIVATING “THINKING LIKE A SEARCHER” IN THE CLASSROOM

In a participant-centered classroom, student learners must feel encouraged to operate from their own domain of experience, rather than moving immediately into that of the educators’ experience (Huston, 1983). Developing appropriate interpersonal relationships with learner groups (Huston & Enriquez, 1986) requires understanding of “how the phenomenological worlds of the students are constituted” (Bowers, 1984, p. 87). Only then is it possible to make explicit, important elements of the students’ tacit knowledge.

In introducing prospective academic researchers to the nature of scholarly discourse, for instance, a librarian might start with
examples derived from the students' own language environment. In Hawaii, reference to "talking story" when "folks" "go [to the] beach" would acknowledge the language environment of the local people there. In other settings, reference to talking across a white picket fence or chatting after Sunday church services might better convey how information is exchanged among conversation groups in students' neighborhoods and, analogously, among scholarly communities in academic disciplines.

Through encouragement and coaching, student learners can be enlisted in identifying examples of appropriate cultural references for moving from one language environment to another. Not only will this approach yield rich and varied examples but, by starting with the students' phenomenological world, instructors have a guide for aiming the discussion at a level at which student learners can relate verbal abstractions to the concreteness of their own life worlds.

This approach also communicates an important message to students about the purpose of the learning process. By taking the students' phenomenological world seriously, the teacher is saying, in effect, that the students' culture deserves serious attention. "This is a fundamentally different message than is communicated when the teacher ignores the students' culture and proceeds to dispense the new culture that is supposed to confer respectability and success" (Bowers, 1984, p. 87).

Student learners can also benefit from faculty learners' insights. Giving students the language for naming different aspects of their phenomenological world, for instance, enables them to be aware of what previously existed as part of their tacit knowledge. In the earlier classroom example, guest presenters used both historical perspectives and cross-cultural perspectives to illustrate varying approaches to studying a single topic. In appealing to students' personal involvement with the topic "images of Blacks," they illustrated how investigators' purposes influenced their discoveries. By example, they encouraged student researchers, similarly, to critically evaluate both human and paper information sources.

**Concluding Convictions**

These dimensions of empowering information education can have an infinite number of variations, depending on the intellectual and experiential backgrounds of both teacher and student learners. But any such reconceptualization of research instruction must be grounded in the recognition that the pedagogical manner in which information is transferred can both constrain and limit thought.

The dialogue which constitutes such "transformative education" (Shor & Freire, 1987) embodies creation and re-creation. As co-creators
in a conversation group, teacher and student learners alike "stimulate the other to think, and to re-think the former's thoughts.... Dialogue seals the act of knowing which is never individual, even though it has its individual dimension" (Shor & Freire, 1987, pp. 3-4). Inquiry, then, emerges from participants' natural curiosity, from their desire to know. It follows that motivation occurs inside the action of study itself, inside learners' personal recognition of the importance of knowing more (Shor & Freire, 1987). Rigor, then, develops out of inclusive communication which challenges others to take part in active inquiry.

Perhaps this is why so much traditional classroom instruction fails to motivate students. Students are not included in the search, in the activity of rigor. They are told the answers to memorize. "Knowledge is handed to them like a corpse of information—a dead 'body of knowledge'—not a living connection to their reality" (Shor & Friere, 1987, p. 4). It is in the act of trying to know and to re-know that learning occurs.

While the benefits of "pedagogy in process" (Freire, 1978) are substantial, so too are the investments necessary for the discovery of appropriate purposes and ends for specific population groups. Transformation of traditional teaching methods requires, first, an understanding of the social context of teaching. Then, instructors must create a situation where "the teachers and students both have to be learners, both have to be cognitive subjects" (Shor & Freire, 1987, p. 33) and "sociologists of information" (Parson, 1984, p. 372). Additionally, the convictions of all members of the classroom must be respectfully considered in determining curricular directions. And, lastly, throughout, the teaching/learning environment which can harness participants' tacit knowledge of "thinking like a searcher" must be infused with enthusiasm for the possibilities of inquiry.

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The Role of Affectivity in Instructing People of Color: Some Implications for Bibliographic Instruction

Patrick Andrew Hall

Abstract
In the area of pedagogical methods and their applications in teaching people of diverse cultural backgrounds, many curriculum models have been proposed by the academic community. Instructional models emphasizing a cultural specific orientation have been the most prolific. The underlying logic driving this approach has been the well founded belief that when we instruct people of color, it becomes important that we familiarize ourselves with their cultural experiences, and develop a pedagogy that is sensitive to cultural diversity. This article wishes to place an instructional addendum to the cultural specific model. What is germane in regard to pedagogy and ethnic minorities is not so much how, or even what, we teach. But the more intangible qualities of personal rapport and empathy play a vital role within the pedagogical paradigm. For those busying themselves with the issue of effective bibliographic instruction, the relationships developed inside and outside the classroom, or what is termed "affectivity" (Kleinfeld, 1983, p. 13), are perhaps the best pedagogy. Many of the observations presented in the following paragraphs come from personal experiences as both a secondary and college instructor who has taught such diverse groups as Yupik Eskimos, Cheyenne Indians, Mexican Americans, Javaro Indians of Ecuador, and Black Americans. Several cross-cultural and intercultural studies will also be cited including those of educational anthropologist Judith Kleinfeld.
Effective teaching is a matter of relationship. Whether relationships are built in intensive classroom communication or in informal advice given after class, we as instructors must be aware of capturing all the teaching moments that are presented each day. In regard to teaching people of color, those interpersonal relationships developed both inside and outside formal class time are imperative in creating an atmosphere where these individuals can best learn. The field of education in general, and bibliographic instruction in particular, have been prolific in proposing and implementing culturally congruent pedagogic models (Cornelius, 1978; Kleinfeld, 1979; Ogilvie, 1985; Nichols, 1986; Cargile & Woods, 1988; Delpit, 1988; Huston, 1989). Although the overall effectiveness of culture-specific methods has been more or less successful, it is this writer's contention that the less intangible element of personal rapport will best serve our goals.

As suggested in the opening abstract, an addendum must be added to the culturally congruent approach. We must not become so bogged down on finding that elusive "right approach." Instead, the focus should be to maximize contact with students. In an age when many academics have largely abandoned their classrooms to teaching assistants because of tenure pressures, overcrowding, and unfortunately, just some plain animosity toward undergraduates (Sykes, 1988), this is much to ask. But if there is truly a commitment to teach people of color, or anyone else for that matter, priorities must be reevaluated.

To interject, for lack of a better term, the term people of color will be employed when referring to Native Americans, Asians, Hispanics, and Blacks. Although the author is deeply aware of the inadequacies of such labels, nonetheless, it will underscore the main premise of this discussion that interpersonal communication and relationships play a far greater role in effectively teaching these groups than does any contrived culturally congruent lesson plan.
Once again, instruction that takes into account cultural diversity is still vital, but a teacher of people of color must realize the importance of having a personalized relationship with each student. The point is that the teacher must demonstrate, with conviction, that he or she really cares about the students as people (Nichols, 1986, p. 3).

Affectivity in the Classroom—An Elusive Goal

Sixteen years ago, as a new teacher at a predominantly Mexican American high school in Brownsville, Texas, this author was instructing a sophomore class in World Religions. Being new to the teaching profession, I was extremely excited about imparting all that I had learned of various religious belief systems. For many weeks, I diligently spent hours on lesson planning, and in my very best "teacher education don't smile 'til Christmas" pedagogic style, it was attempted to impart to these young people what was for me an exhilarating subject. After a couple of months it was noticed that very little of anything I had taught was being absorbed and in fact I was failing miserably in getting the information across to students.

One day I was tutoring a student in the library, and we were having a great time going over some material, and he inadvertently told me that I should "act this way in class." He had noticed that I had taken an interest in him as a person and wasn't so preoccupied with my material. In short, I had discovered the importance of relationships in the instructional process. As alluded to by M. Ramirez (1982) in his work on the cognitive learning styles of Mexican Americans, "who you are and how you behave is far more important than what you know" (p. 43). In the instructional environment, this translates into an instructor's willingness to go beyond just merely presenting facts. We must package curriculum within an "affective teaching environment."

Use of the term affectivity refers to those qualities of rapport, concern, empathy, and dedication coupled with high expectations that are imperative for instructors working within a culturally diverse environment (Kleinfeld, 1983). Although these qualities should be employed in any pedagogic endeavor, they are especially important for people of color, where relationships and person-to-person interplay are focal (Nichols, 1986).

The role of relationship and affectivity in the teaching process was indirectly cited in a lecture by Edwin J. Nichols (1989) given at The Evergreen State College's Tacoma campus. The focus of his talk dealt with the philosophical aspects of cultural differences and how variations manifest themselves in the way Europeans, Asians, Native Americans, Hispanics, and Blacks relate interpersonally. According to Nichols, Europeans' interpersonal relationships are
colored by a "Man-to-Object" paradigm in which the highest value lies in the object or in its acquisition. In the latter groups, Man-to-Man or Man-to-Group paradigms dominate. Interpersonal relationships or the cohesiveness of the group play a vital role. According to Nichols (1986), Europeans and non-Europeans have different axiological reference points, Man-to-Object versus Man-to-Man. The European focus on Man-to-Object dictates that the high value lies in the object or in the acquisition of the object. "Some of the things that could be classified as objects would be land, work, time, and so on. The significance of land as an object can be seen by looking at White farmers. Many of them are losing their land and their loss of object causes them to see themselves as devalued" (p. 2).

On the other hand, non-Europeans, although having a need for object, place their frame of reference in a person or group. The object, whether it be money, land, grades, or factual information gleaned in the formal classroom isn't the bottom line in life. Although Nichols's hypothesis can hardly be thoroughly discussed in this brief essay, and this author does have some misgivings about his identification of what constitutes European values, its pedagogical implications must be taken seriously. Generally, the teaching environment is based on a teacher or a professor transmitting "object A," which is the course content, to students via either note taking or seminar. As suggested earlier, the "don't smile 'til Christmas" instructional model, although being a bit facetious, does serve as an indictment against the interpersonal, low-affectivity style of teaching that dominates most university settings. It is this very style that can have disastrous effects on many minority students. To use black students as just one example, the conspicuous failure of black students to achieve academically is well documented (Miller, 1984; Cargile & Woods, 1988; Garibaldi & Bartley, 1988; White, 1988). In response to this failure, educational theoreticians have responded with a myriad of curriculum proposals and programs to address the situation (Gay & Abrahams, 1972; Brookover, 1982; Kochman, 1981). Although these proposals have met with some success, little significant impact will be made in upgrading black academic achievement until teachers develop higher expectations for these students and show that they really are concerned with them as individuals. Affective behavior is the key. If we look at the work of Marva Collins with supposedly low achievers (Shade, 1989), it wasn't any special culturally congruent instruction which motivated these students. Indeed, Collins uses very traditional methods with her students. What she has done is to develop a rapport with her students, while at the same time demanding from them high academic
excellence. Once again, relationship, manifested through affectivity and dedication, is more important than any prescribed pedagogic method. Whether a course integrated bibliographic instructional model is employed or some form of multicultural lesson plan, the success or failure of any curriculum depends more on what occurs in between the lectures or biolabs. It starts when time is taken before, during, and after class to give a little more of our energy to students. If we are serious about improving retention rates among minorities, some credence must be given to the role of affectivity.

Culturally Congruent Methodologies—Some Ambivalent Observations

In the preceding paragraph, use of the term multicultural education in favor of cultural congruency was purposely avoided in discussing pedagogic logistics. Although the latter is very conspicuous in the literature (Cervantes, 1984; Troyna, 1987; Bhola, 1988; Gill, 1988), coherent definitions of multicultural education are extremely tentative and, from an applicational standpoint, cumbersome to implement on the program level (Gibson, 1990). A multiple hurdle exists in the use of multicultural curriculum methods, one which points to an epistemological paradox. Can we develop instructional models that are general enough to be valid and specific enough to be useful? It is this author's contention that this question cannot begin to be answered until affectivity is interwoven into the instructional matrix. Although it might be painful for those who view multiculturalism as the educational panacea, many of its precepts may be counterproductive to its original goals of affirming cultural pluralism via pedagogy that is culturally sensitive (Gibson, 1984). Once again, the purpose here is to underscore the point that method and curriculum models are vital when instructing people of color; however, what is even more germane is affectivity. In Judith Kleinfeld's (1983) work with Native American students, and confirmed through this author's own field experience in teaching Yupik Eskimo high school students:

The critical question for community members is not what methods the teacher is using but the nature of the teacher as a person. The critical question is can we trust this person to care. Once villagers have decided the teacher is trustworthy, then they allow the teacher to make his or her own decisions about how to accomplish the job. (p. 18)

Multicultural teaching methods are indeed important and they represent steps in the right direction, but the shortcomings must be recognized. Margaret Alison Gibson (1984), in an excellent study on multicultural education, highlights some of its weaknesses. Although it is beyond the scope of this article to thoroughly present her arguments, the author recognizes the need to affirm and develop
an awareness of cultural differences and the role they might play in educational discourse, but she suggests that multicultural or congruent instructional models accept, without question, that cultural differences are the cause of minority groups' failures in mainstream schools. Thus, strategies that are generated from such assumptions view the problem as simply one of cultural discordance.

What should be added here is that developing the most eclectic pedagogy might not be the most fruitful way to proceed and in many ways can be quite dangerous when one gets into generating so-called culturally sensitive teaching methods. Too often we either fall into the trap of viewing minority groups in monolithic terms and do not consider the great amount of diversity within that group, or we build instruction around cultural practices that we do not or cannot fully understand. In this author's work with Black Americans, Yupik Eskimos, and Cheyenne Indians, it was found that it is best to be open to learning as well as teaching. It is imperative to have some familiarity with the cultural mores and folkways of these cultures, but our more serendipitous teaching selves should come to the forefront.

Whether teaching a formal class in bibliographic instruction, instructing groups in the use of the library collections, or conducting a reference interview, it is the relationships that are developed and nurtured that are critical. In the following section, the importance of relationships in teaching will be illustrated by outlining situations which gave rise to this author's belief that it is personal interaction and not necessarily method that will best serve our objectives.

**Relationship as Pedagogy—Some Field Experiences**

In this author's years as both a secondary and college instructor, a wide range of individuals was taught from various cultural and ethnic backgrounds. In the mid-seventies, I was a secondary instructor at a Yupik Eskimo boarding school in Andreafsky, Alaska. Also during the 1970s, I worked with Mexican American students in Brownsville, Texas. In my present position as bibliographic instructor at The Evergreen State College—Tacoma Campus, I teach a four credit research methods course entitled, "Research, Composition and Epistemology" to a largely black student body. In all of these experiences, although having employed many of the instructional ideas gleaned from various cross-cultural teaching courses and workshops, I have come to the conclusion that success was predicated not on specific application of any of these learned and often fadish methods. Success or failure was simply a matter of how well concern for students as people was communicated.
Now this is not to say that continual innovations are unnecessary in working with culturally different groups, or that we should downplay the role that multicultural educational methods play in addressing cognition variations among people of color. Indeed, as Barbara J. Robinson suggested in her book *Culture, Style and the Educational Process*, we live in a culturally diverse nation, where traditional education methods based on a white middle-class notion of cognition, are simply no longer adequate. Yet in my present position, I don't believe successes or failures were based solely on any particular instructional methodology. At Tacoma, a mixture of the four basic methods of bibliographic instruction are employed (Kazlauska, 1987), which are:

1. course-integrated bibliographic instruction,
2. bibliographic instruction seminar and the closely related bibliographic instruction workshop,
3. specialized bibliographic instruction within disciplines,
4. individualized instruction with emphasis on defined research projects.

Within a typical ten week session, a variety of methods may be used. I am also very much aware of allowing sufficient time to consult with each student individually, not just about their research but about anything that might affect their academic performance. Most individuals trained in the education profession may find this difficult since we are socialized to keep a certain professional distance. But it is this very distance that lends itself to low affectivism. In my work at the Tacoma campus, professional distance may be viewed as a sign of rudeness or contempt toward the students on the part of the professor. Despite the instructor's best intentions to the contrary, aloofness expressed through speech, lecture formats, or nonverbal behaviors can be detrimental when working with minority students (Erickson, 1979).

People of color do achieve better in situations where they can connect at some personal level with the instructor. The Tacoma students, as well as other minority students I have observed, have a need for interaction with teachers and their fellow students. Several studies have suggested that among Blacks, Native Americans, and some Hispanic groups, students are accustomed to learning associated with intense interpersonal interaction, as in a family setting (Gitters, et al., 1972; Hale, 1978).

Although the current library research class that I teach could be construed by an outside observer as extremely task-oriented, before, during, and after class throughout the year I put a great deal of energy into just getting to know each student. This often helps to tailor bibliolabs toward topics and examples that plug in to their
life situations. For example, as a part of a research course each quarter, two weeks are spent studying legal and government bibliography. Since the majority of Tacoma students are employed Black adults with families, discussions of such legal resources as the USCA, CFR, and state and municipal codes always involve such issues as child support, race and sex discrimination, landlord and tenant statutes, issues related to harassment by law enforcement officials, and many other topics. These same issues, which serve as the basis of the legal component of the course, are the same issues which are discussed in more informal conversations. They are life issues that are not generated from some contrived culturally congruent method but stem from relationships.

Alluding to my earlier teaching experience fourteen years ago in Brownsville, Texas, my basic mistake wasn't in method or preparation but in a lack of "affective" pedagogy. Similarly, it would have been disastrous to approach the Tacoma unit strictly from a theoretical construct which examines legal bibliography through some abstract discussion involving the evolution of case and statutory law. Taking the time and energy to establish some form of personal rapport with students, and especially minorities, is a far more effective way to promote learning than adherence to the labyrinth of learning and cognition theories dealing with instructing minorities.

As reiterated throughout this synopsis, culturally congruent learning theory is an extremely valid guide to preparing us to work with people of color. Cognitive theories examining such phenomena as field dependent versus field independent learning styles have helped this author immeasurably in being aware of the various ways people of color learn (Saracho & Dayton, 1980). However, within the classroom or in our roles as teachers on the reference desk, success invariably depends on how much we are willing to take the chance of letting affective qualities message the educational process.

During the late seventies, I was an instructor at a Yupik Eskimo high school which has received acclaim in the educational literature as a case study in effective bicultural instruction (Kleinfeld, 1979). One of my classes at this school dealt with world history, and I was teaching a unit on the Peloponnesian Wars. In Yupik culture, as in some other Native American cultures, the use of the story is an effective teaching tool. During this unit and others, I used personal experiences in teaching about intercultural squabbles. Since the Peloponnesian Wars dealt with the conflict between the ancient Greek city-states, sharing something about those conflicts I experienced as a young Black male growing up in the fifties and sixties was appropriate. The majority of the students at St. Mary's School came from the very small villages of Northwest Alaska, and their familiarity
with the western world, much less Ancient Greece, was practically nil. However, my personal biography served as a catalyst, and some of the students began to share their own stories about intertribal conflicts that existed in their own cultural histories.

One major area that these Yupik Eskimos were very emphatic about were stories that dealt with ancient wars they had fought with the Indian population when the Eskimo culture migrated across the Bering Straits thousands of years ago. It was quite fascinating to see these individuals develop an extremely coherent understanding of the wars between the Ancient Greek city-states through the simple sharing of personal stories. Those of us steeped in Western education methodology and semantics would do well to integrate narrative forms of pedagogy into lesson planning. As Kleinfeld (1979) noted in her study of St. Mary's High School:

St. Mary's was a village society with a structure of social relationships similar to the students' own communities. Students and teachers frequently visited each other outside the classroom. While I was interviewing St. Mary's teachers, even in their dormitory rooms, students continually pounded on the door, asking for help with homework or other matters. The kids smother you; they're always in your room, just sitting, touching your things, asking questions. (p. 30)

This intimacy in my personal experience at St. Mary's bred affection and relationship, which was carried over into the classroom, and which made the job as an instructor much easier.

To interject, I often feel that the real tragedy taking place in education in our country, and especially in colleges and universities, is that true teaching and real involvement with students is essentially discouraged (Sykes, 1988). Professors are promoted and rewarded not by how well they teach or inspire students but simply on what they publish or research. Of course this mind set is all predicated on the myth that good research makes good teachers, when in fact teaching develops good teachers. Until the educational community chooses to accept this fact and confront this developing pedagogical desert, which is called our undergraduate curriculum, all of us are at risk. Native Americans, Blacks, Hispanics, poor whites, and Asians may all feel the effects of low affectivism first, but all students are being cheated horribly by this lack of concerned and dedicated teachers.

Relationship is the key to effective pedagogy. In our work as reference librarians, interaction with people of color in a simple reference interview presents us with daily opportunities to educate and not just to direct. On a personal level, I have seen, far too often, professional librarians being extremely short with individuals who really need help in locating resources. And I can't help but think how many times this scenario is played out in libraries across the nation. As information professionals who are called upon to work
with people who have traditionally been the informationally disenfranchised of our nation—i.e., Native Americans, low income whites, Blacks, Hispanics, etc.—it is urgent that we recognize the role personal relationships can play in the administration of our duties as librarians, as educators, and more importantly, as human beings.

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Creating Hospitable Environments for Technologically Naive Users:
Y'All Come Back Now, Hear!

Susan Miericke

Abstract
Hospitably encouraging nonusers of contemporary information storage and retrieval systems relies on a synthesis of both intercultural communication and bibliographic instruction. More specifically, sound communication strategies must be employed to bridge interpersonal differences, and contextual teaching approaches must be developed for introducing systems' purposes.

Introduction
Information is to our age what coal and iron were to the Industrial Revolution. Increasingly, the data which fuels intellectual progress are being retrieved through electronic means. "It is easy to get the impression that the future of libraries and librarians depends on new technology. We read the predictions in the literature. We hear them at conferences. We budget more and more money. We plan our services based on them" (Schuman, 1990, p. 34).

In the early years of this information revolution, researchers' access to databases was mediated by librarians who knew the system command languages and search strategies and who conducted searches for information seekers. However, since the mid-1980s, major online services have aggressively encouraged end-user searching through changes in marketing tactics, such as placing advertisements in professional journals and exhibiting at trade shows and professional conferences. They have also created new services, including lower
cost evening access, simplified user interfaces, microcomputer “front-end” search assistance packages, and databases on Compact Disc-Read Only Memory (CD-ROM).

The Emergence of the End-User in the Electronic Library

Many visionaries (e.g., Meadow, 1979; Tenopir, 1987) have predicted that end-users eventually will take over the terminals. In fact, the number of end-users is increasing rapidly. For instance, in 1986, librarians constituted 85 percent of the holders of current passwords on DIALOG, a vendor for over 300 databases. Suggestive of the changing demographics of users, that year 80 percent of the 18,000 new accounts went to end-users (Summit, 1987)—i.e., individuals who search to satisfy their own needs but do not also search on behalf of others.

Other trends supporting the rise in end-users include the increasing access to personal computers and the rapid adoption of online catalogs in libraries of all types. At the same time, information seekers are being exposed to automated information retrieval through the CD-ROM products increasingly adopted by libraries and users alike. Since CD-ROM’s introduction five years ago, studies have consistently confirmed the popularity of this new storage and retrieval medium (e.g., Allen, 1989; Glitz, 1988).

Looking to the future, we can increasingly expect gateway interfaces to integrate information environments of the sort already available at the University of Southern California. Professional teams there have developed a hypermedia interface which provides students with access to the university’s online public access catalog (OPAC), selected bibliographic databases and reference tools, and associated academic courseware (Kinell, 1990). Additionally, employing an “Electronic Notebook” metaphor as an active research device, the common interface provides a personalized database, with outlining, copying, and note taking tools, and supports individuals’ interconnected information retrieval, selection, and utilization activities.

Appropriate to the “lifestyle of the autonomous learner in the information age” (Chignell & Lacy, 1988, p. 12), this integrated hypertext environment offers unique opportunities for even relatively naive users to “leapfrog” some of the tedious aspects of doing research. Thus users may focus from the beginning on the more substantive aspects of research, namely the evaluation and synthesis of information that are crucial to critical thinking.

These developments signify the changing nature of libraries. Through increasingly integrated online information systems, libraries are able to manage and interrogate both local resources and,
as well, to reach beyond the boundaries of immediate collections as gateways to other informational resources. At least one visionary has predicted that tomorrow's integrated library systems will be “at the confluence and convergence of computers and telecommunications” (Raitt, 1987, p. 479). Increasingly digitized and globalized libraries could become the “world brain,” capable of supporting worldwide, independent, individualized learning through electronic access to information.

Success in the contemporary information environment requires substantial knowledge. While both the procedural and conceptual fundamentals of retrieval success have received increased attention in recent years, little attention has focused on the reasons for initial uptake failures. Therefore, the subject of this article is the problem of nonuse of these value-added computer-based retrieval systems.

**New Patterns of Social Structure in an Information Society**

The problem of nonuse gains in importance as the information technology revolution is increasingly characterized by less expensive and more plentiful communication and retrieval technologies. As a result, information technologies have invaded not only the business office and the manufacturing plant, but also the home and school, and a multitude of public institutions.

Of course, “in an information society all people should have the right to information which can enhance their lives” (American Library Association, 1989, p. 1). Stated even more strongly, broad based “information literacy” is necessary for “survival...in the information age” (American Library Association, 1989, p. 6). Though clearly this is desirable, many questions exist as to how to best achieve this professional ideal of “service to all” (Trujillo & Cuesta, 1990) in our socially complex society.

At the same time, the importance of information access to personal empowerment is becoming increasingly apparent. As new means for creating, storing, distributing, retrieving, and using information are facilitated by emerging technologies and innovative applications, “information wealth” (Rice, 1987, p. 116) will interact with material wealth to create different kinds of social stratification. Appropriate information in an information society, then, can produce opportunities for those individuals with access and, increasingly, that depends on negotiating technology based systems.

This article will explore how to effectively encourage nonusers of contemporary information storage and retrieval systems through synthesizing insights from the literatures of intercultural communication and bibliographic instruction. Communication strategies for
bridging interpersonal differences will be presented and instructional approaches for introducing relevant content will be examined for their utility in introducing contextually diverse, technologically naive individuals to modern library information environments.

**Communicating with Individuals in a Pluralistic Society**

In recent decades in the United States, we have come to replace the notion of a melting pot with that of a mosaic. This shift in image has come about through the realization that full assimilation is not always desirable—even if it is achievable. Rather, ethnic and cultural differences in values and principles offer the potential for meaningful exchanges of overall benefit to the larger society. By implication then, interactions between nonusers and librarians could offer mutual insights into information-seeking patterns and preferences.

For the library as an institution to realize its unique role of ensuring that the larger society might enjoy the enrichment of multiple perspectives, it must "realize its potential as a cross-cultural bridge of humanistic sensitivity and compassionate understanding" (Stansfield, 1988, p. 551). This implies that, in removing physical, linguistic, cultural, economic, and educational barriers to opportunities, librarians must enhance learning experiences through meeting the informational, educational, and cultural needs of users (Mylopoulos, 1985)—both present and potential. Nowadays, as information is increasingly communicated by computer, this requires that librarians become involved necessarily in introducing nonusers to technology.

The pluralistic nature of our population creates serious challenges for professional information providers. Enlarging the job description of reference librarians and bibliographic instructors to include computer literacy places further responsibilities on their ever growing list of assignments—including changing printer ribbons and replacing printer paper, and troubleshooting computer equipment (Aluri, 1989). It also implies that they must be skilled in educating others about the usefulness of computer-based technology.

**Human Aspects of Information Technology**

A frequent source of confusion in discussions about information technology concerns the meaning of the term itself. Common usage usually equates technology with physical tools—particularly electronic devices—and their mechanisms of control—hardware and software. From such a perspective, technology is only discussed in mechanical and technical terms:
this perspective on information technology...fosters the notion that information, like data bits, is comprised of discrete units with the characteristics of physical commodities; it fosters the notion that information seeking, like electronic processing, is a set of procedures which can be formalized, followed, and taught as step-by-step sequences; it fosters the notion that tools, especially electronic ones, solve information problems and satisfy information needs. (King & Baker, 1987, p. 85)

Expert opinion challenges these common assumptions about the nature of technology. Technology, for instance, has been described as "the application of scientific and other knowledge to practical tasks by ordered systems that involve people and organizations" (Pacey, 1984, p. 6). This definition is in contrast with the common definition; this broader meaning envisions technology as the outcome of human endeavors which intend to achieve goals and fulfill needs using inanimate tools to help attain those ends (King, 1986). Such a perspective challenges the prevalent tendency to think of technology as machines isolated from their human purposes.

Realization of the enablement possible through usage of online technology requires, then, acknowledgment of the human contexts within which communication and information technologies function. Among the prevailing theories of information use is that human beings need information in order to reduce the ambiguity in their environment and that they use information to impose some structure on the events which constitute their world. Another theoretical view is that the world we live in is an orderly place, and information is a means to describe a portion of that order. Yet another perspective is that the world around us is random, and that we use information to reduce our sense of disorder so that we can cope with the randomness (Fine, 1984).

All of these constructs recognize that information seekers desire information for improved understanding. In this context, information plays a critical role in shaping perceptions of reality and behavior. Appropriate information, when used to educate, validates and extends people's experiences and mobilizes them.

In seeking information, people operate within an extended information environment. Variety in sources and resources characterizes the "information web," for instance, of fully networked scholars:

Scholars participate in many different information networks. In some of them the scholar acts as correspondent, in some as passive recipient, and in some as creator or initiator. The intersection of these many networks would be too complex to draw, but you can readily imagine what it would be like: perhaps like a galaxy of solar systems. The drawing would quickly lose any sense of a center even if you tried to draw only a few scholars and a few information providers (which might, of course, be other scholars). Rather than showing one center node intersecting
with many lesser nodes or "satellites," the drawing would have to depict many equal units sharing information on an equal basis. (Sack, 1985, p. 5)

Interlinking systems, then, provide wide networks of contacts which enable experts to become knowledgeable and remain current in their fields. As with person-to-person exchanges, through the exchange of information, individuals can gain improved definitions of both themselves and their ideas.

Ideally, the transfer technology is "transparent and open so that all the individual members need perceive is the information itself" (Sacks, 1985, p. 6). In practice, however, this is seldom the case, which makes all the more important the novice's understanding of the communicative purposes driving information creation and retrieval activities in both community and library systems.

The fundamental notion that communication drives information storage, retrieval, and transfer is essential, then, to nonusers' comprehension of the utility of such systems. To invite the uninitiated to enter into this dialogue, appropriate explanations must be presented in such a way that individuals understand information systems in the larger context of their own information universes (Huston, 1989).

**INTERPERSONAL DIMENSIONS OF EFFECTIVE INSTRUCTIONAL OUTREACH**

Reaching the currently unserved requires nurturing receptivity and willingness among individuals with the long term objective of increasing sensitivity and appropriate responsiveness on both sides (Stansfield, 1988). To accomplish this, you must "cultivate a professional humility" (p. 548). Librarians, as well as users, must assume the position of willing learners.

For instance, in initiating individuals to the culture of research and scholarship, with its particular behaviors, identity assumptions, shared philosophies, and traditional heritages (Kuh & Whitt, 1988), librarians can employ a respectful attitude of "turn taking." Novices, after all, are expert negotiators of cultural domains relevant to their everyday lives. An egalitarian attitude can set the stage for successfully transferring information about the culture producing the entities represented in databases, and create opportunities for learning about novices' cultures through empathetic listening (Rubens, 1976).

In today's world, where pluralism is more pronounced and elaborated due to social complexity (Goodenough, 1978), the bridging of differences is, admittedly, an increasingly significant challenge.
However, understanding the purposes for which technologies are employed and the purposes for which information is sought can provide the critical link between users, librarians, and sources.

**Concluding Reflections on the Problem of Nonuse**

For all of us, there is an ever widening gap between what we understand and what we find we must understand (Wurman, 1989). Because "information frustration and hence information anxiety results when you know what you want but not how to get at it" (Wurman, 1989, p. 6), "dis-ease" has become epidemic in modern society. The cure lies in part in the creative responsiveness of librarians who stand at today's automated gates to knowledge.

To further complicate matters, in this age of accelerated technological change, technostress complicates information access, as is to be expected by any apparatus with the amount of power and prestige granted computers (Brod, 1984). Without the confidence which comes from successful experience, many people are understandably hesitant to approach an automated system, including those increasingly found in modern libraries. Librarians, then, must approach potential end-users; they must proactively interact with them in their own environments and on their own terms.

With the realization that "knowledge is a rich amalgam of the knower and the known" (Frick, 1984, p. 265), not yet initiated individuals' receptivity and self-esteem can be cultivated. This is in keeping with a basic tenet of good instruction, for "teaching reaches beyond transfer of facts to include transfer of confidence in the learning environment" (p. 265).

Meeting the challenges of encouraging current nonusers to explore automated library systems can provide opportunities for mutual growth, improved sensitivity, and interpersonal awareness. In turn, these human dimensions possess the most potential for extending hospitality to contextually diverse, technologically naive individuals.

**References**


Meadow, C. T. (1979). Online searching and computer programming: Some behavioral similarities (or... why end users will eventually take over the terminal). *Online, 3*(1), 49-52.


Ethnography of an Alternative College Library

SARAH PEDERSEN, JUDITH ESPINOLA, MARY M. HUSTON AND FRANK C. MOTLEY

ABSTRACT

A fictionalized perusal of documents that an acting dean—let us call her Merriam Meade, anthropologist and member of the faculty—finds on the desk of her predecessor at the college library. This "ethnography" describes multimedia and interdisciplinary research services and programs offered at The Evergreen State College. Among the innovations for integrating library and classroom research instruction which have evolved in the college library's fifteen year history are job exchanges between faculty librarians and teaching faculty, staff taught courses and workshops, and a student centered philosophy of service. Although the memoranda are often real ones from everyday work, names are only occasionally those of the actual persons in current positions at Evergreen.

THE SITUATION AND SETTING

In Spring 1989, I participated in a one-quarter job rotation at The Evergreen State College Library. The faculty librarians here regularly rotate into full-time teaching responsibilities; during this particular quarter, the library dean was scheduled to teach at a branch campus in an academic program called "Health and Human Services."
I have taught anthropology at The Evergreen State College for five years and ten years prior to that had been an academic administrator at another institution. When asked to assume the library deanship for three months, I looked forward to the chance to sharpen problem-solving and management skills in a new setting. I also wanted an opportunity to see the library from the inside, to observe its operations as well as its collection, and I welcomed the chance to flee the field of anthropology for a short time. Nonetheless, it became impossible to escape applying research techniques to this new cultural setting. Settling into the new job, I remained the participant observer I had been in other research environments.

BACKGROUND

First, I found myself slipping into the ethnographer's role as I interviewed Dean Susan Perry before she vacated her desk. She reiterated some basic premises about the library: that unlike some of its counterparts on other campuses, it takes the lead within the college in integrating information sciences and communication arts into the interdisciplinary curriculum; that its staff is committed to teaching students to access, evaluate, interpret, and create information in all media; and that library personnel includes teachers with a variety of disciplinary specialties and degrees.

Such facts at first suggested normality to me. Didn't they describe any college library as it should be? Then I reflected on differences observed among other educational "cultures" and The Evergreen State College. The academic focus of the college is on what has been called "student-centered education"—education which centers on the needs of the student rather than on those of the instructor. In the attempt to practice student-centered education, Evergreen generally avoids departmentalization, tenure systems, lecture courses, and even the reserve book room. A written evaluation system replaces the more traditional grading system. Evergreen experiments with ways to empower students to find, analyze, and interpret information independently. Evergreen is also committed to providing the highest quality education to a wide and diverse group of students. The institution considers the progress each individual makes while in college to be of greater importance than how high his or her SAT entrance scores might be.

Having reminded myself how different the college was from its academic counterparts, I investigated how the library might be affected by the difference. The most intriguing aspect of the library is the teaching, which is a direct or indirect function of an unusually high percentage of the staff members who successfully apply the tenets
of Evergreen teaching philosophy in their instruction. My playful research question became, then, how are instructional activities made manifest in this library, and what cultural premises do they presume?

FIELD WORK

I asked Dean Perry to allow me to practice some selective observation. She left a number of previously written documents and memoranda about the library’s teaching function on her desk. The following pages reveal the materials found there a week later when I began my rotation into the Deanship.

The first documents were on the faculty rotation process—i.e., the faculty membership obligations of some librarians and an evaluation of work by one librarian when she taught in an academic program in the health field:
develop library programs appropriate to academic needs. Simultaneously, students studying with faculty librarians have developed a new perspective on librarians' (and the library's) role in the educational process.

The Evergreen State College
April 25, 1989

COLLEGIAL EVALUATION OF MARY HUSTON

Willie Parson, Member of the Faculty

Let me begin by saying that I have enjoyed our time teaching together in Human Health and Behavior and continue to enjoy our association since your departure from the program. From the outset, you have brought a deep sense of commitment to your work in the program. Students have been quite perceptive of your genuine excitement by, and interest in, the ideas and substance of the program. Thus, they have responded to you by demanding more of themselves than perhaps might have been the case had you not been there. I saw a number of students really come into their own as a consequence of your efforts to encourage and inspire them to reach new levels of achievement.

I believe you did a wonderful job of designing, implementing, and conducting the research and critical reasoning workshops. Your work in this capacity has resulted in our having a program more or less full of students who really know how to conduct research, how to articulate a thesis, and how to develop critical and cogent arguments in support of their theses. Certainly not everyone does each of these things equally well, but everyone has developed the foundations for doing research and argumentation at a level befitting an advanced student in the social sciences.

I have valued your participation in our faculty seminars. I think you bring a clear perspective into our discussions that is informed by your concern for people, your interest in substantive ideas, and your continual development of new knowledge. You are constantly on the lookout for new and exciting ideas and this manifests itself in our seminars through the questions you raise and the stimulating insights you offer. This has had significant impact on me. For example, I have taken an active interest in the sociology of knowledge and in the matter of writing (and rewriting) of history all because of ideas you have brought into seminars. I look forward to our association in the future.

Best,

Willie
A taxonomy of different teaching situations for the library staff began to emerge. I had learned from other informants that in addition to teaching outside the library, faculty librarians and staff from the library teach internships, individual contracts (or independent study), and about six formal, credit-generating courses in research and media within the library, all of them designed to supplement the more standard academic work. The various modes of instruction were outlined in a letter, which was followed by an example of a student’s evaluation of a librarian’s teaching.

Enclosed is the survey data you requested for your doctoral study of library instruction. In your cover letter, you encourage respondents to elaborate on their answers. I would like to do so, since my answer may be misleading without further explanation. You may be surprised to read that the library staff at Evergreen generated approximately 2,002 academic credits in the past year. We generate credits in two principle ways: by sponsoring individual contracts and by teaching credit-generating courses. Individual contracts are a form of instruction at Evergreen which allows advanced students to design their own courses of study and to work largely independently with weekly meetings with their faculty sponsor. A partial list of the individual contracts we sponsored in the past year will demonstrate the wide range of expertise of our staff.

<table>
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<th>SPONSOR</th>
<th>CONTRACT TITLE</th>
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<th>QUARTER</th>
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<tbody>
<tr>
<td>Randal Barbara, Photographer II</td>
<td>Images of Nicaraguan Culture: A Photographic Documentary</td>
<td>16</td>
<td>W</td>
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<tr>
<td>Marge Brown, Media Supervisor</td>
<td>Advanced Film Animation</td>
<td>4</td>
<td>W</td>
</tr>
<tr>
<td>Sarah Pedersen, Cataloging Librarian</td>
<td>A Bibliography of Cross-Cultural Child Development</td>
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</tbody>
</table>

The Evergreen State College

August 16, 1988

Ms. Celia Black
1001 16th St. NW
Washington, DC 20036

Dear Ms. Black:

Enclosed is the survey data you requested for your doctoral study of library instruction. In your cover letter, you encourage respondents to elaborate on their answers. I would like to do so, since my answer may be misleading without further explanation. You may be surprised to read that the library staff at Evergreen generated approximately 2,002 academic credits in the past year. We generate credits in two principle ways: by sponsoring individual contracts and by teaching credit-generating courses. Individual contracts are a form of instruction at Evergreen which allows advanced students to design their own courses of study and to work largely independently with weekly meetings with their faculty sponsor. A partial list of the individual contracts we sponsored in the past year will demonstrate the wide range of expertise of our staff.
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<th>Name</th>
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<tbody>
<tr>
<td>Lucy Enriquez</td>
<td>Documents Specialist</td>
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<td>F</td>
</tr>
<tr>
<td>Bob Haft, Slide Curator</td>
<td>Study and Recording of Otter Behavior through Underwater Photography</td>
<td>16</td>
<td>F</td>
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<tr>
<td>Mary Huston, Reference Librarian</td>
<td>Idea Tactics for Interdisciplinary On-Line Searching</td>
<td>12</td>
<td>W</td>
</tr>
<tr>
<td>Peter Randlette, Electronic Media Producer</td>
<td>Experimentations in Electronic Music Production</td>
<td>16</td>
<td>W</td>
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<tr>
<td>Ernestine Kimbro, Reference Librarian</td>
<td>Paradigms for Science</td>
<td>16</td>
<td>W</td>
</tr>
<tr>
<td>Susan Perry, Library Dean</td>
<td>Explorations of Social Psychology through Women's Literature</td>
<td>8</td>
<td>S</td>
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<tr>
<td>Char Davies, Head of Electronic Media</td>
<td>Advanced Video: Psychology and Production of Commercials</td>
<td>4</td>
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To give you a better idea of the nature of contract work, I have included excerpts from Mary Huston's evaluation of one student's contract work during spring quarter 1982.

The genesis of Karen Kamera-Gose's work this quarter was her recognition that "the multitude of descriptors and databases that can be used in interdisciplinary searching demand powers of conceptualization and synthesis beyond the requirements of a single discipline search." Although computer-based literature searching has existed for two decades, the first article on interdisciplinary searching did not appear in the professional literature until 1978, and no empirical studies on the process have been done to date. Karen's project, therefore, is a pioneer effort...her assistance model for searches is designed to facilitate interdisciplinary search queries...it enhances our multidisciplinary thinking abilities, and reminds us to use those facets of the searching software that lend themselves to interdisciplinary searching. Dr. Mignon, professor at the University of Washington, described her findings as "a dynamic, sequential theoretical model." A paper summarizing her work-to-date has been accepted for presentation at the National Online Meeting in March 1982, New York City. Entitled "A Facilitation Model of Idea Tactics for Interdisciplinary Searches," the paper draws from cognitive psychology in suggesting models for interdisciplinary database searching.

The quality of her ideas leaves no doubt of her capability for significant original work. Among the intellectual abilities that I observed in her work this quarter were the capabilities for analysis, abstraction, and synthesis, and written and oral communication. These strengths were evidenced in her facility
for synthesizing disparate ideas from multiple fields and applying them to yet another field. She cogently articulated her interim hypotheses in weekly discussions and, in her final manuscript, brilliantly reviewed the theoretical underpinnings and empirical findings of her research.

Through independent learning contracts, we generated 374 academic credits in the past year. In addition, we regularly teach more traditional group courses. “Media for the Uninitiated” is offered three quarters a year, as is “Audio for Media”; “Portable Video” is taught once a year; “Photography I”, “Photography II”, and “Photography III” are offered sequentially each year. “Library Research Methods,” on the other hand, is taught primarily through integration with program content.

Research methodology courses are taught at the Vancouver campus each quarter and at the Tacoma campus once a year. These courses generate approximately 1600 credits annually.

At the Evergreen State College, then, library instruction is very broadly defined. We are involved in both the production and retrieval of information and staff are encouraged to substantively utilize and extend their expertise. I hope this explanation offers you a sufficient sense of the context in which I have generated the data for your questionnaire.

Sincerely yours,

Pat Matheny-White
Reference Librarian, Member of the Faculty

The Evergreen State College
STUDENT EVALUATION OF FACULTY

Frank Motley
Faculty Name

March 1988
Date began

June 1988
Dated ended

Library Research Methods
Program or Contract Title

During this quarter’s “Library Research Methods” Class, Frank escorted us through the library with the same enthusiasm as a host opening his home to invited guests. Our class lecture time was well prepared and informative. I really enjoyed the slides presentation; discussing the contents and format of each source prepared us for its use, and open discussion was
encouraged. I used discussion as a time to ask questions about how to use the sources for my project, and it was also interesting to hear about other students' projects. Frank was also available after class during "lab" to help us with the actual sources.

I appreciated the freedom to choose my own project question and set my own pace. My bibliography question was not only interesting because I chose it, but I also saw value in the time spent because I used the research for another class. The requirements of the bibliography project improved the quality of my research and broadened my perspective of the subject. I discovered sources which I never before knew existed!

Student's Signature

Margaret Files 06/02/88
Name Date

The following documents demonstrated how library workers promote media literacy and integrate research skills instruction into interdisciplinary courses and programs taught by the college’s full-time faculty.

The Evergreen State College

November 17, 1988

Judith Espinola, Coordinator of Media Services
Library 1501

Dear Judith:

I want to thank you once again for the excellent series of media workshops you and Wyatt Cates conducted for the Political Ecology program last spring. The proof of the excellence of the workshops was the final results: five good slidetape shows of various study areas. All reflected the signs of
inexperience, but the process of developing the shows helped the students synthesize—indeed visualize—the biological, historical, and political material in a unique and enlightening way.

Based on my experience in the workshops and with the students, I would urge all faculty members to consider how they might work media presentations into their programs. I would also recommend that faculty work directly with the folks in Media Services while their students are so engaged. Direct faculty participation adds that vital link between a media component and the other activities of a program.

Regards,

Tom Rainey
Member of the Faculty
A Message for You

TO:  
DATE: 4-25-89
TIME: 2:30

FROM: C. Duckworth

MESSAGE:

Wants to know whether you would do your business at the Twin Palms Leisure or not.

A Message For You

TO: John Crosby, Bookkeeper
DATE: 4-16-89
TIME: 10:15

FROM: J. Nelson

MESSAGE:

Can you reach handwriting to some of his students this face? Should this be a learning contract?

A Message For You
The Evergreen State College

Syllabus of Media Workshops for the Program

MASS MEDIA AND POPULAR CULTURE: Winter 1989

Instructors and Speakers

Ginny Ingersoll, Member of the Faculty
Judith Espinola, Coordinator of Media Services, Member of the Faculty
Wyatt Cates, Head of Media Production Center
Char Davies, Electronic Media Producer
Sunny Spiedel, Student
Anne Stadler, Producer, KING-TV.

January 4
Lecture: Overview of Media Workshops
Lecture: Writing for print vs. non-print
Seminar: Public affairs radio programming
Radio Interview assignment explained
Group discussion: Interview Techniques
Assignment: Work in groups on radio
assignment Research topic
(off-campus interviews)
Arrange interviews

January 11
Lecture: Recording and editing for radio
Lecture: Introduction to Media Production Center
Assignment: Complete interviews for radio and edit into 3-minute stories

January 18
Lecture: Editing video
Explanation about portable video proficiency testing
Discussion: General critique of radio pieces
Division into groups for TV editing exercises
Assignment: Pass proficiency for video equipment
Meet in groups and discuss aims and subjects for interviews
Practice video editing in groups
January 25  Critical viewing of exercise: Comparison  of three new programs  An intern's view of public affairs at  KING-TV Assignment: Complete video exercise
February 1  Critique of video exercises  Interviewing for television:  Discussion and demonstration Assignment: Arrange interviews and prepare for interview
February 8  The look of TV: Studio production  Interviewing live vs. interviewing for tape Assignment: Shoot portable video interviews

Apparently, such instruction is not without problems. The next memoranda suggested some of the tensions caused by the heavy teaching role of the library staff.

The Evergreen State College
March 13, 1989

MEMO TO: Susan Perry
FROM: Judith Espinola
SUBJECT: Information for Deans' meeting next week

Susan, here are some thoughts for your discussion at the next meeting of the Deans' group. Do let me know if you have further questions.

We in Library Media Services supply much of the college's instruction in media. While we do a good job with aspects of such instruction, our emphasis is usually on the craft of media production. We teach about the aesthetic capabilities of equipment; we do not teach philosophy of aesthetics.

Our work is well integrated into nonmedia programs where media skills are taught in workshop formats to encourage further the interdisciplinary instruction and experiential education already inherent in a curriculum area. However, media skills cannot supplement theoretical, academic work in communications or the arts, if such work does not exist. Students would not be encouraged to do audio work, for example, without appropriate backgrounds in music theory, criticism, and composition lest we train technicians at Evergreen in spite of our desire to do otherwise.

As it stands, faculty and administrators at Evergreen are sometimes too dependent on us to fill a teaching gap we are not necessarily qualified to
fill. Sometimes we have to nurse students in contracts with faculty not truly qualified to supervise and advise on film, audio, and video projects. We do this out of concern for student needs and do not always consider the administrative ramifications of such decisions.

In short, we do a lot of formal (credit-generating) and informal teaching, but I sometimes think that what we do is integrated into the larger curriculum in a somewhat piecemeal fashion. We need clarification of the extent to which we should be teaching, what kinds of teaching are appropriate for us to take on, and how dependent faculty can and should be on staff for teaching functions.

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The Evergreen State College

April 15, 1989

MEMO TO: The Library Group
FROM: Malcolm Stilson, Head of Reference
SUBJECT: Faculty librarian responsibilities

I become extremely agitated when I hear complaints from the Library Group members who feel that the faculty librarians are not in the library and available enough. I'm an employee on a twelve-month contract. I have to cover the reference desk whenever the faculty librarians are somewhere else. I don't have faculty status; I'm often here more than 40 hours per week; I know what kind of frustration you feel when trying to locate one of our wandering librarians. But you should never think that because you can't find them, the faculty librarians aren't working. They are working, and they are working for us. The faculty librarians’ responsibilities include the important role of liaison with the rest of the faculty and the instructional part of campus. Without the liaison function, we cannot, as a library, do our job effectively. Constant interaction among the library, the librarians, and the rest of campus is essential to the ability of this library to serve the unique requirements of Evergreen instruction.

Among the activities which draw faculty librarians away from their desks are faculty seminars. In these weekly seminars, teaching faculty and librarians discuss topics relevant to the programs the instructional faculty are teaching. For two hours a week, these small groups of three or four faculty members attempt to ensure a high level of discourse, gain inspiration for class seminars, and generally keep the mind alive. The librarians not only keep abreast of what is happening in the classroom, they also reinforce their collegial relation with the faculty, gain insight into the instructional methodology of the college, get ideas and inspiration for their own instructional activities within and outside of the library, and receive insights on collection and service strengths and weaknesses. Preparation for seminars has to happen during off hours.
The formal liaison program also draws librarians away from the library. The instructional faculty are divided up among the faculty librarians so that each librarian is responsible for twenty to thirty faculty members. The librarians determine the workshops and collections needs of the faculty member and his or her programs. The liaison work also includes proselytizing for library service and making sure that instructors utilize the instructional programs of the library. The collection development aspect of liaison work is extremely important. Since Evergreen has no academic departments, there are no separate departmental budgets for ordering library resources in any particular discipline. Library subject specialists have almost complete responsibility for collection development and acquisitions. Without extensive consultation with faculty and without paying close attention to curriculum planning and faculty concerns and interests, the librarians could develop collections which were completely unsuitable to the instructional programs of the college.

The results of liaison work are evident in the number of workshops offered. Workshops are tailored to meet specific program needs and the workshops frequently employ Evergreen-style nontraditional pedagogy. In the last academic year, the reference librarians did 103 program-related workshops (as opposed to tour-like general workshops) involving 172.75 hours of instruction and reaching 1,478 students. The Media Services area had major involvement in six programs in which students did productions incorporating research related to their programs.

Additionally, several of the faculty librarians each quarter work intensively with one coordinated studies program to integrate several credits of library research into the program content. The effect is to assure that library research becomes an activity intellectually linked to program content. This assures that library research is not misunderstood as a skill involving a few basic invariable steps applicable to any subject or student or discipline. It also increases the likelihood that students will absorb more of the practice of research as they do research on their actual course content.

It is not the librarians' job to sit at a desk and suffer others to come unto them. Even during reference service times, the librarians ought to be roving the area looking for befuddled patrons. So please recognize that working librarians are more likely to be up, out, and about than sitting patiently at their desks waiting for you to come looking for them.

The relationship between the library and the academic life of the college was becoming more, rather than less, complicated for me. A memorandum on teaching strategies showed that the complexity was a reflection of the depth of involvement in instruction by the library staff, an involvement which embroiled library staff in pedagogical debate and soul searching.
MEMO TO: Pat Matheny-White  
FROM: Mary Huston  
SUBJECT: Issues of Teaching Philosophy and Content

Having just finished teaching the library research course this quarter and having begun preparation for teaching the comparable course at the outreach campus next quarter, I find that some issues have surfaced to which you might wish to give consideration in your plans for teaching the research course next quarter. Are we giving students the tools they need for survival in our changing world by offering them culturally relevant skills and concepts which will build critical reasoning and problem solving abilities? Are we in fact adequately addressing the campuswide commitment to enabling students? Are we empowering them to participate throughout their lives in decisions which affect them?

The following notes by Susan and me about our teaching experience in the outreach program in Tacoma last year discuss the modifications made in teaching “Empowerment and Information” to a largely Black student body. The modifications were made in an attempt to answer some questions about empowerment.

We are convinced empowerment of students through information instruction requires our reassessment of professional assumptions about education. Our philosophy developed as we taught a class of primarily urban Black adults in the Tacoma outreach program, but we feel the principles are transferable to developing any good teaching environment. Deviating from our usual approaches, we used the students’ cultural references (rather than our own) as a context for information instruction, an approach which emphasized students’ strengths rather than our own. We were well informed before and during teaching by the director of the program who had intimate knowledge of the backgrounds of each of the forty-five students. Additionally, student ownership of the education experience was encouraged by our repositioning ourselves: librarians and students worked together as resource persons striving cooperatively to make sense of cultural experiences in a bibliographical context. We achieved this by giving up traditional teaching methods and participating in the Black oral learning style used in Tacoma classrooms.

I believe that Susan and I appropriately recognized that the adult Black students required a nonconventional teaching approach. We need to similarly reconsider instruction in the main campus where we have a predominantly White, but increasingly heterogeneous, student body. In our regular library research course, we have resisted operating from any instructional
point of departure other than the bibliographic one. We explain research strategy in our terms, according to our subculture as it were. We say that there is a publication cycle. This line of thinking makes real sense... to us. But it is not a conceptual framework that comes naturally to the uninitiated, nor is it a particularly interesting way for the uninitiated to think about information initially.

The Tacoma experience suggests that we might productively offer culturally based explanations of how information is generated and share the position of expert with students. As we give up some of our power, students gain more influence in directing their own course of study. With such an approach, information would not be categorized in terms of bibliographical organization but in terms of the sectors of society and human enterprise from which information about different subjects, packaged in different formats, arises. Such pedagogy has the clear advantage of grounding instruction in the students' experiential and topical conceptual frameworks.

We must also integrate critical thinking and information evaluation into our instructional program; students must be taught not only to find information but also to "read" it. Even in the Tacoma course, where we recognized the link between empowerment and information in the title of the course, we did too little to emphasize to students that the library can be used to evaluate information as well as to find it. The resulting message to students is undoubtedly that finding information is the important thing, not assessing it. As recently stated: "Somehow, in our preoccupation with library procedures, we have ignored the reasons for searching—to learn, to make informed decisions, to evaluate applications of knowledge, to find truth" (McCormick, 1983, p. 339).

My field work had not quite prepared me to expect the following kind of communication from a library administrator to a long-time faculty member, but its facts and the premises which the participants shared seemed to summarize well the role of this library in its larger cultural and academic scene.

The Evergreen State College

November 22, 1988

MEMORANDUM

MEMO TO: Kirk Thompson, Member of the Faculty
FROM: Susan Perry, Dean of Library Services
Kirk, I decided to clean out some old files. Lo and behold, I found a memo which you wrote to Char Davies in 1975 entitled “Zen and the Art of Media Instruction.” In it you react negatively to a proposal which Davies wrote as the Electronic Media Producer about the possibilities of offering media workshops by library staff. Apparently, he repeated the phrases “media tool use and technique” and “basic media tool literacy” throughout the proposal. You responded to the implications of such usage and argued that such a literacy cannot exist any more than “grammar literacy” or “typewriter literacy” can exist. You argued persuasively that liberal arts students such as those at Evergreen “must learn to be shapers of the messages which the media deliver, rather than just functionaries in the delivery system, and that we must present this viewpoint right at the beginning, because it is all too easily submerged beneath a superficial fascination with tool use and production technique.... Media instruction must focus on having something to say and on saying it well.”

Many years later your words and warnings are still worth keeping in mind. Instruction from library staff has increased and infiltrated most programs on campus. Media and library literacy are spread with evangelistic fervor (when we’re up to it). How are we doing in integrating the techniques with the messages to be shared? Ideally, though techniques-centered, our teaching is well-coordinated with the subject content, themes, and goals of each academic program with which they are meshed, not dropped willy-nilly into classes as space fillers.

Getting there is often difficult, of course. For instance, you can teach students about the uses and misuses of journalism in our society by discussing theory and facts with them. But a truly rich understanding of the impact of journalism, whether television or paper journalism, necessitates experience with the tools of the medium. How much better will their understanding of media be if they have a significant hands-on experience editing film and doing journalistic research? They can really understand, in the most experiential sense, the process of shaping and changing information. Conversely, one can teach students the techniques of searching indexes for an assigned topic, but how much better will comprehension be if students research information that they truly need to know, so that content drives the learning of technique. Let us not underestimate how well an understanding of technique can affect the nature of the message produced. Surely you are (were) right in insisting that we not function as a hardware store. In order to avoid such a destiny, faculty and library staff need to work together to ensure the proper wedding of content and technique in accessing, evaluating, and communicating information in all formats.

In short, I think it is as much a mistake to eschew the importance of skills learning as it is to ignore the primacy of content. We in the library are trained in the techniques of media production and information gathering; we must work closely with faculty to ensure the quality and vitality of the content involved.
EPILOGUE
When I rotated out of the Library Deanship three months later, I left a new document on Perry’s desk:

The Evergreen State College

Susan—

Please call me when you get back this week and we’ll have lunch. I’m anxious to share with you the pleasures and pains of doing your job for the past three months. (I’m glad I did it! I’m glad you’re back!)

I now know how to use the resources of the library fully, you’ll be pleased to learn, and see in a new way how to integrate them into my instruction. THEREFORE, may I make a formal request for the “Origins of Sexual Inequality” program which I’ll be teaching with Stephanie Coontz next fall? I have talked with Pat Matheny-White who has agreed to join our team to integrate library research methodologies into the program content. She will join our faculty seminar, provide library instruction at approximately two hours per week, design, with us, a research project coordinating her instruction with program content, and, finally, provide occasional lectures related to her area of subject expertise.

Additionally, I’d like the students to use media to communicate their research for special projects. Judith could teach them writing for media; Woody Hirzel could teach basic photography for documentation; and Wyatt Cates could teach slide/tape production. If they can work closely with the students along with me, it will probably take three hours a week for eight weeks.

I know all this will end up being a substantial part of our program, so I’ll promise to do some collection development in anthropology in return. Fair enough?

See you for lunch.
Send for a Child of Four! or
Creating the BI-Less Academic Library

MICHAEL GORMAN

ABSTRACT
The author argues that libraries should work to decrease, and eventually eliminate, the need for bibliographic instruction (BI) by making libraries and library systems far easier to use than they now are. He describes the nature of such libraries and systems in the future.

LIBRARY INSTRUCTION
Many of the nicest and best librarians I have ever known are deeply involved with Bibliographic Instruction. They practice BI, read and write about BI, and attend colloquia on BI. It seems that, to some, BI is librarianship. This author would like to suggest that there are many things wrong with such an idea and that the "traditional" concept of BI is flawed fatally. Let us start with the name. Are all the well-meaning and idealistic librarians who seek, by various means, to teach students to use college and university libraries really instructing them in bibliographic matters? It is obvious that, if a student is to learn to make the maximum use of a library, she or he will have to possess some elementary bibliographic knowledge even in the rare instances when the library has "user-friendly" catalogs and other means of access. In the majority of libraries, she or he will have to know something of the complexities of abbreviations in catalog entries, the wildly varying citation practices of indexing and abstracting tools, and the nature and meaning of the links between bibliographic entries and the materials themselves. In short, she or he will have to be able to vault some of the many bibliographic hurdles that make up the obstacle race
that libraries force on their users. There are, however, other things that go into using libraries effectively—nonbibliographic matters, simple and complex, of which the student must become knowledgeable. For this reason alone, "traditional" BI should be renamed library instruction (LI), that BI should become LI, and its practitioners, should they wish, may call themselves LIers.

**Removing the Barriers**

The history of progress in librarianship is a history of the removal of the barriers that exist between the library users and the carriers of knowledge and information that they seek. Such phenomena as open stacks, public catalogs, online systems that permit remote access, and many others are all, when seen plainly, the result of the process of removing the librarian as mediator and of devising systems that the populace can use on their own, in theory at least. (The theoretical nature of some of these efforts can readily be seen by anyone consulting a prehistoric card catalog in a major academic library.) There has been much huffing and tut-tutting about the way in which college and university library users have embraced the People's Choice—the indexes on CD-ROM devices. It is felt that the hapless user, untrained as she or he is in the intricate "strategies" involved in online searching, will do incomplete or otherwise flawed searches. In short, that the hoi polloi cannot be trusted to know what they want or ought to want. There is something terribly nannyish about that attitude. If the bulk of users are satisfied with the results that they have obtained, sound utilitarian principles should tell us that CD-ROMs are good. As librarians, we should be rejoicing in the fact that technology has brought us systems that are so well received and so heavily used. This is not to say that most CD-ROM services could not be improved in such a way as to produce better results for their users, but merely to observe that the best systems are those that can be used by the reasonably intelligent, if uninstructed, user. Here we come to the heart of the matter. Many BI programs owe their existence and success to the "user hostile" nature of the systems about which they teach. Replace those systems with others that are truly "user friendly" and the whole purpose of the BI program is called into question.

**On Doing Away with BI**

It was hoped that this article would be anchored to the many writings on BI in the last decade or so and, to that end, I read a large number of articles and conference papers in this area. Though they vary wildly and often disagree with each other with some vehemence, this author was unable to locate any papers that contend,
as this one shall, that the efforts put into BI should be directed toward making BI unnecessary. It is interesting to note the parallel with writings about online reference services that concentrate on improving the nature of the librarian's mediation efforts rather than upon working with the peddlers of such systems to make mediation unnecessary. They are unlike the writings on, to take an example, bibliographic control. The body of the latter contains many examples of papers that argue, for example, that detailed cataloging is a waste of money; that broad classification is better than close classification; that the world would be better off without the Library of Congress List of Subject Headings; and that the syndetic apparatus of the catalog costs far more than its meager benefits justify. Why is it that the writings on bibliographic control embrace heresy and even papers that question the very need for such control, whereas the writings on BI appear to be based on the idea that BI is a transcendent good and, therefore, simply discuss the best means to carry it out?

One answer lies in the time that the two areas of librarianship have been in existence. Bibliographic control has been a mature and organized part of librarianship for many decades, whereas, although library instruction has always existed in the practices of individual academic and college librarians, BI as an organized part of academic librarianship is a relatively new phenomenon. Something practiced in large numbers of libraries for more than a century is bound to produce its share of failures. Those failures, in the case of bibliographic control, have been both numerous and of far-reaching and readily perceived effect. BI on the other hand has not had the time to produce spectacular failures, and more importantly, such failures as there are have been largely invisible to both library users and library administrators.

Another answer lies in the fact that BI was, in many ways, conjured into existence by the very failings of bibliographic control. It is not too extreme to state that BI is a prominent concern in academic libraries because, to lash out even-handedly at the public and private sectors, the large card catalog has been an unmitigated disaster, and many indexing and abstracting services are horribly difficult to use and yield, even when they are findable, incomprehensible results. BI librarians are to library users what nurses are to hospital patients, coaches are to athletic teams, and auto mechanics are to drivers. Is it any wonder that they never question the essence of what they are doing and concentrate on finding ways to do it better? We cannot eliminate disease from the world, so the nurse need never question her or his vocation. It is unlikely that even the spectacular inanity and corruption of college athletics will cause it to come to an end, so coaches will only question what they do in their most secret hearts.
Japan and Detroit will never produce a perfect automobile, so the auto mechanic will always be with us. However, it is technically and practically possible to devise an academic library in which BI, as we know it today, would be unnecessary. The author also believes that academic librarians of all kinds should work together to achieve such libraries and, in the process, transform completely both the nature of the work that we do individually and the passive and reactive ethos that pervades today's academic librarianship.

**Principles of the BI-less Library**

The BI-less academic library will take advantage of modern technology but will not be driven by technology. Such a library will be service oriented and will strive to provide the services that users want rather than the services that we believe they ought to want. It will hold fast to the enduring mission of librarianship—the connection of users with collections of carriers of knowledge and information and with services based on those carriers in the most cost-efficient and cost-beneficial manner possible. Librarianship, as such, is not, and should not be, altered by the indisputable fact that the carriers of knowledge and information found in, or available from, the modern academic library include computer files and video documents of various kinds as well as books, journals, maps, printed and recorded music, etc. In this area as in others, it is very important to see librarianship as having enduring principles and continuity with its own history. It is also important that librarians of all kinds see themselves as members of a unitary profession and that the divisiveness of the past (expressed most notably, though not exclusively, in the distinction between "public" and "technical" services) be done away with. If we are to achieve the BI-less library, we have to work together with a common sense of purpose.

**Obstacles**

There are, of course, barriers to this beau ideal of an academic library. This discussion has alluded to some of the self-inflicted barriers (historical amnesia, professional fragmentation, technomania and "info-babble," ignorance of enduring principles) but there are others, equally great and not able to be overcome from within the profession. Funding is one such barrier and the politics and strategy of new technology and interaction with the private sector is another.

Libraries are chronically underfunded because they are chronically undervalued. It seems that the best way of making ourselves and libraries more valued is to make the library experience *more pleasant* (by making the library accessible and easy to use) on
the one hand and more rewarding (by showing the value of collections and services) on the other. Striving for a library in which BI is unnecessary will assist materially in achieving these goals.

It is certain that the BI-less library is feasible technologically. There are, however, a number of issues concerning the interaction between the library and other campus units and between the library and the purveyors of primary (publishers in all media) and secondary (indexing and abstracting) services that are going to be complex and difficult to resolve. This author is convinced that they are not insuperable, and that a web of economic, technological, and practical accommodations can be achieved by the library and the various other parties.

**WHAT WILL THE BI-LESS LIBRARY LOOK LIKE?**

There is a fashionable view that, in reaction to the fact that the library of the past and present has been defined by a particular building or set of buildings housing particular collections, the library of the future will be an abstraction—an electronic web in which the physical location of the user is irrelevant. Modern writings are full of statements such as: “Ownership is unimportant, access is all-important.” I confess to having played a small part in propagating this view. It is undoubtedly true that the Fortress Library—that self-sufficient ideal that never really existed in fact—is inconceivable in the modern world. This has led some to the conclusion that the physical library no longer has any meaning. It is a good example of the Manichean nature of advanced library thinking today—the kind of simple minded approach that leads to the belief that, since we have electronic communication and electronic documents, printed documents no longer matter. The truth is, alas, more complicated than such dualists can bear. Books and computer files and all the other kinds of document that exist are important and will continue to be important. In the same way, academic libraries as physical entities and collections are as important to their users as is access to other collections and services by electronic means. In short, the BI-less library will have to deal with both. The library will still be based in a building or in buildings on campus, and the chances are that the use of those buildings will increase. This latter statement is, again, at odds with the ideas of many forward thinkers. They argue that access to library services electronically from offices, dorms, or wherever will diminish use of the physical library. In this, they ignore two other forces. The first is the human need for human contact, a force that drives more library use than is generally acknowledged. The second is that the removal of the barriers to library use that is within our power will awake the sleeping beast of
unsatisfied demand and lead to dramatic increases in that use. The fact is that many academic libraries have marginalized themselves by becoming places that only the dedicated and highly motivated care to use. Who knows what will happen when the library becomes attractive to persons of low motivation who are turned off by current and (usually unintentionally) user-hostile libraries?

**Making the Academic Library Easier to Use**

It is a melancholy fact that many academic libraries are uninviting in their aspect and seem almost at pains to hide the very fact that they are libraries in which materials and services are available. Any supermarket that had the layout and signage of the average academic library would be out of business within six months. Why is this? In part, it arises from the fact that many academic library buildings are ill-planned and/or outmoded. The physical plant with which we have to deal is often intrinsically off-putting to the user; inadequate in terms of available space in which to house materials and staff; poorly maintained; and fitted with furniture and equipment that neither harmonize with each other nor are 100 percent functional. This state of affairs often leads to a kind of defeatism. The BI-less library, no matter how severe its physical limitations, will have plentiful, attractive, and informative signs containing short words (in English not library-speak) and will have the best interior decoration and layout that can be contrived. Brief descriptions of the library and its services written in plain English (and in other languages when appropriate) will be available in abundance, as will specialized guides to particular areas and services. Audio tapes containing a "self-guided" tour of the library (in English and in other languages when appropriate) will be made available to all users. Pocket cassette players will also be available to the 0.01 percent of students that do not possess such machines. There will be booths, just inside or just outside the entrance to the library, containing an interactive video presentation about libraries, this particular library, and the range of services that are available. It will be possible for the user to branch off from the main presentation to explore some aspect of the library and its services that he or she finds particularly interesting. Once in the library, the route to each department and service will be clearly marked both by signs and light tracking and on electronic floor plans that will light up not only the desired department and/or service but also the fastest route to it.

Terminals to gain access to the library’s comprehensive online computer system (described later) will be numerous, well-sited, and physically easy to use. Implied in the latter is the provision of adequate
space for printed materials, writing notes, etc.; of glare-free easy to read screens and conveniently situated keyboards; and of terminals that can be used by the visually impaired, those in wheelchairs, and others to whom the standard terminal configurations present challenges.

The physical layout and interior of the BI-less library will be self-explanatory and the functions of the librarians and staff will be clear to even the inexperienced user. The task of working within such an environment will involve a complete orientation toward service and the eschewing of elitist and other nonservice oriented traits and attitudes. The BI-less library will need librarians who are inclusive rather than exclusive, flexible rather than rigid, and committed to the idea of the library as a resource for all rather than a shrine to ancient values.

**WHAT WILL ACADEMIC LIBRARY ONLINE SYSTEMS BE LIKE?**

It is evident to all that electronic bibliographic control systems are a mainstay of the modern library. Such arguments as there are concern the nature of the systems and their cost. We have progressed from automated and partially automated catalogs and circulation systems to the routine installation of comprehensive and integrated systems that also cover serial control, acquisitions, binding, reserved books, and other arcana. It is only a matter of time, it seems, before we move beyond the automation and integration of internal library systems to the integration of those systems with, eventually, all of the following: online systems of other libraries; CD-ROM indexes; indexing and abstracting databases on local mainframe and minicomputers and on remote computers; electronic assemblages of data; full-text electronic databases; and electronic image databases containing graphic and full-text data. Some of these other systems are, at present, in the public domain, others in the private sector. There are strategic and financial difficulties of some complexity to be overcome, but it is entirely probable that integrated access to all of these will be available widely during the 1990s.

In the BI-less library, user-friendly terminals will guide even the neophyte through the maze without pain or human mediation. Upon approaching the terminal, the user will see a brief explanation of the services available. The subsequent “dialogue” might run something like this.

**SCREEN:** Welcome to the Wormwood Library! I can give you information about all the books, films, music, software, journals, and many other materials that are available to you in this library and from other libraries. Just press the number indicated if you
want material on a subject (1), associated with a person (2), with a title (3), with a classification number (4), ... [goes on to enumerate all the many means of access]

User: 1

Screen: Do you want everything on a subject (Press 1) or just books (Press 2) or recent journal articles (Press 3) or something else (Press 4)?

User: 3

Screen: Please type the word(s) that best describe the subject.

User: Eggplants

Smart terminal: [Consults integrated CD-ROM index. Finds something and, therefore, does not consult remote or local online databases.]

Screen: Do you want EGGPLANTS (Press 1) or COOKERY (EGGPLANTS) (Press 2) or both (Press 3)?

User: 2

System: [Locates several articles. Takes the two most recent and matches them with the library's hard copy, microform, and videobank holdings]

Screen: Here are two recent articles:

—A fragrant stew of eggplant, potatoes and spices (includes recipe) by Marian Burros 10 col in. v139 The New York Times Feb 25 '90 sec 1 p47 col 1 *** AVAILABLE IN THIS LIBRARY ***

—Farm-fresh means fantastic! (recipes) by Betsy Freese il v87 Successful Farming May '89 p50 *** PRINTOUT AVAILABLE *** Would you like some more? (Press Y for Yes, N for No)

User: N

Screen: Would you like help with interpreting these entries? (Y = Yes N = No)

User: Y

Screen: The first is in column 1 of page 47 of section 1 of the February 25th 1990 issue of the New York Times. You may see the actual newspaper by asking at the Periodicals Desk (left of the Main Entrance on the first floor of this building). The second is on page 50 of the May 1989 issue of Successful Farming. It is illustrated. A printout of the article is available from the library's journal VideoBank. Do you want a printout? (Y = Yes, N = No)

User: Y

Screen: Printing

System: [Locates video image of article in computerized databank. Prints it out on high definition printer next to terminal.]

Screen: Thank you. Have a nice day!

The possibilities inherent in such advanced and multilevel interaction of systems are exciting and multifarious. Successful interactive interfaces for such complex systems will necessarily be the result of the work of teams of library automation experts, bibliographic experts, reference librarians, and library instruction librarians. It will be difficult to finance the construction and testing of early efforts in this direction. It is never easy to create new systems especially
when they are as new and complicated as those proposed here, but the rewards will be more than commensurate with the difficulty, and the resulting systems will constitute a major advance in library service.

MOOERS'S LAW AND DUCK SOUP

One of the principles that libraries and librarians ignore often and at their peril is encapsulated in Mooers's Law which may be paraphrased in this context as: No one will put more effort into the use of a system than the benefit she or he expects to derive from it. The whole basis of the BI-less library is in the idea that all library use should be made as easy as possible, which is, of course, to say that the library of the future must be far easier to use than is the library of the past and present. In order to achieve this we must be able to approach the wholesale re-evaluation of the library from the user's point of view. This author has been, for more than three decades, a committed Marxist (of the Groucho tendency). Thinking about the perfectibility of libraries and their systems and the process of making all of our collections and services available with little or no effort by the user brings to mind the most relevant Marxist analysis of such subjects. It occurs in Duck Soup when the immortal Groucho (as Rufus T. Firefly) is confronted with a complex report:

Minister of Finance: Your Excellency, here is the Treasury Department's report. I hope you'll find it clear.

Firefly: Clear? Huh! Why, a four year old child could understand this report. [Long pause as he studies it.] Run out and find me a four year old child. I can't make head or tail out of it.

The danger is, of course, that we will make systems that seem simple to us and will ignore the way the system appears to others. Send for a child of four!
About the Contributors

Betsey Baker is currently Head of Northwestern University's Reference Library. In 1986 she was elected chair of the Bibliographic Instruction Section of ALA's Association of College and Research Libraries, a group of over 4,000 members. She has published twenty-four papers in the area of library user education and remains active nationally in promoting user education activity in libraries of all types. She was co-recipient of the OCLC Library Literature award in 1983 for a paper on electronic databases.

Judith C. Espinola is currently Dean of the Creative Arts Division and member of the faculty at DeAnza College, Cupertino, California and was previously Coordinator of Media Services at The Evergreen State College, Olympia, Washington. She has taught in the areas of theatre, speech, oral interpretation, and media studies at the Evergreen State College, the University of Washington, Northwestern University, and the University of Delaware. She is a practicing performer and director and has written articles for Speech Monographs and the Western Speech Communication journal.

Marie Fielder has held faculty appointments at Stanford University, San Francisco State University, and Oregon State University. Currently, she enjoys an active consulting practice with school administrators, principally superintendents of high problem urban school systems. Her ongoing research focuses on the development of faculty leadership and the affirmation of diversity as these influence the creation of nurturing learning communities. Dr. Fielder is a founding board member of the Field Institute, a national Ph.D. granting institution for mid-career learners.
MICHAEL GORMAN is currently Dean of Library Services at the Henry Madden Library, California State University, Fresno. From 1977 to 1988 he worked at the University of Illinois at Urbana-Champaign Library. He has taught at library schools in his native Britain and in the United States. He is the first editor of the Anglo-American Cataloguing Rules, 2d ed. (1978) and the revision of that work (1988). He is the author of The Concise AACR2 (1988), editor and contributor of Technical Services Today and Tomorrow (1990), and editor of Convergence (proceedings of the 2nd National LITA Conference), published in 1991. He is also author of more than eighty articles in professional and scholarly journals. He has contributed chapters to a number of books and is the author or editor of other books and monographs. Dean Gorman is a fellow of the (British) Library Association and the 1979 recipient of the Margaret Mann Citation.

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Sarah Pedersen is Dean of Library Services and member of the faculty at the Evergreen State College in Olympia, Washington. Her recent activities include developing regional workshops on the integration of bibliographic instruction with college course content, teaching literature and library research methods as part of an interdisciplinary program on the city and articulating the role of librarians in innovation in higher education.

Donna Rubens is Coordinator of Bibliographic Instruction at the Institute of Technology Libraries, University of Minnesota, where
she teaches online searching and science bibliography. She also directs ESTIS, a leading fee-based service for business clients and is past chair of FISCAL, an ACRL discussion group for fee-based service managers. She is on the international editorial board of *Informedia*. The topics of her eight published articles range from the "thinking like a searcher" model presented at the recent ACRL Fifth National Conference, to business opportunities in oil spill cleanup.

**Stephen K. Stoan** is Assistant Director for Public Services at the University of Texas at Arlington Libraries. He holds a Ph.D. in History from Duke University and the M.L.S. from Kent State University. His publications in librarianship include "Computer Searching: A Primer for the Uninformed Scholar." *Academe*, 68(November/December 1982); "Research and Library Skills: An Analysis and Interpretation." *College and Research Libraries*, 45(March 1984); and "Social Science Literature." In *Sources of Information in the Social Sciences* (Chicago, IL: ALA, 1986).

**Dal S. Symes** is Associate Professor of Libraries (Humanities) at Western Washington University (WWU). He holds a Ph.D. in English from the University of New Mexico as well as an M.A. in Library and Information Management from the University of Denver. He has co-authored another article on the concept of bibliographic citation with Raymond McInnis and is actively involved in instituting library instruction classes at WWU.

**Patrick Wilson** is professor emeritus in the School of Library and Information Studies, University of California at Berkeley. He has written on a wide range of theoretical issues in library and information studies, including bibliographical control, the nature of relevance, cataloging theory, information use, reference service policy, social epistemology, and cognitive authority. A recent article on copyright and intellectual freedom appears in the Spring 1990 issue of *Library Trends*. 
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This double issue of Library Trends focuses on public protection and paternalistic censorship and the economic and practical aspects of intellectual freedom.

**Toward Information Literacy—Innovative Perspectives for the 1990s**
(Winter 1991) Edited by Mary Huston
The issue offers ambitious and innovative ideas which challenge the accepted thoughts regarding the appropriate scope and outcome of user education.

**Off-Campus Library Programs in Higher Education**
(Spring 1991) Edited by William Aguilar, Marie Kascus, and Lori Keenan
This issue is a state-of-the-art review of the delivery of library services to sites located at a distance from an academic institution's main campus.

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