The Reference Connection: Teaching Thinking Skills within the Library Reference Interview

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THE REFERENCE CONNECTION: TEACHING THINKING SKILLS WITHIN
THE LIBRARY REFERENCE INTERVIEW

A Thesis Presented

by

CYNTIA K. FUSCO

Submitted to the Office of Graduate Studies and Research of
the University of Massachusetts at Boston in partial
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THE REFERENCE CONNECTION: TEACHING THINKING SKILLS WITHIN THE LIBRARY REFERENCE INTERVIEW

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ABSTRACT

THE REFERENCE CONNECTION: TEACHING THINKING SKILLS WITHIN THE LIBRARY REFERENCE INTERVIEW

MAY 1991

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Library research is a thinking process composed of discrete, identifiable critical and creative thinking skills. These skills may be taught in school libraries as part of the reference interview, a conversation that occurs between librarians and student researchers. In order for this to take place, it is first necessary to understand the political importance of the definitional problems associated with the instructional role of the school librarian, to identify the steps in the research process and their related thinking skills, and to acknowledge the cognitive and affective aspects of the research process.

School librarians who wish to include teaching as part of their duties often face a problem of role definition. Simply stated, they must convince the teachers and administrators of their school systems that this is a valid role by lobbying for their cause and demonstrating the effectiveness of their teaching expertise. One solution to these political and pedagogical problems is the deliberate
construction of a library reference interview integrated with discrete critical and creative thinking skills. The success of this interview depends upon the librarian’s own clear understanding of the steps in the research process and the identification of appropriate thinking skills. It also relies heavily upon the librarian’s assessment of the student’s abilities, interests, and attitudes used to determine the course of the interview and to identify the thinking skills required by the research project that the student wishes to undertake.

This thesis concludes with the presentation of model dialogues. These examples are composites drawn from actual experience and are designed to illustrate the practical application of critical and creative thinking theory to library research.
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CHAPTER I
OVERVIEW
Introduction

The premise of this thesis is that library research is a thinking process composed of discrete, identifiable thinking skills. These skills may be taught during the research process as part of the reference interview, a conversation that naturally occurs between librarians and student researchers. These dialogues can be used by the school librarian as the vehicle to integrate lessons and practice in thinking skills within the context of everyday school library operations.

In these dialogues, the role of the school librarian is expanded to include that of a teacher of thinking skills. Librarians acting in this capacity encourage their students to generate questions to be answered, to design their own research paths, to evaluate their sources, and to modify their ideas as indicated by the discovery of new information.

These dialogues take place within a context rich with psychological overtones and affective influences which emanate from the school setting, the inherent nature of library research, as well as existing student and adult attitudes towards education, research, and each other. These factors must be taken into consideration as they exert either positive or negative influences upon teaching and the research process.
This thesis provides information drawn from the research of others and the author's personal experiences concerning school library research and its attendant influencing factors. It concludes with models of library dialogue that have been purposefully integrated with the teaching of thinking skills.

Organization of Thesis

Chapter Two, the Instructional Role of the School Library, provides background information concerning the changing educational role of school libraries and explores the nature of the relationship between the educational process, the thinking skills movement, and library skill instruction. It places the school library reference interview within its context.

Chapter Three, The Research Process, outlines the steps in library research. This outline is used to organize the order of presentation of the appropriate thinking skills which are identified in Chapter Four.

Chapter Four, Thinking Skills Used in Library Research, is based on the premise that research demands the use of both creative and critical thinking skills. The existence of these skills is one of the operating assumptions of this paper. Gubbins' Matrix of Thinking Skills (Appendix A) was used to identify the thinking skills to be taught during library research. Skills appropriate to library research
can be found under the broad headings of divergent thinking skills, decision making, evaluative thinking skills, and problem solving.

The divergent thinking skills related to library research are those of listing attributes of objects, fluency, flexibility, originality, and elaboration. The evaluative thinking skills particularly appropriate to library research are judging the credibility of a source and identifying central issues. The decision making skills involve the ability to state a desired goal, to state obstacles to this goal, to identify alternatives, to examine alternatives, to choose the best alternative and to evaluate actions.

Library research is identified as a problem solving activity using the problem solving skills of identifying the general problem, clarifying the problem, formulating hypotheses, formulating appropriate questions, generating related ideas, formulating alternative solutions, and choosing the best solution.

The effectiveness of teaching through dialogue is influenced by factors which include the developmental level of the student, emotions associated with library research, and the reactions of the librarian to her students. Chapter Five, The Developmental and Affective Factors of Library Research, presents current research concerning these influences and suggests ways to make practical use of this information during the library reference interview.
Chapter Six, *Dialogues to Teach Thinking*, begins with a consideration of the role of questioning and wait time in teaching and concludes with dialogue models. These models are meant to suggest ways that dialogue can be used to teach a variety of students thinking skill lessons that are appropriate to them as individuals.

Chapter Seven, *Reflections*, considers the effects of teaching through questioning on both teacher and student. It considers the effectiveness of teaching thinking skills through the reference interview and is concluded by suggestions of avenues of further research.

**Author’s Background**

I have been the School Librarian at a suburban high school for the past fifteen years. During that time, I have become increasingly intrigued with adolescents, their perceptions of the world, their views of themselves, their potential as learners. In the late 1980's The Critical and Creative Thinking Program at the University of Massachusetts/Boston introduced me to its educational ideas and I have since become a strong advocate of teaching students to become good thinkers.

When the time came to write a thesis, the natural question became: how can a school librarian teach thinking skills? The answer seemed to be: through dialogue.

The body of the thesis grew from the necessity to explain the choice of dialogue as the vehicle to teach thinking skills, to place these conversations in a context
and to explore what may be the hidden influencing factors. The model dialogues are drawn from thousands of conversations that I had with students throughout the years.
CHAPTER II
INSTRUCTIONAL ROLE OF THE SCHOOL LIBRARY

Introduction

The use of dialogue to teach thinking skills as part of the high school library reference process departs from common practice at two points: it is an expansion of the traditional role of the school library and it changes the format of the research reference interview.

These changes can be understood more clearly when the school library's role is placed in the context of the broader educational setting and the proposed technique of teaching through dialogue is contrasted with traditional methods of teaching research skills. This chapter presents the background information concerning the historical and changing role of the school library, identifies the traditional approaches to teaching research skills and identifies dialogue as a solution to the overall problem of teaching thinking skills in a fairly non-supportive setting.

Defining the School Library's Role

A school library functions as a support service. This means that services it provides are created, defined, and performed in response to the resource demands of the school's curriculum and by the individual informational requests of students and faculty.
Certainly, the primary function of a library is to be an information resource. This thesis offers no quarrel with this concept; however, if school libraries are viewed strictly as passive repositories of information, a problem is then created for school librarians who wish to expand the role of the library and their own job tasks to include teaching. They may find themselves having to lobby others for the right to perform this additional activity.

Dialogue was chosen as the vehicle to teach thinking skills because conducting a reference interview is a universally accepted librarian activity. As such, dialogue provides a means to begin teaching thinking skills within traditional perceptions of library activities while the political work of establishing the school library as part of the educational process is taking place.

As education moves beyond the textbook and the classroom, the school library media center and its programs are essential to the educational process, providing access to a collection of skillfully selected, organized, and managed resources ... a major channel through which the changing body of knowledge flows (Massachusetts Association for Educational Media, 1988, p.1).

This description of the library's place within the school implies a dynamic relationship between the school and its library. While it accurately describes the traditional library activity of providing access to information, it ignores the educational potential of the library by leaving out the role of the librarian as teacher and library education as part of the school's curriculum.
The fact that one of its own professional organizations, The Massachusetts Association for Educational Media, gives short shrift to the school library's educational role both illustrates and is symptomatic of a problem that frequently exists concerning the definition of the librarian's role in today's schools: recognition is given by the administration and fellow teachers to an essential, traditional part of the library's contribution — providing information — while its instructional aspect is ignored. It should be noted that the instructional role of the high school library or media center has changed since 1953/54 when "37% of U.S. secondary schools reported receiving the services of a centralized library" and "teaching . . . was still dominated by the textbook" (Craver, 1986, p.183). Its general evolution, at least as described in the literature, included growth of learner centered education, the function of the librarian in instructional design, and the inclusion of computers in the library. By the early eighties (1980 - 1984)

an analysis of the books and articles published during this short period depicts library media specialists who realized that they must retain an active instructional role with teachers and students while simultaneously adding yet another educational dimension to their role . . . . library media specialists were being urged to consider their educational role within the framework of the total program (Craver, 1986, p. 190).
It is important to note that while substantive changes may have appeared in the literature, they did not necessarily occur in the school building. A re-occurring theme found throughout this survey is a reflection on the "dichotomy between the actual role of the school library media specialists and the one proposed by the profession in publications" (Craver, 1986, p.189).

Craver concludes her survey by observing that

a clear pattern of progressive development of the instructional role has persisted in the standards and the literature. The changes in the library media specialist's role from study hall monitor to curriculum designer can certainly be termed substantive. An analysis of research studies, however, indicates a possible time lag between the practiced instructional role of the library media specialist and the one espoused in the literature (Craver, 1986, p.190).

Marland (1990) has identified

five conditions for any educational activity to flourish . . . a fair definition of aims . . . an expectation of its value . . . specific teaching - research has shown that . . . students may not learn everything, but they do learn more than if you did not teach it . . . a suitable range of materials . . . (and) opportunities to practice . . . (Marland, 1990, p.3).

It is the absence of several, if not all, of these supportive conditions that impede a school librarian's efforts to assume a teaching role. Of these factors, my experience has indicated that it is the lack of opportunity to practice that becomes the greatest obstacle to assuming a teaching role and to becoming a part of the curriculum planning process. This is a practical problem created by
the wide assortment of duties -- book acquisitioning, cataloguing, record keeping -- that legitimately require professional time. It is frequently exacerbated by a shortage of clerical assistance, a result of chronic underfunding.

The problem is complicated by a perennial problem of librarians -- stereotyping. It has been my experience that other professional educators do not consider a school librarian to be an teacher. We are perceived as sources of information and as book dispensers. Although these are important activities, this rather limited conception of the librarian's place in education makes it necessary for librarians to actively work to change the perceptions of their co-workers. It is only when these conceptions are expanded that librarians can become participants in the planning and execution of the school curriculum.

To understand the differences associated with the use of dialogue in the interview, it is necessary to first consider the more traditional approach to teaching research skills. This contrast in teaching technique underscores the power of using dialogue in the library setting.

The Traditional Approach

When librarians have been called upon to take the role of teacher and provide instruction in library skills, it is not generally expected that they provide thinking skill instruction as well. The traditional expectation of librarian as teacher is that the lesson will present the
factual knowledge concerning the library, its rules and organization. This basically means that students are expected to become familiar with the physical lay-out of the library, its classification system, and to learn how to use several different indexes, notably the card catalogue and the Reader's Guide to Periodical Literature. With a few outstanding exceptions, thinking skills are rarely mentioned as one of the teaching objectives for the library skills unit.

This traditional approach is reflected in the phrasing of teacher requests for library orientation programs. "Could you just show them around the library and explain something about the card catalog?" sums up many teachers' perceptions of the instructional role of librarians.

Magazine articles which give advice to students on how to do term papers and in textbooks which are used to teach writing also reflect the traditional approach. The focus of the material is on the information finding process; the use of thinking skills is neglected.

"The NO Panic Term Paper" (1989) serves as an example of an article written to "help make research paper writing easier and increase your chances for a good grade." It has bright cartoons as well as a clearly written text. The advice is sound, including "write something you like," "develop an area of expertise," "narrow your topic," "don't procrastinate," etc. Under the idea of developing an area of expertise, students are told to "read everything you can get about that subject . . . it keeps you up to date . . ."
and teachers love lots of sources." This would have been
the ideal place for the author to include a note on critical
thinking about the sources, but it did not happen.

*Warriner's English Grammar and Composition* (1986), a
standard textbook on composition, does much the same thing.
Emphasis is placed upon the library's resources. Critical
thinking receives a brief mention in two places where it is
described as analysis.

Traditional approaches leave out the last half of the
equation. While it is important to identify available
resources and to find them, it is equally important to
effectively think about this information.

Librarians discover their patrons informational needs
through a reference interview. The traditional view of this
service is found in Warriner (1986). The following advice
is given the student under the heading "Help from the
Librarian."

> When you need to find information, do not be
afraid to ask the librarian for help. The
librarian can help you locate the circulation
desk, the card catalog, the reference section, and
other special sections of the library (Warriner,

This description of the librarian's role as a source
of information concerning the lay-out of the library and the
location of its books reflects the traditional approach to
library research service. In this approach, students are
simply told where to find the information or given a stack
of books and periodicals that the librarian has found for
them. The hallmark of the traditional approach to library skills education and to the relationship between student and librarian is its emphasis on fact-finding.

For instance, imagine that Robert, a Junior, has been assigned by his teacher to write a ten page paper on "any subject from 1898 until the present." He has, for reasons known only to himself, decided that World War II is the perfect subject.

He approaches the desk and stands there very quietly with an expectant look on his face. He is neat and well-kept, wearing a short sleeved, striped shirt and Levi jeans.

The librarian says: "Can I help you?"

He says: "I need books on World War II."

She says: "Look in the 940.54 section. It is against
the wall under the clock." (There are alternatives to this answer. The student may be told to "look it up" or the librarian may simply walk over to the section on World War II and start handing the student books. Either way, the student will probably get his information.)

Factual information about a library and its resources is, of course, necessary. Students must know how to use an index and be able to find the Biography section. The problem with this approach is that it doesn't go far enough. It helps students to find information but does nothing to teach them to organize their research efficiently, understand the effects of the information they find upon their thesis, or to consider the reliability of their
information sources. It does not teach them to think about either the process of finding information or the information once it is found.

Combining Thinking Skills with Library Instruction

Librarians who promote the teaching of thinking skills will find that the teaching of these skills as part of the library instruction receives mixed recognition. Within some segments of the library science field, discussions of thinking and library instruction are fairly common. For instance, teaching students to think was the theme of the Fall 1986 issue of School Library Media Quarterly. This issue offers a striking contrast to other writings in the library science field and general education. In these documents, the relationship of the school library to the educational process and/or the inclusion of thinking skills within the library curriculum receives little, if any, conscious attention. Two good examples of the latter are the standards for school media centers in Massachusetts produced by the Massachusetts Association for Educational Media (MAEM) and the recommendations found in a Nation at Risk.

A close reading of MAEM's Standards for School Library Media Centers in the Commonwealth of Massachusetts indicates that of the thirty-one page booklet that describes, among other things, the direct and indirect roles of the professional and support staff as well as a scope and sequence outline for grades K-12, references to thinking
skills appeared in exactly four places and then primarily by implication. Students in 4-6 would learn "techniques of critical viewing and listening skills for evaluating audiovisual media." Students in 7-8 would exhibit "independent research skills" and make "informed judgment of credibility and reliability of print and non-print sources." Those in 9-12 would "have a strong foundation in assessing print and non-print materials and will use critical sources for evaluation purposes" (Massachusetts Association for Educational Media, 1988, pp.25 & 26). Finally, providing "materials on opposing sides of controversial issues so that students may develop, under guidance, the practice of critical thinking and critical analysis of all media" is listed as one of the objectives for selecting media. Missing from these standards is a sense of commitment to the teaching of thinking.

As a final example of the disparity between the views of librarians and the broader educational establishment, consider A Nation at Risk, which report "recognizes that effective participation in our 'learning society' requires each person to be able to manage complex information in electronic and digital form," and yet "makes no recommendations on the role of library and information resources in elementary and secondary schools" (Hasim, 1986, p.17).

It should be noted that thinking instruction in libraries is an orphan within the thinking skills movement itself. As one article for School Library Media Quarterly, 15
the official publication of the American Association of School Librarians, reports, there are few references in the literature on teaching thinking skills in school library media programs. In addition, broad based educational groups -- the "Collaborative on Thinking" is one -- that organize to study ways to improve student thinking fail to include members of the library media field. The article summarizes the situation by identifying:

the existence of serious problems related to general awareness of the degree and type of potential involvement of library media professionals in the development of student thinking skills (Mancall, et al, 1986, p.19).

Although this general unawareness exists, work in this particular area of education does take place in some quarters. Kuhlthau (1985b) and Stripling and Pitts (1989) have analyzed and described library research as a connected series of thinking processes and have used their work to create lesson plans for the research process. Kuhlthau (1985a, 1985b, 1988, 1989a, 1989b, has studied the affective aspects of the process as experienced by student researchers. The need for additional research in this area has been identified (Craver, 1989). In addition, articles on the subject sometimes do appear in professional periodicals and are indexed in Library Literature. Librarians who want to teach thinking skills have this body of work as a resource.
However, within their school building, these efforts might also be hampered by immediate circumstances. The perceived role of the library within that particular school may not be an instructional one or the school may not include thinking skills as part of its curriculum. One way to immediately begin addressing the need to teach thinking skills is through dialogue.

**Dialogue a Solution**

Despite the negative influence of the lack of general support from the educational community, it is still possible to teach thinking skills as part of library instruction through dialogue. Dialogue is a familiar educational technique dating back to Socrates; today it is discussed in the literature in terms of effective teacher questioning and wait time. It can be used to further the teaching of thinking skills within existing educational settings and without specific, broad-based support. Nothing has to be changed to allow it to occur. In the library setting, dialogue takes place on a daily basis as part of the expected and established research routine.

**Conclusion**

The use of the reference interview as a vehicle to teach thinking skills combines two gradually emerging threads of modern education -- the school librarian as educator and the teaching of thinking skills. The dialogue models presented in this paper are intended to illustrate a
method of expanding the educational role of the library beyond the teaching of factual library research skills.

The first step involves acquiring one's own understanding of the dynamics of the situation as well as what is to be taught. In other words, effectiveness as a teacher of thinking skills within a school library setting requires a clear conception of the steps of the research process, an identification of the relevant critical and creative thinking skills used at each step, an understanding of the cognitive and affective influences on the process combined with an ability to empathize with the student and an expertise in conducting a reference interview.
CHAPTER III

THE LIBRARY RESEARCH PROCESS

Introduction

The steps in the library research process provide an organizational framework for teaching. Students must learn to use the process to find resources and to thoughtfully use the information to create their final projects. A chart indicating the relationship between each step and its related thinking skill is found in Appendix B.

Teaching the Process

Library skills instruction can involve the presentation of facts about the library -- e.g. the use of the card catalog -- or it can go beyond the facts to library research as a thinking process. Today, one of the most encouraging trends in school library media work is the shift from a narrow, library skills focus (e.g., location and access) to a concern with broader information skills (e.g., information use, analysis, and evaluation. This shift makes sense intuitively . . . (Eisenberg, 1989, p. 224).

Librarians subscribing to the research as thinking process theory fall under what has been described as the "outside" approach to library instruction. This approach draws from the fields of education and psychology and applies learning theory to previously existing programs of bibliographic instruction or develops
instruction programs based upon learning theory. . . emphasis is placed upon analyzing information needs, evaluating resources . . . Process is supreme (Oberman, 1984, p.10).

The steps and procedures of library research are not particularly difficult to master, and once learned, become a natural part of a student's repertoire. It is important to note that

for the secondary school student, learning the process of seeking information is as important as expanding understanding of subject matter. The library research process consists of forming ideas through information as it is found (Kuhlthau, 1985, p.3).

Teachers choosing the thinking process approach to library education are, in effect, asking their students to think. This is done by insisting that students focus their research, organize their search path, evaluate materials found, and choose materials that follow the assignment guidelines and support their chosen thesis. Students who can perform these tasks are thinking more abstractly, beyond the level of simple recall.

It should be noted that a "main point of research - thinking about the topic and the information" (Stripling and Pitts, 1988, p.108) usually takes place outside of the library. This step in the process should be drawn to the student's attention during the reference interview.
Basic Steps in Library Research

In its narrow sense, the library research process could be broken down into a series of locational skills involving the ability to find resources in the library. These skills include:

- the understanding the books are shelved in order;
- the ability to distinguish fiction from nonfiction;
- the ability to follow alphabetical and numerical orders;
- the knowledge that information on spine labels is related to information on catalog cards;
- and the ability to use the card catalog as an index to the book collection (Eaton, 1989, p.358).

The library research process outlined at the locational skills level is the following:

1. choose topic
2. locate indexes
3. identify sources of information
4. find these sources

This plan of attack is useful. It gives students an organized approach to the library's resources and recognizes the importance of basic knowledge of library organization. However, it is limited because it does not include thinking about the information discovered nor does it consider the effect that newly acquired information can have upon one's research project. In addition, it leaves no space for changes in emotion that accompany research (Kuhlthau, 1985a, 1985b, 1988, 1989a, 1989b) nor does it consider the theoretical cognitive abilities of the student.
Expanding the Concept of Library Research

Library instruction becomes teaching a library research thinking process when students learn to select a realistic topic, to plan ways to find information, to evaluate their resources and to use new found information to shape their thesis. The research and analysis of Kuhlthau (1985a, 1985b, 1988, 1989a, 1989b) and Stripling and Pitts (1988) describe the research process in terms of the thinking skills necessary at each step in the process. These concepts have been used by Stripling and Pitts (1988) to design library lesson plans that reflect this cognitive description of library research. The steps in these plans emphasize the thinking activity that is particularly relevant at each point in the process.

Steps of "thoughtful research" (Stripling and Pitts, 1988, p.3) reflect a richer process that can be considered in terms of task, thoughts, feelings, actions, and strategies. This fleshed-out process forms the basis for librarian/student dialogues which are based upon the students needs, abilities, and research projects. These dialogues can be conducted to encourage students to think about the process of finding information and to use that information to form their thesis or statement of purpose, identify its supporting ideas, and to design their final product.
Outlines of Thoughtful Library Research

Kuhlthau (1985) has identified seven stages of the library research process. They are:

1. initiating a research assignment
2. selecting a topic
3. exploring information
4. forming a focus
5. collecting information
6. preparing to present
7. assessing the process

The wording of these steps reflects the changes that take place when research is taught as a series of thought processes rather than a simple listing of steps to find information.

Stripling and Pitts (1988) have developed a more detailed, ten-step outline. (See Appendix C.) Both sets of outlines and lesson plans are extremely helpful in identifying and clarifying the nature of thought in the research process. They were, however, primarily designed for classroom use which provides more of the time that is necessary for the development of thoughtful research.

The amount of time librarians have to spend with their students causes these steps to become somewhat modified when they are placed in the context of one student doing the major part of their research during one or two class periods. Experience strongly suggests that from the student's point of view, these steps are:
1. receive assignment.
2. choose a subject area.
3. find information

The outline of the steps that occur when this basic conception is developed as a thinking process is as follows:

1. receive assignment and follow guidelines
2. choose a broad topic
   a. brainstorm possibilities or
   b. use library materials as idea source
3. narrow the topic
   a. list attributes of subject or
   b. use library materials to identify topics
   c. identify possible thesis
4. find information
5. evaluate information

These activities are part of the larger task of writing a paper or preparing a presentation. While steps in the research process legitimately include writing the resulting paper or creating the final presentation, this work usually occurs outside of the library. For this reason, the above outline includes only those steps in the process that occur in the library itself, as this is the point at which interactions between students and librarians take place.
Conclusion

Students come to the library prepared to "collect information." Librarians call this a literature search. One student called it "ransacking the library." (Kuhlthau, 1985, p.59). Although there may be disagreement as to what collecting information means, there is common ground in that both students and librarian believe that a research activity of some kind is about to take place. It is up to the librarian to take charge of the conversation, to educate the students as to the nature and procedures of that process, and to assist them to become better thinkers during the process.
CHAPTER IV
THINKING SKILLS USED IN LIBRARY RESEARCH

Introduction

It is the library research process and the constraints imposed by the library setting that ultimately determine which of the critical and creative thinking skills will be taught. The skills identified as suitable for teaching through library dialogue have been drawn from Gubbins' Matrix (see Appendix A) which synthesizes the work of experts in the thinking skills field. They are the skills used in divergent thinking, decision making, evaluation, and problem solving. A more complete break-down and analysis of their use will be provided under the heading Library Research Thinking Skills found on page 28 in this chapter.

There are two areas in which students may be taught thinking skills in the library: formal lessons and dialogue. The formal lessons are the lesson plans, handouts, and activities usually associated with library orientations and classroom assignments. Although practice in thinking skills can be included as part of these activities, it is not always certain that formal, planned library instruction will occur. While dialogue offers the most sure opportunity to teach thinking skills, it also imposes certain restrictions on number and type of thinking skills that can be taught.
Choosing Thinking Skills

Teaching thinking through dialogue carries with it certain constraints. The thinking skills chosen to be taught in a high school library through dialogue are determined by the amount of time available to the librarian to work with the student, the goals of the student, and the appropriateness of the thinking skill to the task at hand.

The time constraint. Time is a major limiting factor. High school students involved in library research want to get in -- and out -- of the library as quickly as possible. It is necessary to be realistic in teaching thinking and to bear in mind that students are usually in a hurry and looking for instant results. The librarian's conversations with them must take this into account, otherwise the students become irritated, leave, and will have accomplished nothing.

As a constraint, time places a limit on the number of skills that can be taught. In practical terms, it means that students can be taught to infer something about the reliability of an author by the information on the book jacket and the publisher of the book. It is unlikely that the student will take the time to assess the author's assumptions while in the library as the information would have to be read prior to making this kind of evaluation.

The constraint of relevancy. The thinking skills taught in the library must be directly related to the library research as it is being done by the student. This involves taking a
hands-on approach, demonstrating each skill as it is needed in the research process. As background to this kind of teaching, the library research process must be understood as a series of steps and decisions requiring a clearly defined thinking skill or set of skills at each distinctive point.

Library Research Thinking Skills

The conception of thinking used as the basis for this paper divides thinking into two categories: creative and critical. Broadly stated, creative thinking allows us to generate ideas; critical thinking to evaluate them and choose the most reasonable course of action.

Library research makes use of critical and creative thinking at different point in its process. Research calls upon people to think creatively as they define their subject area, identify possible sources of information, and find the appropriate subject headings in the card catalog. Critical thinking comes into play as they include or discard possibilities, develop an appropriate list of resources, assess the relative value of available material and make the basic decision of whether this topic should be pursued at this time in this library.

The critical and creative thinking aspects of library research have been described as either "blueprints" or "brainstorms" (Stripling and Pitts, 1988). In their view, research helps students learn the lifelong "blueprint" skills of information use -- how to seek, find, and use ideas independently. Research also helps students acquire the "brainstorm"
skills" -- how to develop new, researched-based concepts and how to present findings in creative effective formats (Stripling & Pitts, 1988, p.2).

Critical and creative thinking skills are composed of smaller thinking skills. Library research dialogue can assist students in using one or more of this skill sub-sets. To identify the specific thinking skills educators are advised to . . .

select abilities that represent what they want students to be able to do and incorporate those particular skills into their curriculums and school programs. Researchers' lists can be the basis of such selection (Presneissen, 1985, p. 44).

Gubbins' Matrix of Thinking Skills (see Appendix A) has been used as an authority to identify the thinking skills in the process of library research presented in this paper. These skills fall under the headings of divergent thinking, decision making, evaluative skills, and problem solving.

Creative Thinking in Library Research

Creative thinking skills (Torrance, 1979) are used primarily at the beginning of the research project and at the time the final project is created. Gubbins' Matrix places these skills under the heading of Divergent Thinking Skills. They are identified as the ability to: list attribute of object/situation; generate multiple ideas (fluency); generate different ideas (flexibility); generate unique ideas (originality); generate detailed ideas
(elaboration) and to synthesize information. While each of these skills makes its particular contribution to the research process, they overlap as well.

Listing. The ability to list the attributes of an object/situation is used in the beginning stages of research to generate a list of possible topics, to create a list of smaller topics within a broader subject area, to identify possible subject headings and to find alternative subject headings as necessary. As an example, consider this list of possible topics generated by two high school junior girls. They were searching for a topic having to do with a contemporary problem. This was their beginning list: abortion, homosexuals, AIDS, teen suicide, child/marital abuse (mental abuse), death penalty, sexual abuse, rape, incest, controversy on whether we should have dropped A-bomb, peer pressure, anorexia, and baby-selling.

The skill of attribute listing is also used to break the chosen topic down into a series of parts. Some aspects of the concept "death penalty" might include criminals, rehabilitation, crimes punishable by death, laws, laws in various states and countries, stories of crime and punishment, and the history of capital punishment. In turn, attributes can be listed for each of these smaller topics. The results of this process include a range of subjects to be used in the paper and a list of possible card catalogue subject headings to be used in the search.
Fluency. Choosing a topic and listing attributes are enhanced by fluency. Having a multiplicity of ideas concerning a topic and its attributes provides a rich source of possibilities for topics and for useful subject headings. Students who lack fluency can become discouraged. They often decide that there is no information in the library about their topic because it isn't listed in the card catalog under the term that they are using. For instance, a student may want to research "panthers" in a card catalog that has placed all of its "panther" information under "cats." A non-fluent thinker will become stymied because there is no "panther" heading in the catalog and either give up entirely or ask the librarian for help. Fluent thinkers will try alternative subject headings -- e.g. animals, cats, nature, wild animals -- trying to discover the subject heading that will lead them to their information.

Flexible thinking. Flexible thinking makes it possible for students to change the direction of their research and sometimes the thesis or statement of purpose of their paper as different facts present themselves. For example, a student may want to write a paper defending the rights of smokers. When preliminary research in the school's library reveals few sources in favor of smoking and many sources against it, the student must make a decision. The topic could be abandoned, the thesis could be changed to take advantage of the easily accessible sources of information, or the student could decide to use other libraries.
Flexible thinking students have the ability to generate optional solutions to problems and to accept alternative solutions. Students lacking in this ability become fixated. They frequently insist on pursuing a topic long after it has been determined that resources are unavailable.

Originality. Original thinkers who are also fluent and flexible are effective library researchers. Their topics are different from those of their classmates and they maneuver through the library indexing systems with relative ease. A good example of originality was found in the freshman who researched punk rock and the meanings of the performer's clothing. Most of her classmates had chosen drugs, alcohol, murder, or abortion.

Original thinking can lead to problems when other divergent thinking skills are weak. An example of this latter conjunction of thinking skills is the student who is interested in balloons. This is a rather unusual reference request from a high school student and, in that sense, the thinking is original. This same student cannot accept the school's lack of information on the subject, will not change to another topic that can be researched in the school's collection, has no transportation to other libraries, and has missed assignment deadlines.

In order to be successful in his research, he needs to revise his thinking and to choose a topic researchable in
this library. His lack of the flexible thinking ability makes it almost impossible for him to change tack and he will probably never complete the assignment.

Elaboration. Students who possess this ability can identify many aspects of their subject which are used to support a paper's contentions and generate numerous possibilities for subject headings. The subject of "dogs" is a popular one with freshmen. This can be a dry, fact-filled report with no particular meaning unless it includes personal experiences, a plea for humane treatment, or a description of dogs at work. Elaborating the idea of "dog" suggests these possibilities.

Creative thinking is required at the conclusion of the research process as students prepare to present their work. .. Fluency, flexibility, originality, elaboration, and risk taking, all .. (are) woven through the process of creating a final product .. writing a formal paper, creating a videotape, or composing a letter to a historical person (Stripling and Pitts, 1988, p.136).

Although creative thinking is part of the conclusion of the research process, this activity usually takes place outside of the library. While it is possible to encourage creativity during the reference interview, there is little that can be done to help the process along after the student has left the room.

Student motivation. As Amabile's studies have demonstrated, there is a positive relationship between intrinsic motivation and creativity. Her basic thesis that "the
intrinsically motivated state is conducive to creativity, whereas the extrinsically motivated state is detrimental" (Amabile, 1983, p.9) is particularly meaningful to school librarians as most of their students are extrinsically motivated at the outset. Students must be encouraged to find their own topics of interest within the assignment guidelines as an intrinsic interest in the subject will promote the divergent thinking skills needed in their research.

**Critical Thinking Skills**

Critical thinking skills are used to narrow a topic, to identify useful sources of information and to evaluate these sources. They are also used to fulfill the assignment's guidelines, in time management, and to assess the ease of access to information.

**Decision making.** Decision making skills are used in determining the overall method of completing the homework assignment and in choosing a topic. "Decision making is the result of making a prediction based on constructs and selecting the most appealing or appropriate outcome" (Kuhlthau, 1988, p.32). When these predictions are accurate, they reinforce the existing construct; inaccurate predictions cause a corresponding change in constructs to match the actual occurrence. When this happens, learning has taken place (Kelly, 1955).
At the outset, students have to decide whether or not to do the work and how to schedule their time to make this possible. They then must choose a topic and begin working their way through the alternative sources of information.

Gubbins' Matrix of Thinking Skills (see Appendix A) has been used to name the discrete thinking skills that comprise decision making.

**Stating desired goal/condition.** The basic goals of library research are to successfully complete the assignment and to find the information necessary to accomplish this task. Teachers usually have indicated the length of the assignment, its subject area, and the numbers and kinds of resources to be used. Successful students learn to work to satisfy these requirements.

This larger goal becomes a series of smaller sub-goals: choose a broad topic, narrow the search, establish a statement of purpose or thesis, find the appropriate library indexes, locate the resources and evaluate them.

In selecting topics, students weigh the possible topics from what they already know about the topic and their constructs about the topic and others related to library research...they predict the probable outcome of their research and select the topics that have the most promising outcome (Kuhlthau, 1985, p.33).

Four criteria to use in choosing a topic have been identified. They are the student's interest in the topic, the degree to which it meets the requirements of the assignment, the amount of time available to collect and
organize the information, and the amount of material available (Kulhthau, 1985). These criteria can be communicated to the student during the reference interview. An additional decision to be made at this time may be that of presentation format as this influences the resources that need to be found (Stripling and Pitts, 1988). For example, a student who is drawing a picture or preparing a poster will spend more time looking for illustrations, graphs, and photographs than one who is writing a paper.

**Stating obstacles to goal/condition.** Students must acknowledge the obstacles that arise during the research process. These include a lack of factual knowledge concerning library organization, no time to do homework, the discovery that all of the books on the topic are gone from the library, a dislike for research, and a poor relationship with the teacher or librarian. Students must be able to identify these roadblocks and work out a strategy to overcome them, if possible.

Some of the solutions to these problems are relatively easy. Factual information is not hard to attain. Students can simply ask the librarian, a teacher, or another student. The issue of time management rests with the student's own organizational abilities, while a poor student-teacher relationship can cause a student to permanently stop working in that class.
Identifying alternatives. This skill of identifying alternatives is used in the choosing of topics, identifying possible subject headings, finding different kinds of information sources, even choosing another library to use. This skill is enhanced by creative thinking skills.

Examining alternatives. Students have to mull over the alternatives and decide which ones offer the most attractive benefits. In choosing a topic from a broad range of subjects, students must consider these possibilities against the pertinent criteria (Kuhlthau, 1985).

Choosing the best alternative. "Students select the best possible topics on the basis of their predictions of the outcome of their search" (Kuhlthau, 1985, p.33). Accurate predictions usually lead to satisfactory results. Part of the librarian's job is to guide students in making predictions which are made concerning the usefulness as well as the availability of library resources.

For instance, if information is lacking on a subject, a student may decide to use the inter-library loan department of the public library. The student may believe that the resources will arrive on time for the assignment to be completed. As librarians know, this is a risky assumption. The student should be encouraged to use the public library while continuing to search through the resources that are readily available.
Evaluative thinking skills. Evaluative skills are used in research to identify central issues and problems, judge the reliability of a source, and to detect bias. Additional skills -- e.g. recognizing loaded language -- are also used as part of the overall research and writing process, but in high school reading the resources, writing the paper, or creating the final product usually takes place outside of the library proper.

Identifying central issues. Students identify central issues and problems in the beginning stages of thinking about their topic. As this thinking draws from their present knowledge, the identification of these issues and problems may change as new information emerges. This is a thoughtful response to research that should be encouraged. "Students need to adapt and refine their focus through the information they collect" (Kuhlthau, 1985, p.87). Students can be asked to verbalize their conceptions of the issues in the early stages of the library reference interview. This helps them to clarify their thinking and suggests avenues of research.

The identification of problems also applies to the management of the research process as well as the topic. Students must realistically determine the amount of time to be spent on their project. They must decide if they are going to use other libraries or depend upon the information readily at hand. This latter decision often determines their topic.
Judging source credibility. The skill of judging the credibility of a source is particularly appropriate to library research as good information comes from sound sources. Students can make a reasonable assessment of the reliability of their sources from the material itself. Information concerning the author's background can be found either on the book jacket or provided in the back of the book. If the book itself is older, its information may be out of date. This is particularly true in science, health, and nutrition resources. Sometimes the publishing company itself indicates a possible bias in point of view — a book on Darwin from the Creationist Press, for instance.

Problem Solving in the Library

The library research process can be considered as a series of problems to be solved. The problem solving procedures and vocabulary as identified in Bransford (1984), Howard (1983), Polya (1957), and Wickelgren (1974) can be applied to library research as a means of developing a deeper understanding of the process.

Wickelgren (1974), first distinguishes one type of problem as being formal as opposed to personal. This formal category is divided into two other divisions: practical and puzzle. Practical problems are described in this way.

... formal problems include a large class of practical problems that people might encounter in the real world ... such as how to build a bridge across a river ... one is limited to some
specified set of materials (givens), operations, and of course, the goal of getting the bridge built (Wickelgren, 1974, p.2).

Research falls into the category of practical problems. It is less clearly defined than a formal mathematical problem, but still retains enough clearly identified aspects to qualify as a practical problem.

In Wickelgren's terms, the problem is to locate information. The givens include the available library materials, the scope of the assignment and the research question as defined by the student. The method of operation is the research process itself.

Other descriptions of problem solving can be used to describe the research process. Howard, for instance, has identified three characteristics of problems.

First, there is some initial state in which the person begins. Second, there is some goal state that is different from the initial state and which the person wishes to achieve. Third, the actions are necessary to convert the initial state into the goal state are not immediately obvious (Howard, 1983, p.407).

The initial state may vary from the need to locate any five sources on a topic to meet the requirements of an assignment, a desire to find statistics, or an emotional state of confusion. The goal may or may not be consciously defined by the student. It should be understood that the student who defines his problem as finding five sources will be solving a very different problem from the student who is confused by the Dewey Decimal System or the one who is
writing a composition on the literature of war. The first student will be generating possible subject headings while the second may be wondering how to find the librarian for help and an explanation of the system. The third will be looking for ideas that explain or explore the artistic literary expressions of a tragic fact of human existence.

Devising a way to meet the goal means planning and making use of one's knowledge of library organization plus effective time management.

Research problem solutions are as varied as the individual research problems. The answers are less exact than that of formal or well-defined problems, but significantly more precise than the solution of personal problems (Wickelgren, 1974) or ill-defined ones (Howard, 1983).

In the last analysis, the characterization of the library research problem as well-defined or as formal, ill-defined or personal, may not be particularly significant if Howard is correct in her reporting that when psychologists have studied problem solving, they have almost always used well-defined problems . . . for well-defined problems, it is possible to figure out an optimal strategy and to determine whether an individuals discover it . . . it is easy to determine whether or not the person has solved the problem. Psychologists usually assume that the major characteristics of problem solving will be the same for both well- and ill defined problems, since the same limitations and strengths of the human information processing system must come to bear on both. (Simon, 1973). . . this assumption remains to be tested empirically (Howard, p.410. Emphasis mine).
Problem solving and dialogue. Dialogue provides the vehicle to help students learn these "optimal" strategies. The language of problem solving provides a means of communicating the process to the student and offers ways to evaluate the results of the process. Is there a goal? What is it? Did you achieve it? How? If not, why?

The understanding that problem solving is a series of steps applies directly to the research process which is in itself a series of steps. This conception gives teachers something very specific to say to their students concerning the process. Nothing is more defeating to a student who does not possess research skills than to be told to "find information." They can do this only when they are able to break this large task into its smaller components.

Problem solving skills in research. As identified in Gubbins' Matrix (see Appendix A), these skills are so closely related to the decision making skills that in actual practice it may be difficult to separate one from the other. For example, "identifying the general problem", the first skill in the Problem Solving set of skills cannot help but be connected to the ability to state the desired goal/condition found in the Decision Making set. Clearly, for instance, in order to state a desired goal, it is necessary to understand the nature of the problem.

Stating desired goal/condition. Students who can clearly state the goals of their library research create a focus for their work. This marks a turning point in their
research (Kuhlthau, 1988), as the information they collect should naturally center on this topic.

**Formulating appropriate questions.** This skill is especially appropriate to library research as carefully considered, student-generated questions can be used to help students identify the sub-topics of the larger subject area that is the focus of their research. Asking students to pose their own questions can have the effect of stimulating interest while giving them confidence as questions are relatively easy to generate and no one has to know the answer.

**Choosing the best alternative.** The skill of choosing the best solution is used to select both topic and resources. Choosing the best alternative means predicting which topic of interest to the student is the most likely to allow a successful completion of the assignment.

**Conclusion**

Critical and creative skills are used throughout the library research process. "The purpose of library research is for students to find, select, evaluate, and use information to enhance their understanding of a subject" (Stripling and Pitts, 1988, p.161). Students can accomplish this purpose by using the thinking skills appropriate to each step in the process.

Library research takes place within a context of
cognitive development and emotion. Librarians who teach need to be aware of these additional influences as they effect the library research process itself.
Chapter V
Developmental and Affective Aspects of Library Research

Introduction

The success or failure of library research is influenced by cognitive and emotional factors that go beyond the simple need for information. These include the developmental level of the student, the librarian's assessment of the student, the degree of student motivation, and the ability of the librarian to create a library atmosphere conducive to thought. The degree of success in turning the reference interview into a thinking skills lesson relies heavily on the librarian's actions that take these factors into account.

Cognitive Development

The developmental concept of human growth and life is central to education. Teachers have the responsibility to assess students' cognitive ability and to design environments consistent with the principles of cognitive development. They must assess the cognitive demands of the task and the cognitive abilities of the students, and then systematically and often spontaneously match the two (Fusco, 1985, p.81).

Basic to the reference interview is the librarian's understanding of developmental psychology coupled with an ability to assess a student's stage of development or way of thinking about knowledge acquisition at the time of the interview. This assessment is based upon conversation, the
students age, grade, and course level. It is influenced by physical clues such as general appearance, neatness, dress, and body language.

Piaget's theories as interpreted and applied by Elkind provide useful operating assumptions for making these judgments concerning the intellectual abilities of our students. This skill is acquired through familiarity with Piaget's stages of development and then by observing the actions of many children to see how cognitive structures are revealed. Elkind describes the value of these insights in this way:

...they provide standards or guides according to which one can gauge the intellectual level of a wide variety of curriculum materials and their appropriateness for children at a given age. And second, they allow one to determine where particular children are, cognitively, with respect to their peers. Ability to diagnose cognitive structures is, then, beneficial to the selection of curriculum materials and to the individualization of instruction (Elkind, 1981, p.9).

In the library, this diagnostic ability makes it possible to communicate with students at an appropriate developmental level, to assist them in organizing a reference search that makes sense to them, and to match suggested reading material to their interests.

Student operations - concrete or formal? In Piaget's terms high school students will be using either concrete operational or formal operational thinking. Concrete operational thinking is characterized by "internalized
actions that permit the child to do 'in his head' what before he would have had to accomplish through real actions. It is also characterized by the ability to "think about things" and to deal with "the relations among classes of things." In contrast, people who have reached the formal operational stage have the ability to "think about thoughts, to construct ideals, and to reason realistically about the future." They can "reason about contrary-to fact propositions" and "understand metaphor" (Elkind, 1981, pp. 21-25).

It is important to note that the age at which one becomes capable of formal operational thinking has not been determined. Cognitive developmental psychologists are still working to clarify their understanding of formal operations and are even considering whether it might be more appropriate to describe thinking differences in theories rather than global stages. Even if the constructs of formal operations is accepted, it is becoming increasingly apparent that there is considerable variability within and across individuals in the manifestations of these thinking skills.

The difficulty is that some people (a very few) begin to think in this way (formal operations) at about age 11. Those students who develop formal operations usually do so at about age 15 (around grade 10). However, this level of thinking may not be used in all areas of a person's life. Hence in any classroom, even at the grade 12 level, a large proportion of the students will still be thinking in concrete operational ways" (Pace, 1987, pp.13 -14).
Developmental theory and the librarian. The use of developmental theory as a basis for librarian/student interaction is intended to facilitate instruction, not to restrict it. Although students performing library research need to be in the formal operational level of cognitive research (Kuhlthau, 1988) in order to work at higher levels of abstraction, this does not limit the use of the library for students who are apparently using concrete operations. These differences in student thinking operations mean that the educational problem from the librarian's point of view becomes one of assessing the cognitive level of the student -- concrete or formal -- and of devising appropriate educational responses. Elkind (1983) observes that:

... if teachers are aware of the level that young people have reached developmentally and use the appropriate strategies for instruction at that level, educational practice is likely to improve (Elkind, 1983, p.168).

For the librarian, a large measure of this awareness comes from what the student says during the initial stages of the reference interview. At this point in the process, the student can be engaged in a conversation marked by probing questions designed to provide clues to his/her level of cognitive development. The following dialogue serves to illustrate this point.
The student begins the process by asking for a book on raccoons.

L: "Is this for a school project?" ("Yes" means a certain kind and amount of information is required by the teacher and must be taken into consideration. "No" means it is the student's own interest which defines the amount and kind of information required.)

S: "Yes, I have to do a research project for Mr. Maloney's English class." (The librarian notes that this is a school project with existing parameters. The identification of the particular teacher indicates grade, course, and possible cognitive level of the student. In this instance, the student is in a College Level Freshman English Class. This placement indicates that he may be capable of abstract thought.)

L: "How big does this project have to be?"

S: "Five pages."

L: "How many sources?" (This information tells the librarian the parameters of the assignment. It also can be indicative of supposed ability of the student. Teachers assign larger research projects to the classes that they have judged to be the most able.)

S: "Three and one encyclopedia."

L: "What made you choose raccoons?"

S: "I'm just interested. Actually, one got into our garbage last night."
L: "Is this report on the information that you can find or do you have to have a thesis?" (This subject does not lend itself readily to a thesis. In high school writing, a thesis is considered to be the statement of a paper's intent, a statement of purpose. It presents a point of view that is supported by the facts of the paper. The student will have to work to overcome a natural tendency to merely amass a collection of raccoon facts.)

S: "What's a thesis?"

L: "Basically, the point of your paper. You make your point by supporting it with facts about your subject."

(The response provides information to the student concerning the definition of "thesis." It also is meant to suggest that a paper should present more than a listing of facts and that information is meant to be used to support an argument or defend the point or idea that is the paper's thesis.)

The student's response at this point is a reasonable indication of the level of cognitive development. Students who can think using formal operations usually understand the concept of thesis and respond by either changing the topic to one that is more amenable to a thesis or by an answer such as "I want to do raccoons. Maybe I could write about them as being pets." There is a potential of a thesis statement in this idea which can be developed with the student through further discussion.
Concrete thinkers will listen to the explanation of thesis and repeat: "I want to do raccoons." (It is possible to almost see a mental rigidity on the part of such students. They are not interested in other possibilities and, if questioned, will not understand the problem of remaining at what Stripling and Pitts have described as the "fact-finding level" (Stripling & Pitts, 1988). Asking this student what he wants to say concerning raccoons usually leads to repetition.

At this point, the librarian will have two different research alternatives. The concrete thinker will need to research the basic facts about raccoons in general encyclopedias, wildlife encyclopedias and natural history stories as facts are his/her particular area of cognitive competence and interest. The abstract thinker will be able to widen the search to include a broader range of materials involving the environment, animal rights, wild animals as pets and ecology. They will be using their ability "to coordinate multiple sources of information or logical rules" (Pace, 1987, p.14).

The same basic research question has produced two sets of informational needs leading to different search strategies and ultimately to different sources of information. Most importantly, each student will be successful.

The process of moving from concrete to formal operations can be encouraged through questions that demand a higher level of thought. Elkind's (1983) discovery strategy
which makes the familiar unfamiliar can be employed by asking a question that puts the student's request in a new light. For instance, the student presumed to be at the concrete level of operations might be asked why he thought a raccoon would make a good pet. This perspective could break the fact-finding set of the library research, causing the student to consider the more abstract idea of raccoon behavior.

Stripling and Pitts (1988) have provided lists of verbs corresponding to a hierarchy of thinking and research levels. For instance, students asked to "describe" will normally respond at a lower cognitive level than those who "analyze." A complete listing of these verbs and their corresponding thinking and research levels can be found in Appendix D. These words can be deliberately used to pose questions to students intended to raise the cognitive level of their thinking.

**Affective Influences on the Library Process**

The affective aspects of library research influence both students and librarians. Students in the process of library research experience a variety of emotions. In addition, they may be either intrinsically or extrinsically motivated.

Librarians need to acknowledge these feelings and offer the necessary reassurances (Kuhlthau, 1985b). They must
also monitor their own reactions, making sure that prejudice on their part does not interfere with the educational process.

Affective aspects of library research. Research indicates that the process of researching and writing a paper elicits emotions in students that can range from uncertainty through anxiety to elation and relief. Studies of high school students by Kuhlthau (1985a, 1988, 1989a, 1989b) have identified the different emotions felt by students at each successive stage in the research and writing process.

From this perspective, the process of writing papers and doing research is seen as carrying its own emotional baggage. The beginning steps in research are marked by feelings of confusion, frustration, and doubt.

Even when students know how to use the library and are familiar with sources, anxiety is common at the beginning of a project requiring extensive information use (Kuhlthau, 1989b, p.225).

These early, uncomfortable feelings are replaced by optimism as the student chooses a research topic. Having made the choice of a broad topic, the student must now begin to narrow the topic and thereby create a research focus. This activity leads to feelings of confusion which are replaced by a sense of direction and increasing interest as the focus of the research is determined. This choice directs the information collection stage which is marked by
a sense of direction and confidence. The search closure is marked by relief and a sense of satisfaction or a feeling that something is missing (Kuhlthau, 1985b).

The emotions associated with performing library research are significant in terms of academic success. Confident students produced more focused papers and received higher grades. However, no correlation between confidence and the number and variety of sources used (Kuhlthau, 1989b). The study did not extend its conclusions to lower-level students because their poor attendance rate made follow-up difficult. The only notable difference between the high- and middle-level students was that the high-level students received higher grades. The flow of feelings was comparable.

Learning to manage feelings is an important aspect of the library research process. The existence of these feelings and their relationship to research needs to be acknowledged and communicated to the students.

Once students expect to be confused when they first explore their topics, they can tolerate their uncertainty . . . learn that the disquieting unpleasantness of their feelings must be endured temporarily . . . (Kuhlthau, 1985b, p.55).

Students can be helped through the uncomfortable stages of research through the elimination of as much unnecessary confusion as possible. For this reason, it is important to create a well-organized, clearly labeled library. Signs designating the different areas of the library should be clearly visible, directions for the use of an index should
be posted near that index, and the lists of titles of periodicals, microfilm, or other library resources be readily available.

In addition, librarians can remain accessible by placing themselves physically within the group of students. This action encourages students to ask questions and begin the reference interview. It also provides an opportunity for the librarian to observe the students at work and to offer assistance if this appears to be necessary.

Finally, questions may be used to help students clarify their thinking and determine a focus for their paper. Reaching this point in the research process should bring a sense of direction and increasing interest (Kuhlthau, 1985b) which will enable them to complete the work.

Understanding the emotional dynamics of research makes it possible for librarians to empathize with their student researchers and to assist them in managing their emotions.

It is helpful for students to realize that a certain amount of confusion and indecision is to be expected. With guidance they can learn to tolerate their uncertainty . . . (Kuhlthau, 1985b, p. 31).

Librarians who are aware of these feelings can take steps to help their students alleviate them. This can be done during the reference interview by asking questions designed to help students clarify their own thinking and by helping them to identify for themselves potential sources of information.

Students should be given the opportunity to think the
problem through with as little assistance from the librarian as possible. This helps them to develop feelings of project ownership and confidence in their own abilities. Polya has some very sound advice in this regard. He says that:

The student should acquire as much experience of independent work as possible . . . left alone with his problem . . . he may make no progress at all . . . the teacher should help, but not too much and not too little so that the student shall have a reasonable share of the work (Polya, 1957, p.1).

Helping students develop feelings of confidence has practical as well as personal implications:

. . . the way students go through the search process affects the product they present at the end . . . the more student confidence rose during the process, the more focused their paper and the higher their grades were found to be (Kuhlthau, 1989b, p.226).

The judgmental aspect of librarianship. Librarians do not have many opportunities to know students very well and yet, to be effective, they must become judgmental. What other way is there to carry out our necessary and instant assessments of other people except by making judgments based upon their appearance, body language, and conversation?

In our society, the word "judgmental" carries heavy negative connotations. This sense can be somewhat ameliorated when the concept of judging - or classifying - is considered in the light of cognitive psychology.

As we know, the world is infinitely varied.

In order to deal with this infinite variation, we must segment the world into conceptual classes within which nonidentical stimuli are treated as
equivalent. Then new events, objects, and people can be identified as members of these classes and assumed to have the properties of these classes" (Howard, 1983, p. 480).

Our classification of the world allows us to function; it also can create problems if its associated process of hypothesis testing does not function to test the truth of our assumptions. As Howard says:

This strong propensity to formulate and test hypotheses is useful, but it is not an unmixed blessing. Dogged persistence with incorrect hypotheses can prevent us from discovering actual regularities in the world . . . The difficulty, of course, is that the hypotheses we adopt influence the direction of our attention and what we remember, so an incorrect hypothesis or an inadequate hypothesis pool may prevent us from finding an adequate solution (Howard, 1983, p. 497).

These ideas from cognitive psychology have direct implications for the librarian who must deal with students on the basis of assessments and classifications which frequently are made in a short time period. These classifications may carry emotional overtones which interfere with the educational process, particularly if there is a general fear or dislike of a student who has been categorized as "indifferent" or "bad."

Although it is necessary to assess students in order to function, it is equally necessary to bear in mind that these assessments are based upon classifications or stereotypes. Depending upon personal schemas, these assessments can cause positive or negative reactions to that student.
Furthermore, it should be remembered that these classifications are subject to a hypothesis testing process that may be flawed.

In short, librarians assuming a teaching role should be prepared to make educational assessments and to change them if necessary when new facts arise. Flexibility and openness to new information are the keys to conducting successful student interviews.

**Classification of students.** People categorize students according to their clothing, appearance, behavior, verbal and non-verbal language, and reputation.

Two broad classes of students have been identified as "jocks" -- those students who have bought into the school and "burnouts" -- those students who have disassociated themselves as much as possible from the entire educational process (Eckert, 1989). Students symbolize their affiliation with a particular category in a number of ways including their territorial hangout in school and whether (and what) they smoke (Eckert, 1989). The symbol that is most readily apparent to librarians is that of clothing.

Clothing is a particularly powerful social marker because it is regularly renewed and never separated from the individual in public situations. Just about every category of external clothing has indexical or symbolic value in the category system (Eckert, 1989, p.62).

"Jocks" wear expensive clothing, often with designer labels. They adopt the mainstream fashion of their parents. "Burnouts" dress less expensively and have a less extensive
wardrobe. They choose working class styles.

While Jocks wear polo shirts, button-down shirts, and crew-neck sweaters, Burnouts overwhelmingly wear rock concert T-shirts. These T-shirts have the double symbolic value of displaying lack of means and of advertising the Burnout taste for hard rock. Burnouts girls wearing sweaters do not sport the "preppy" look of woolen crew necks, but opt for patterned sweaters frequently made of synthetic materials.

The most richly symbolic element of Burnout upper body wear is the jacket. The Burnouts signal their peripheral relation to the school -- the fact that they are "just passing through" -- by wearing their jackets all day in school (Eckert, 1989, p. 65).

A student's class affiliation indicates his/her purposed relationship with the adults in the school. By participating in the school's educational and extracurricular programs, "jocks" support the existing educational system. They believe that success in school leads to opportunities and success in later life. Consequently, they do their homework and support school activities. Teachers view them as co-operative.

In contrast, "burnouts" who see no particular advantage in participating in the school's programs and consequently become only marginally involved in school life are seen as alienated and rebellious (Eckert, 1989).

It is no wonder that for most middle-class adults who are the school's administrators, teachers, and librarians, it is easier to have initially cordial feelings towards "jocks" who have accepted the system and are willing to negotiate good behavior for good grades. Feelings towards "burnouts" may often be negative as these students enter a
classroom or library with body language and clothing that signal their rejection of school and, by implication, its adults.

Our initial responses to each of these students can color the resulting interaction. Negative effects can happen in both instances. The very co-operativeness that makes "jocks" a pleasure to have in class can make it easy for them to slide unchallenged through the educational process. These students can produce pages of well-organized, neatly written, assignments that never rise above the level of cognitive mediocrity while receiving an "A" for neatness. The challenge in addressing these students lies in helping them to discover that although they are doing well by the school's standards, they still must learn how to break set, problem solve, and effectively manipulate opposing ideas. As potential future leaders of established society, they must learn to think critically. As good students, they have the opportunity to practice this skill.

Librarians can assist in part by guiding them through research that leads to resources that present opposing points of view, describe lifestyles different from their own, or analyze society and its problems. For instance, a "jock" researching the Boston Tea Party could be led to resource materials that present the British as well as the American viewpoint. During this process, the differences in the language can be identified. It could be noted that these same people described as patriots by the American writers become a mob according to the British. The unstated
goal of this lesson is to encourage them to go beyond a simple acceptance of the status quo through the development of an understanding of the ways in which society can manipulate the attitudes of its citizens through language.

"Burnouts" present a problem in basic human relations as it can be difficult to establish rapport with someone who has bought out of the educational system. However, one of their great strengths lies in their ability to establish warm relationships with other people (Eckert, 1989). The "burnout" trait of being a "people person" offers a point of connection between adult and student which can be made by friendly eye contact and expressing interest in the student as a whole. For example, asking a "burnout" about the concert or rock group on his T-Shirt is one way of establishing a warm background tone for the rest of the reference interview.

Librarians who have a genuine appreciation for the abilities or potential abilities of their students and are not put off by styles of dress or other adolescent trappings of behavior should be able to establish the necessarily cordial background context for the reference interview. This supportive social context provides the necessary setting for the teaching of thinking skills.

Setting the proper conversational tone also involves a conscious effort to relinquish control and place the student in charge of the homework project. This is a means of increasing intrinsic student motivation, an important element in the success of the assignment.
Extrinsic vs. Intrinsic Motivation

Amabile's motivational studies reveal the importance of intrinsic motivation to student success in school. Her basic thesis that "the intrinsically motivated state is conducive to creativity, whereas the extrinsically motivated state is detrimental" (Amabile, 1983, p.91) is particularly applicable in the school library as a majority of students arrive at the library in response to a homework assignment. They are extrinsically motivated.

Using Amabile's theory a basis for designing an educational technique, it may be assumed that students will be more creative in their approach to the assignment and potentially more successful in their work if they can become intrinsically motivated. It has been my experience that intrinsic motivation can be encouraged by helping students to feel a sense of ownership towards their research project.

Developing a student's feeling of project ownership can be difficult when the terms of the assignment have been set by the teacher. This sense may be fostered by the librarian asking the student about the nature of the assignment, the area that the student would like to research, the aspects of the subject that he/she finds interesting, and the subject areas that he/she thinks would provide source material.
This exchange places the student in charge of the project and provides an opportunity for the librarian to assist the student in planning an approach to the research. It is done by the librarian asking leading questions, rather than providing answers.

This approach places the student in charge of his own learning. Polya says that a "student should acquire as much experience of independent work as possible" (Polya, 1957, p.1). Librarians teaching the research process can give their students this sense of independent work by encouraging them to find their own information.

A student frequently begins the reference interview by asking if the library has any information on a particular subject. He/she has the general expectation that the librarian will simply hand them the necessary material. The librarian's first step in teaching is to give control of the research back to the student. This action is not intended to leave the student alone because "if he is left alone with his problem without any help or with insufficient help, he may make no progress at all" (Polya, 1957, p.1).

Although help is available, it should be realized that part of the message that gives students control of their own research also tells them to work on their own. This message has to be communicated carefully or students may feel rejected. An effective approach is for the librarian to adopt a non-accusatory manner and simply inform the student that part of what he/she does as a school
librarian is to teach students how to use the library and that it is a teaching objective that all students learn how to do this.

This statement can be followed by asking the student what he/she knows about libraries. A question such as this, that can be answered only by the student and to which there is no right or wrong answer allows the student to begin to feel in control of the situation. In turn, the librarian can use this information to assess the amount of help to provide the student. Students who are familiar with libraries and their organization often need only a little prompting while sometimes a great deal of help is necessary. In this case, if the student is not able to do much, the teacher should leave him at "least some illusion of independent work" (Polya, 1957, p.1).

Playing games by creating this illusion may be necessary, but it is not ideal.

The best is, however, to help the student naturally. The teacher should put himself in the student's place . . . see the student's case . . . try to understand what is going on in the student's mind and asked questions or indicate a step that could have occurred to the student himself . . . (Polya, 1957, p.1).

Creating a Thought Conducive Climate

Costa (1985) has identified teacher "response behaviors" that occur after a student has answered a question or taken directions as having the effect of either terminating or supporting thinking. As teacher response
determines the thinking climate, it is necessary to understand the nature of these behaviors and their influences on the educational process.

Responses that terminate thinking. Behaviors that terminate thinking are criticism and, rather surprisingly, praise. Criticism makes people feel failure. Praise "builds conformity at a time when our goal is diversity. It tends to make students depend on others for their worth rather than on themselves for their worth" (Costa, 1985, p.132). Although praise is appropriate in some instances, students should be taught to develop their own inner motivational systems.

Rewards are best administered for well-learned tasks where specific rules need to be followed, as opposed to tasks that are in the process of being learned or are problem solving or exploratory in nature (Costa, 1985, p.132).

Librarians have to be particularly careful in their use of praise as library research clearly falls into the task category of problem solving. Students who have done well may be led to this realization through questions that ask them to assess their work. Since they are, in fact successful, this will become evident in their evaluation.

Responses that support thinking. Responses that support thinking are described by Costa as open or extending. These include silence, acceptance which may be passive, active, or emphatic, and clarification of the student's concept and processes.
Research (Tobin, 1987) indicates the importance of silence within dialogue. This silence is called "wait time" and is defined "in terms of the duration of pauses separating utterances during verbal interaction" (Tobin, 1987, p.69). This is the "time between a teacher's questions and a student's answer or between a teacher's first and second questions (Christenbury and Kelly, 1983, p.8).

It has been found (Tobin, 1987) that wait times of more than three seconds result in changes in the student/teacher dialogue and in higher levels of cognitive achievement. Increased wait time is not proposed as a simplistic solution to the problem of improving instruction. Instead,

when the purpose of . . . discourse is to stimulate higher cognitive process, teachers should utilize an average wait time of between 3 and 5 seconds. An extended teacher wait time should be viewed as a necessary but insufficient condition for higher cognitive level achievement (Tobin, 1987, p.91).

Dillon (1988) describes waiting as an act of patience. It produces a deliberative, appreciative silence. It is the author's feeling that this silence communicates a sense of respect for the student's capabilities to that student. It signals the expectation that the student is capable of providing the answer while it allows the student the time to think. Additionally, should the student need some help, it seems to creates a collegial tone between student and librarian that makes it possible for the student to accept suggestions without feeling defensive.
Costa (1985) characterizes accepting responses as nonjudgmental and supportive of a psychologically safe climate in which students may take risks. This is relevant in library research as there are no single right answers and students must feel free to explore and reject possibilities.

Passive responses simply demonstrate that the student has been heard with no value judgment being made. They are useful in the creative stage of library research when the student is verbally mulling over possible topics. At this point, the student should be generating ideas without pausing to evaluate them as an active response could interrupt the train of thought.

Active acceptance demonstrates an understanding of what the student says. It occurs when "the teacher extends, builds on, compares, or gives an example based on the student's response" (Costa, 1985, p.133). The response can be at the focus formulation point in the research process. By restating the research problem, the librarian determines the validity of his/her own understanding of the student's research intentions. This helps to ensure that, despite their differing roles, both librarian and student will be working on the same research problem.

If the librarian cannot restate the problem correctly, this indicates a need for more information. In responding to this request, the student must elaborate. This verbalization can lead a student to clarify his/her own thinking and to establish possible sub-topics for the report.
Empathic acceptance is "the acceptance of feelings in addition to cognition" (Costa, 1985, p.134). This means the acknowledgment of the feelings associated with library research as used as a basis of establishing student rapport. "You wish to help a student; what you say to your student should proceed from a sympathetic understanding of his difficulties " (Polya, 1957, p.148).

Conclusion

"Thought and action are most meaningfully and comprehensively understood as having both cognitive and affective contributing factors" (Gallo, 1990, p.100). In library research, student developmental level determines the degree of abstraction found in the reference interview, in the focus of the paper and in the final project. The librarian's awareness of a student's emotional state makes possible an empathic response to the student which in turn can lead to actions to reduce uncomfortable feelings associated with research. Finally, these understandings are used to develop librarian/student dialogues designed to teach critical and creative thinking.
CHAPTER VI
MODEL DIALOGUES FOR THINKING SKILLS

Introduction

The model dialogues that are being proposed as teaching techniques in the library research process rely heavily on the method of questioning.

Since communication is an essential of teaching, and questioning is an integral part of classroom verbal interaction, to a substantial degree teacher effectiveness is affected by questioning skill (Wilen, 1982, p.25).

The information gleaned from research on classroom questioning techniques can be applied to the librarian/student dialogue as well. The application of this knowledge is shown by example in this chapter which concludes with model conversations between a librarian interested in teaching thinking skills and a range of hypothetical students who represent a variety of interests, attitudes, and emotions.

Role of Questions in Library Interviews

Questions in educational practice. Asking questions is a natural part of education. "Questions are the intellectual tools by which teachers most often elicit the desired behavior of their students" (Costa, 1985, p.126). While current research centers on the use of questions in the classroom (Wilen, 1987; Dillon, 1988), at least some of the findings have direct applicability to conversations between
individuals. These include general statements concerning
the role of questions in the educational process,
questioning hierarchies, and the role of wait time
(Christenbury and Kelly, 1983).

Questions. Questions can

provide students with an opportunity to find out
what they think by hearing what they say . . .
Allow students to explore topics and argue points
of view . . . Allow students to function as
experts . . . Give the teacher immediate
information about student comprehension . . .

These statements readily apply to dialogue. Giving
students an opportunity to verbalize their thoughts often
leads to clarification of their ideas. "Clarifying means
that the teacher does not understand what the student is
saying and, therefore, needs more information" (Costa,
1985, p.134). Asking students to clarify stimulates
critical thinking (Christenbury and Kelly, 1983).

Topics can be explored verbally before becoming
invested with time, energy, and the work involved in
writing. This encourages fluidity of thought and a
willingness to explore alternative possibilities.

Students who function as experts are in charge of their
projects. This encourages the intrinsic motivation that is
necessary for a successful completion of the task (Amabile,
1980).
Finally, student answers provide feedback. They indicate the student's understanding of the research as well as his/her state of mind. These responses are used as a basis for the librarian's next response.

**Questioning hierarchies.** The notion of questioning hierarchies is very similar to the taxonomy of thoughtful reactions described by Stripling and Pitts (1988). Implicit in the use of these lists is the assumption that:

certain kinds of knowledge - and the answers to certain kinds of questions - are considered superior to, more sophisticated than, or requiring higher cognitive skills than certain others (Christenbury and Kelly, 1983, p.4).

Research findings as summarized by Christenbury and Kelly (1983) and Wilen (1987) indicate that the use of higher-order questions by teachers does not necessarily produce a matching student response or an increase in student achievement. Wilen (1987) suggests that more research is needed to establish its effectiveness. Meanwhile, the use of hierarchies to construct questions remains a useful technique in certain circumstances as long as teachers remain aware that it does not necessarily result in student use of higher thinking skills (Christenbury and Kelly, 1983).

Librarians posing higher-order questions to student researchers should be aware of the inconclusive nature of this research. Attention must be paid to the student's response. If it matches or approximates the level of the question, then it is reasonable to assume that higher-order
thinking has occurred. If the response does not match, then it is necessary to tailor the conversation to the appropriate level while attempting to lead the student to a more abstract level of thought.

Research questions. The reference interview itself begins with a question usually phrased "where do I find . . .?" In fact, question handling has been identified as the major function of reference service. The process is called question handling, rather than question answering, because every question received by a reference librarian is mediated. Mediation implies that the librarian will make a series of informed choices on behalf of the client (Robinson, 1969, p.51).

In school libraries, which are involved in education as well as providing information, this choice means teaching the research process and its associated thinking skills to the students. It involves passing the responsibility of research back to the student through carefully designed questions created at the time in response to the demands of the particular situation and student.

Dialogue Models

Ideally, each reference interview would permit the teaching of all of the appropriate thinking skills. In reality, this happens only when the librarian teaches a library science unit. Occasionally, an interview lends itself to the presentation of all of the skills. More commonly, one or two thinking skills are taught at one time.
It is the librarian's assessment of the student that determines the nature of responses made to the student, the questions posed, and the thinking skills that are taught. It is also the librarian who creates the atmosphere to support thinking as described by Costa (1985). In these interviews, the librarian's role is to teach thinking skills within the research process.

The following dialogues represent hypothetical reference interviews that take place between a high school librarian and five different students. The student profiles are developed to represent a range of student abilities, interests, and information requests. They are drawn from life and represent very real types of people.

The method of presenting a series of interviews using a variety of personality types is used as a means of demonstrating the application of critical and creative learning theory in specific, yet fairly typical, instances. An alternative way of modeling the teaching of thinking skills would have been to develop a dialogue based upon each skill or a related cluster of skills. However, as it is the supposed nature of the student that ultimately determines the lesson that is taught, it was decided to base the models upon student types. This plan reflects the inherent structure of the situation.

The types of students represented are "jocks" and "burnouts." Although there are many students who do not strictly fall into each category, these student classifications can be used to indicate a general
relationship to the school. For this reason, the "jocks" include an Honors student, an athlete, and an artist. Artists are not "jocks" in the strict sense of the term, but they do maintain school affiliations through their association with the art and music clique. The "burnouts" presented are a non-reader and a "skin-head." Names and sex have been provided solely as a writing convenience and carry no sex-linked implications concerning student behavior.

In these models, the parenthetical comments are meant to indicate the librarian's thoughts and reactions. It is hoped that other school librarians will generalize from these examples and will use these questioning methods in their own reference interviews.

**Case No. 1**

<table>
<thead>
<tr>
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<td>Motivational state:</td>
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<tr>
<td>Cognitive development:</td>
<td>Formal</td>
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<tr>
<td>Social background:</td>
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<tr>
<td>Research problem:</td>
<td>Narrow choice of resources</td>
</tr>
<tr>
<td>Topic:</td>
<td>Relationship between the French Rights of Man and the Bill of Rights</td>
</tr>
<tr>
<td>Thinking skills:</td>
<td>Devise research path; list attributes; evaluate and rank alternative; evaluate sources</td>
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</tbody>
</table>

Shana is a fifteen-year old female student in academically talented classes. A "jock," she is a member of the majorettes, class secretary, and a yearbook editor. She
is neatly dressed in a yellow sweater with matching skirt. She is intrinsically motivated, capable of abstract thought, and has chosen a challenging topic.

Shana is doing a project on the relationship between the French Rights of Man and the American Bill of Rights. Since this indicates an ability to think about ideas, her choice of topic indicates that she thinks on the formal operational level.

The reference interview should enable her to identify and select relevant and reliable sources from two very broad areas of American and French history. Her problem is that of finding too many sources, rather than too few. She must think critically to make reasonable judgments concerning the relative value of each source.

S: How many books can you take out? I've looked in the card catalog and found all of these. (She has written down the call numbers of all of the library's books on French and American history).

L: Well, looks like finding information isn't going to be a problem. What are you doing and which of these do you think that you will need? (This response gives verbal acknowledgement to the fact the student is doing the research and has the choice of resources to use. It encourages ownership.)
S: I'm doing a comparison between the French Rights of
Man and the American Bill of Rights. It's for the
Hodsworth. (This is a state history contest. This student
is in an honors class. It is reasonable to assume that she
can handle the abstract nature of the topic.)

L. What is the time period? (It may be assumed that
at this point she is feeling the confusion and anxiety that
frequently accompanies the beginning stages of research.
Her overly long list of possible materials indicates that
she has no focus for her paper as yet. She needs to
determine the criteria for book selection by clarifying her
research problem. This clarification will allow her to
identify the pertinent resources. The thinking skills
needed to accomplish this task are the ability to identify a
general problem, to clarify the problem, to formulate
appropriate questions, and to identify alternatives.

She was asked a question that could be easily answered
in order to increase her self-confidence and to demonstrate
one method of narrowing her search - by time period.)

S: Late eighteenth century. (As this is said without
hesitation, it indicates she knows something about her
subject.)

L: You've found so many books. How do you think you
can eliminate some of them? (This response suggests to the
student that she needs to think more critically. This means
she must identify the central issue of her research,
identify and rank the alternative sources of information,
and choose the best. In order to do this she must develop criteria for choosing her resources. One method, narrow by time, has already been mentioned.)

S. Well, the books have to be about French and American history, the revolutionary period, the men involved, the Bill of Rights, the Rights of Man, the Constitution . . . (She has spontaneously used creative thinking to generate a possible list of criteria.)

L: Let's see where that information is in the books. (Goes with Shana to shelves, as the next step in the teaching procedure is to demonstrate how a proper examination of the sources makes it possible to choose the most relevant ones.)

L: Here, I'll check the indexes in these American History books for BILL OF RIGHTS. You do the same for RIGHTS OF MAN in these French books. (Working together in this way, the librarian can demonstrate this approach as the student practices the same technique while under supervision. The search yields several books in each category.)

S. This looks too easy. (She is holding an easy-to-read history text.) I need more information than this.

L. How much do you information do think you will need? (This is a request for clarification. It is intended to help the student focus on the facts that she will need. This should enable her to confine her research to the most pertinent resources.)
S. I need to know who wrote it, why, and what its relationship is to the Bill of Rights. I need at least five sources. How can I tell which one might be good? (The student seems to have understood the concept of criteria and the necessity of evaluating sources.)

L. Try to find books written on an adult level, by an authority. The book jacket can help in some ways. Don't forget to check the index to see if the topic is covered and how much information might be available. You're the best judge of what you need. (These statements provide information on techniques while allowing the student to do the work using the criteria she has established.)

S. Here's a whole chapter on the Rights of Man. The author is a history professor, too. I think I'm all set. I'll check the indexes of the other books to see if the other topics are there.)

These responses again indicate that she has understood the concept of choosing resource material according to the guidelines of her topic. Using her own criteria, she is able to finish the search by herself.

Case No. 2

<table>
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</tr>
<tr>
<td>Social background:</td>
<td>&quot;Burnout&quot;</td>
</tr>
<tr>
<td>Research problem:</td>
<td>Find book</td>
</tr>
<tr>
<td>Topic:</td>
<td>No opinion</td>
</tr>
<tr>
<td>Thinking skills:</td>
<td>State goal, choose best alternative</td>
</tr>
</tbody>
</table>

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Jason wears a Motley Crue T-Shirt, a jeans jacket with a Grateful Dead skull drawn on the back, and jeans. Slouching into the library without a pass or a hello, he stands uncertainly in the middle of the room.

The librarian's first assessment is that this student is a burn-out who has little regard for school and its rules. This is based upon his clothing and his lack of a pass. However, despite these negative feelings, he has come to the library. The primary goal of this exchange will be to give him a positive library experience by making it possible for him to find a book. It is hoped that by setting a friendly tone to the interview, the student may begin to realize that libraries have something of value to offer. If this can be achieved, then he might come to the library more often.

The thinking skills involved in this exchange function in two areas: first, the student has to decide to read a book and complete his homework assignment; second, he has to choose between alternative book selections. There is a delicate balance in the conversational exchange. The author's experience has shown that if too much attention is focused upon the student's choice of reading material, the student feels pressured and leaves without a book. The thinking skill lessons tend to be inherent in the situation and remain largely unstated. The student is made to feel that his goal choice of finding a book is a wise one. It
often must merely be assumed that the thinking skills needed to assess the alternative book selections are used if the student chooses a book.

L: Hi! What’s up? (This is said with a smile and in a very friendly tone.)

S: Oh, I have to find a book for English. I hate reading. (Big sigh.)

L: You have company there. (This statement is intended to break set. It can be assumed that the student isn’t expecting a warm response.) What was the last thing you read? (This might be a starting place.)

S: Can’t remember. I didn’t finish it.

L: Can you think of something that you did like? (The student is being shown that his tastes are respected and that the librarian is interested in him.)

S: Not really. The Outsiders was pretty good. (Many students who hate reading mention this as one book they have liked. It tells a good story about people their own age on the outside of society. Knowing the qualities of this book provides criteria for suggesting other similar titles.)

L: Why don’t you take a look at these paperbacks and see if something appeals to you. (Most school librarians recognize the power of paperbacks to promote reading; they also know the types of books, like The Outsiders or Go Ask Alice, that appeal to people who don’t like to read. They then create a collection of such paperbacks and allow students to browse through the choices. The books themselves are not labeled as being easy to read.
or designed to appeal to any particular type of student. Since these paperbacks have been pre-selected for those who hate to read, this is a forced choice. The actual selection is left up to the student in an effort to encourage intrinsic motivation.)

S. Guess I'll take this one. (The student has examined, ranked, and chosen the best of the alternatives.)

L. Oh, Killing Mr. Griffin. That is good. I read it myself. Let me know what you think about when you're done. (This is intended to let the student know that his opinion does matter. In addition, it suggests to the student that he is expected to finish the book, providing additional motivation.)

**Case No. 3**

<table>
<thead>
<tr>
<th>Academic background:</th>
<th>College prep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivational state:</td>
<td>Extrinsic</td>
</tr>
<tr>
<td>Cognitive development:</td>
<td>Formal</td>
</tr>
<tr>
<td>Social background:</td>
<td>Art crowd</td>
</tr>
<tr>
<td>Research problem:</td>
<td>Find picture of Queen Hatshepsut</td>
</tr>
<tr>
<td>Topic:</td>
<td>Egyptian Queens</td>
</tr>
<tr>
<td>Thinking skills:</td>
<td>List attributes, generate detailed ideas, generate multiple ideas</td>
</tr>
</tbody>
</table>

Elizabeth is fourteen and in the college program. She has long brown hair and wears clothing that is reminiscent of the 1960's. An artist, she prefers doing work of her own choosing; however, she acknowledges the practical necessity of doing well in school and can be considered more "jock" than "burnout." Her motivation is extrinsic: she is doing her homework.
As the teacher has given a choice of format for the final presentation, she has chosen to draw a picture of an Egyptian queen as her history project.

The picture is not readily available; searching for it provides the opportunity to practice creative thinking skills. She must generate a variety of subject headings, requiring traits of fluency, flexibility, and elaboration.

S: Do you have a picture of Queen Hatshepsut?
L: Who was she? Can you tell me more about her? (The librarian isn't familiar with the name. By asking the student to provide more information, the student's authority is acknowledged and she is placed in charge of the project.)

S: All I know is that she was a queen in Ancient Egypt.

L: Where do you think we should start looking? (This sets the stage for the student's next step, generating a list of possibilities based upon her existing knowledge.)

S: Egypt?
L: Let's make a list of the possibilities. Got a pencil? Here's some paper. (This technique provides an opportunity for elaborative thinking.) What do you know about the subject?

S: She was an Egyptian.
L: When did she live? (This is a prompt leading to the subject heading of Egypt - History.)

S: A long time ago.
L: What's the word for a long time ago?
S: Sorry, I can't think of it.
L: It's a subject and you're taking it now. (This is said in a playful tone of voice meant to turn the generation of subject headings into a game.)

S: History! (She writes down "History" and "Egypt".)

L: O.K. So far we have Egypt, History - where else could we look? What else do you know about her? (The student is being shown her own knowledge. This should create in her a feeling of being capable.)

S: She was a Queen. I have seen her picture before in an Art Book. (She adds "Art" and "Queen" to her list.)

L: So, we can look under Egypt, Egypt-History, Ancient Egypt, Queens, Rulers, and Art. That gives you at least six places to start. (This is a response of active acceptance which summarizes the student's ideas. It demonstrates the value of her existing knowledge.)

Elizabeth notes the call numbers and proceeds to find several books on Ancient Egypt. The search ends with the picture being found in a book on Egyptian History that featured pictures of rulers. The thinking skill of elaboration has been used to identify the possible subject heading leading to this information.
Matthew is a "jock", an enthusiastic, year-round athlete who successfully participates in football, basketball and baseball. He tries to do well in his subjects in order to stay on the various sports teams and because he expects to go to college. Through working with him in the past, the librarian knows that he has a tendency to operate at the concrete level of operations and but can be coached to higher levels of thought. He arrives in the library after school on the way to basketball practice, wearing his warm-up suit.

The reference problem is complicated by the added pressure of time and the depleted condition of the shelves. He is late in beginning his research and other students have taken nearly all of the literary criticism books. The appropriate thinking skills to be taught in this instance are those of decision making. If his goal is to complete the assignment on time, he must identify the factors that will expedite this effort and evaluate his actions. At the same time, he must form a focus and evaluate resources.
Matthew approaches the desk after a fast rummage through the card catalog.

S. Got anything on authors? I need five sources quick because I have to get down to basketball practice.

L. Is this for a Marshman? (This is a major research paper in literature that all of the college and honors students have to write. The paper can be entered in the Marshman Literary Contest, hence its name. Many of the students thoroughly dislike this project as it is dry and the source material is frequently obtuse literary criticism. They approach the paper with anxiety.

To successfully write this essay, it is necessary to be able to perform formal operations. Matthew has a tendency to think in concrete operational terms. For instance, his last paper was a listing of the causes of the Civil War and did not analyze the causes. It simply presented them.

Knowing this, the librarian hopes that he can find an author that is both accessible and who can be discusses as various levels of abstraction. It is to be hoped that Matthew will begin with the more obvious details and progress to the more abstract information as he begins the reading for his project.)

S. Yes.

L. Isn't the bibliography due Friday? (This is Wednesday. He could be in a panic.)

S. I'm afraid that it is. It's basketball season and I haven't had any time to work on it.
L. I think that there is something left. Let's go look. (This student needs reassurance. Besides the normal state of confusion and anxiety that accompanies research, he has left himself little time to do the work.

In this case, the student is going to be sent directly to the shelves as the literature collection is depleted. His behavior has demonstrated that he is minimally familiar with the card catalog. His manner indicates that he is in a hurry. The librarian knows that it is pointless to begin a list of call numbers as many of the books have been taken. The techniques of browsing shelves for information will be demonstrated.)

L. What were the call numbers for the literature section? (The positive answer to this question will demonstrate to Matthew that his work and time has not been wasted. It also places him in charge of the research.)

S. 801, 910.

L. Do you have any author in mind? (This response should reinforce his sense that this is his project.)

S. Not really.

L. Why don't we go to the shelves and see what is left? (This is realistic and fair. The librarian is fully aware that the shelves are depleted. This can be an opportunity to model the technique of browsing. Once at the shelves, they scan the available titles, looking for connections between sources.)

S. Here's one book just on Hemingway. Would that be all right?
L. How many sources do you need? (The student has used the available resources to form his research focus. This follow-up statement is intended to remind the student of the number of acceptable sources.)

S. Five.

L. Are you able to go to other libraries? (If the student can go to other libraries, the number of sources available in this library is not particularly relevant.)

S. No. I don't have the time. I can only use this library. (The student has been led to recognize a potential obstacle to the successful completion of the assignment.)

L. Well, what we see is what you can use. Let's start looking. (Assisting the student is meant to reduce stress and allow him to think about the kinds of information he needs.)

S. There is only one book called Hemingway. Now what?

L. Are there other books that might have something about him? For instance, here's a book on nature in American literature. He might be in the index. (This suggests a route to follow.)

S. You mean I have to look in all of these books? I have got to get to practice.

L. Why don't you try the ones that you think will deal with him. What do you know about him? (This question enables the student to discover his criteria for choosing books.)
S. He was an American who wrote novels about bullfights and war. He is fairly recent.

L. Look for titles that suggest those topics and then check the index to see if he is included. (The student is provided with cues as to the procedure. He is encouraged to do the work on his own using this information.)

S. Here's one on war authors and another on contemporary American authors.

Matthew now has three sources. This is a good start. He can return to the library on the next day to find the remaining two sources.

\[\text{Case No. 5}\]

- **Academic background:** College prep
- **Motivational state:** Intrinsic
- **Cognitive development:** Formal
- **Social background:** "Burnout"
- **Research problem:** Find supportive information for controversial topic of Satanic worship
- **Topic:** Satanic worship
- **Thinking Skill:** Identify central issue

Joe has shaved his head. He wears seven silver earrings in one ear-lobe, a marked contrast to his battle fatigues and combat boots. His name appears frequently on the In-School Suspension List and last year he was arrested for drug-dealing at the school. His look is defiant and antagonistic, while his eyes sparkle. The initial assessment is that here is a bright trouble-maker who feels that he is the victim of prejudice and is out to prove it. Underlying the entire transaction is the sense that he wants to shock the librarian by asking for books on an anti-
Christian subject. The goal of the librarian is to show him that information is neutral and he is not so terrible, after all.

As is often the case, the thinking skills taught in this dialogue relate to an evaluation of attitudes as much as to library materials. It is fairly obvious that the student has clouded his choice of topic with a desire to be outrageous. If he is to do well on the assignment, he must focus on his topic.

S: Got anything on Satan?
L: Is this for a school project? (A simple request for information reduces the shock value of the request.)
S: The history class is doing the Bill of Rights and I'm doing freedom of religion.
L: Try looking in the card catalog under "devil" and "religion." (The message sent is that card catalogs do not discriminate. This also provides practice in using the catalog.)

Joe heads to the card catalog. The librarian heads for the Encyclopedia of Religion. Joe returns with a list of correctly written call numbers. He looks at the list and walks to this section of the library. This is proof that he has paid attention in school despite his reputation and that he needs no further lessons in the mechanics of libraries. He returns with one book on the devil.

L: Good. I was afraid that there would be nothing left. (Message: I'm on your side.) You might be interested in these chapters in this encyclopedia and this book on
Supreme Course decisions. (This tells him that information is available on any topic. Libraries are non-judgmental.)

Joe reads the chapters on Satanic Worship. His air of defiance has vanished. He xeroxes the chapters, checks out the book, and leaves. He later returns the book and switches his search to the Christian Science Religion.

In this case, the librarian's deliberate choice of a non-judgmental posture enabled the student to consider his subject more carefully. It is interesting to note that the potential for an excellent paper on freedom of religion that was inherent in his first request was obscured to him by his ulterior motives. For him, the identification of the central issue involved his motivation, not the ramifications of religious tolerance.

Conclusion

The preceding dialogues are meant to model typical reference interviews integrated with appropriate and related thinking skills. They are intended to demonstrate the application of educational and psychological theories in practical situations and to illustrate the ways in which the reference interview may be integrated with thinking skill lessons.
CHAPTER VII
REFLECTIONS

Summary

This thesis presents a synthesis of information taken from the fields of psychology, education, library science, and critical and creative thinking. The model dialogues are meant to provide examples of the practical application of theory in a very specific instance -- the library reference interview. These models were drawn from my fifteen years of experience as a school librarian.

During the past two years, I have deliberately tried to practice the questioning techniques presented here. As my previous training had been in traditional librarianship, it took practice to develop an interview technique which involved the teaching of thinking skills.

Old habits are hard to break; it is more expedient to simply point in the right direction or to hand books to students. In addition, this technique demands a fair amount of psychic energy in order to develop the dynamics of the interview. To be successful in this approach, it is necessary to deliberately assess someone else's state of mind, attitude toward school, willingness to work, intellectual abilities, and interests. Mere physical presence is not sufficient. The nature of this kind of conversation requires an emotional and mental focus, a sense of the present that can be draining.
It can also be fun. When the technique is at its best, there is a sparkle to the conversation that adds pleasure to the work.

My sense is that this technique is effective. In most instances, students are quite receptive. If asked, they are quite willing to generate subject headings, skim book jackets for author evaluations, and check the index to see if the resource would be of value to their paper. When wait time is deliberately created, students had answers.

It seems reasonable to believe that in this one instance at least, students do receive thinking skill practice, experience an increased sense of project ownership, and conduct more focused research. Students interviewed in this way seemed to spend more time on their research during the class period and less time visiting with friends.

I believe this technique to be valuable and one that other school librarians might want to adopt. This sense of success has also generated a series of questions that indicate the need for additional research.

**Issues of transfer.** Students who participate in reference interviews integrated with appropriate thinking skills appear to be better thinkers during the course of the interview. For instance, the idea of listing the attributes of a subject or evaluating the usefulness of resources is readily accepted and put into practice at the time of the reference dialogue. The unanswered question is: will these
thinking techniques be used in subsequent research projects?

One way to determine this would be to interview students who had participated in these dialogues at the time of their next research project. Among other things, students could be asked to describe their approach to research, the problems they identified, and their reasons for choosing particular sources. An alternative to the interview approach would be the development of a student questionnaire.

A related issue is the relationship between successful research and success in school. If students become successful at research, does this success raise their overall level of academic achievement? If so, to what extent? What is the connection?

One way to evaluate the overall effectiveness of this teaching technique might be to interview teachers after their students had participated in the dialogue. The goal of this interview would be to discover whether the teachers had noticed any difference in the quality of the written work or in student responses to subsequent assignments.

Affective issues. To what degree can awareness of the negative feelings associated with library research enable a student to overcome these feelings? Students who were informed that feeling of confusion are a natural part of the research process seemed to relax and begin to focus their attention on their research. A qualitative study based upon
students reports of their research process could indicate the importance of this piece of information to the success of their overall project.

The importance of a supportive research atmosphere has been stressed. It would be interesting to discover what constitutes a supportive atmosphere from the student's point of view. This could be done through a simple questionnaire or through interviews.

An issue of cognition. What are the signals of cognitive operations that can assist librarians in identifying the cognitive level of their students? In practice, assumptions are made concerning the cognitive development of a particular student. In keeping with Elkind, this is done primarily through observation of the student's "productions, his play, his art productions and the way he approaches his learning tasks (1981, p.9). My experience has been that these observation are used to intuitively classify a student as using either concrete or formal operations. The signals that are being interpreted as signs of cognitive development need description and validation. How do we know what we know? Are these judgments accurate?

Cognitive signals could be identified through observation. Their validity could be established through testing or interviewing the student. Finally, this information could be compared and contrasted with teacher perceptions.
Final Remarks

I believe that the fundamental goal of education should be teaching students to think and that it is the responsibility of all educators to create conditions that support, encourage, and insist upon student thinking. However, the opportunity for librarians to teach thinking is somewhat limited.

I have found dialogue to be the most personally satisfying method of teaching these skills. The process does not have to wait for approval from the educational super-structure. It can begin immediately. When that happens, each interview can become an opportunity for teaching and learning for both the interviewer and the student. It is up to us, the librarians, to make the reference connection.
SELECTED BIBLIOGRAPHY


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APPENDIX A
GUBBINS' MATRIX OF THINKING SKILLS

I. Problem Solving
   A. Identifying general problem
   B. Clarifying problem
   C. Formulating hypothesis
   D. Formulating appropriate questions
   E. Generating related ideas
   F. Formulating alternative solutions
   G. Choosing best solution
   H. Applying the solution
   I. Monitoring acceptance of the solution
   J. Drawing conclusions

II. Decision Making
   A. Stating desired goal/condition
   B. Stating obstacles to goal/condition
   C. Identifying alternatives
   D. Examining alternatives
   E. Ranking alternatives
   F. Choosing best alternative
   G. Evaluating actions

III. Inferences
   A. Inductive thinking skills
      1. Determining cause and effect
      2. Analyzing open-ended problems
      3. Reasoning by analogy
      4. Making inferences
      5. Determining relevant information
      6. Recognizing relationships
      7. Solving insight problems
   B. Deductive thinking skills
      1. Using logic
      2. Spotting contradictory statements
      3. Analyzing syllogisms
      4. Solving spatial problems
IV. Divergent Thinking Skills

A. Listing attributes of objects/situation
B. Generating multiple ideas (fluency)
C. Generating different ideas (flexibility)
D. Generating unique ideas (originality)
E. Generating detailed ideas (elaboration)
F. Synthesizing information

V. Evaluative Thinking Skills

A. Distinguishing between facts and opinions
B. Judging credibility of a source
C. Observing and judging observation reports
D. Identifying central issues and problems
E. Recognizing underlying assumptions
F. Detecting bias, stereotypes, cliches
G. Recognizing loaded language
H. Evaluating hypotheses
I. Classifying data
J. Predicting consequences
K. Demonstrating sequential synthesis of information
L. Planning alternative strategies
M. Recognizing inconsistencies in information
N. Identifying stated and unstated reasons
O. Comparing similarities and differences
P. Evaluating arguments

V. Philosophy and Reasoning

A. Using dialogical/dialectical approaches

Note: This matrix is based on a compilation and distillation of ideas from Bloom, Bransford, Bruner, Carpenter, Dewey, Ennis, Feuerstein, Jones, Kurfman and Solomon, Lipman, Orlandi, Parpes, Paul, Perkins, Renzulli, Sternberg, Tuchman, Taba, Torrance, Upton, the Ross Test, the Whimbey Analytical Skills Test, The Cornell Critical Thinking Test, The Cognitive Abilities Test, The Watson-Glaser Critical Thinking Appraisal, the New Jersey Test of Reasoning Skills and the SEA Test.

### APPENDIX B

**THINKING SKILLS USED IN THE LIBRARY RESEARCH PROCESS**

<table>
<thead>
<tr>
<th>THINKING SKILLS</th>
<th>STEPS IN THE RESEARCH PROCESS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Choose Topic</td>
</tr>
<tr>
<td><strong>Divergent</strong></td>
<td>X</td>
</tr>
<tr>
<td>List attributes</td>
<td></td>
</tr>
<tr>
<td>Generate multiple ideas</td>
<td>X</td>
</tr>
<tr>
<td>Generate unique ideas</td>
<td>X</td>
</tr>
<tr>
<td>Generate detail ideas</td>
<td>X</td>
</tr>
<tr>
<td>Synthesize information</td>
<td></td>
</tr>
</tbody>
</table>

| **Decision Making** | X | X | X | X |
| State desired goal | X | X | X | X |
| State obstacles to goal | X | X | X | X |
| Identify alternatives | X | X | X | X |
| Examine alternatives | X | X | X | X |
| Choose best alternative | X | X | X | X |

| **Evaluative** | X | X | X | X |
| Identify central issue | X | X | X | X |
| Judge credibility of source | X | X | X | X |

| **Problem Solving** | X | X | X | X |
| Identify general problem | X | X | X | X |
| Clarify problem | X | X | X | X |
| Formulate hypothesis | X | X | X | X |
| Formulate questions | X | X | X | X |
| Generate related ideas | X | X | X | X |
| Formulate solution | X | X | X | X |
| Choose best solution | X | X | X | X |
| Apply solution | X | X | X | X |
| Monitor solution | X | X | X | X |

**Note:** Thinking skills are drawn from Gubbins' Matrix of Thinking Skills.
APPENDIX C

STEPS IN LIBRARY RESEARCH

1. Choose a broad topic.
2. Get an overview of the topic.
3. Narrow the topic.
4. Develop a thesis.
5. Formulate questions.
6. Plan for research and production.
7. Find/analyze/evaluate sources.
8. Evaluate evidence/take notes/compile bibliography.
9. Establish conclusions/organize information into an outline.
10. Create and present final product.

APPENDIX D

VERB HIERARCHY

Level 1 - **Recalling (Fact-Finding Research)**
- arrange; cluster; define; find; identify; label; list;
- locate; match; name; recall; recount; repeat; reproduce;
- select; sort; state.

Level 2 - **Explaining (Asking/Searching Research)**
- apply; cite; complete; convert; demonstrate; describe;
- document; dramatize; emulate; estimate; expand; explain;
- expound; express; generalize; give example; illustrate;
- imagine; paraphrase; portray; prepare; present; produce;
- propose; restate; review; search; show; solve; speculate;
- summarize; support; survey; translate; use.

Level 3 - **Analyzing (Examining/Organizing Research)**
- analyze; apply arrange; associate; break down; categorize;
- change; characterize; classify; compare; compile;
- construct; contrast; correlate; diagram; differentiate;
- discover; discriminate; dissect; distinguish; divide; examine;
- experiment; extend; group; infer; interpret; manipulate;
- map; modify; organize; outline; plan; question; relate;
- revise; rewrite; scrutinize; select; separate; sequence;
- sift; simplify; solve; transplant; uncover; utilize; verify

Level 4 - **Challenging (Evaluating/Deliberating Research)**
- appraise; argue; assess; compare; criticize; debate;
- defend; determine; discriminate; evaluate;
- grade; investigate; judge; justify; modify; prioritize; rank;
- rate; refute; review; support; value; weigh.

Level 5 - **Transforming (Integrating/Concluding Research)**
- blend; build; combine; compile; compose; conclude;
- construct; convince; create; decide; design; develop;
- forecast; formulate; generate; imagine; modify; persuade;
- plan; predict; produce; propose; revise; speculate; structure.

Level 6 - **Synthesizing (Conceptualizing Research)**
- build a model program; create; design; develop; devise;
- generate; hypothesize; invent; propose; theorize.