The Value of LIS Schools' Research Topics to Library Authors' Professional Work

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Available online 15 October 2008

Stoan's distinction between library skills and research skills based on different philosophies of information seeking suggests the value of training in research methodology for the librarian. Such training could lead to more effective patron consultations, committee/administrative work, and personal research. Thus, a convenience sample of web-based syllabi for web-assisted research courses at 25/57 of the American Library Association-accredited programs were subjected to exploratory analysis, and 45 syllabi-based research topics were reviewed for usefulness to library authors' professional work.

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Introduction

Many librarians who are extremely adept with bibliographic library skills of accessing information on a given subject(s) shudder at the thought of learning and utilizing research skills of expanding knowledge through hypothesis testing and quantitative methodology. Indeed, authors such as Dilevko[1] have cited library and information science and education students' anxiety associated with courses in research methods and statistics. However, in 1984 Stoan's[2] distinction between library skills and research skills based on different philosophies of information seeking suggests the value of specific coursework/training in research methodology for the librarian. Training in research skills could lead to more effective consultations with the patron researcher, library committee/administrative work, and personal research for promotion and tenure.

This paper addresses what research topics are in syllabi for web-assisted research methodology courses from ALA-accredited programs. Also it presents how useful do library authors perceive research methodology courses to three major work areas: consultation, committee/administrative work, and personal research. The paper studies how useful do library authors perceive each of several research topics to their professional work. Finally, the paper covers what is the relationship between the frequency of research topics on research course syllabi and perceived usefulness of the topics to professional work.

Thus, a convenience sample of web-based syllabi for web-assisted research courses at 43.9% (25/57) of the American Library Association-accredited school programs has undergone an exploratory analysis, suggesting 45 research methodology topics. Then the study reviews how coursework/training in each of these 45 research topics may aid library journal authors' professional work.

There is limited literature on the efficacy of teaching of research methods courses in library and information science programs Staples[3] surveyed 230 Brigham Young University library school graduates to determine the usefulness of library school research courses. About half of the respondents liked "gaining a general understanding of research and its tools." Although most respondents did not undertake formal research, they did use research skills in obtaining data for problem-solving at least once. Some respondents suggested needing more time to complete library school research projects and wanted research courses requiring a shorter, publishable article, as well as more comprehensive statistics instruction. In 1990, Stephenson[4] surveyed instructors of the basic research methods courses in 52 ALA-accredited library school programs. All

instructors required evaluation of a research article. Most courses provided basic research methodologies and computer-based statistical analyses, but less than 50% of the instructors required the teaching of statistics beyond basic skills and the implementation of research projects. It was suggested that the programs were possibly not conveying enthusiasm or commitment to research. In 1992, Smith and Adams[5] expanded Stephenson's study to include a survey of all 76 research methods and statistics courses taught at 52 ALA-accredited programs. Similarly to Stephenson's results, 98% of the courses required evaluation of a research article. Most instructors' courses provided statistical topics, but only 36% listed follow-up or advanced statistical courses. Fifty-six percent of the courses required practical research experience. Several instructors wanted more time to teach present topics. Finally, Etches-Johnson[6] emphasized the importance of library school research and writing experience for later publishing — weblogs, newsletters, short articles, book reviews, volunteer bibliographic work, and non-library publications.

Many studies have suggested the importance of librarians utilizing research skills in their daily reference consultations, instruction, and other work. Fister[7] in 1992 recommended that librarians may need research skills to consult with students to help them quickly review a topic within a given discipline, find a gap in the topic's knowledge, develop a potential research idea, gather information, and write. Fister,[8] further, in 1993 emphasized placing bibliographic information in a rhetorical framework, which could be used to construct text which fits within a scholarly communication network. Bodi[9] in 2002 emphasized the importance of librarians' asking questions to teach both the skills of flexible research strategies in different disciplines and a growing body of online searching. Authors who have cited the teaching of library "research" courses — Wood (1984),[10] LaGuardia, Martorana, and Melenndez (1993),[11] and List (1995),[12] often have focused on the literature and research review. However, the consummate researcher must realize that these latter authors have still emphasized only part of the research process — the literature and research review rather than placing the consultation or course within the entire research framework.

What then does the entire research framework include? Perhaps Kuhn's concept of paradigm could provide the background knowledge for a given discipline. Although Martin[13] has pointed out that a field may have no "coherent structure having a shared intellectual paradigm," Kuhn (1996)[14] has used the term "paradigm" as either "the entire constellation of beliefs, values, techniques, and so on shared by the members of a given (scientific) community" or "one sort of element in that constellation, the concrete puzzle solutions which, employed as models or examples, can replace explicit rules as a basis for the solution of the remaining puzzles of normal science." Thus, the librarian's first research skill in daily consultation or instruction might be familiarity with a given discipline's paradigm.

Later steps in the research process which often include testing hypotheses through data collection can relate to the structure of scientific papers. During 1998, Suppe,[15] Lipton,[16] Franklin and Howson,[17] and Suppe[18] wrote papers on Suppe's definition of the structure of a natural or social scientific paper which reported data to establish hypotheses — abstract, introduction, theoretical background, experimental or observational techniques, samples, data analysis, results or observations, discussion, summary/conclusions, acknowledgments, references, and appendices. In 2002 Cleland[19] suggested that historical, non-experimental scientists evaluated alternate hypotheses about past events by looking at current traces to find the best currently available explanation. Thus, the librarian, in a given discipline, must be familiar with the appropriate experimental, historical, or other research process and steps to help or at least understand how the literature review fits into the entire research scholarly process.

The librarian who has learned research skills such as research design and quantitative and qualitative methodology can do more effective committee work and personal research for promotion and tenure. Many committees have needed simple spreadsheets or surveys with descriptive statistics to evaluate existing or new library services.

Finally, there is an additional advantage of familiarity with the research process. It teaches the hypothetico-deductive process and logical thinking. For example, Zandonade (2004),[20] cites Jesse Shera, a Ph.D. graduate of the research-oriented University of Chicago Library School and his development of an epistemological basis for library science which drew on theory and ideas from bibliography, librarianship, and documentation.

As suggested in 2001 by Hernon,[21] professional research in the library and information science area can improve with examination of new issues and raising the bar which defines "good" research as an inquiry process.

Methodology

To explore the research topics in syllabi for web-assisted research methodology courses from ALA-accredited programs, Perkins and Helbig used methodology similar to that of Hrycaj.[22] In 2006 Hrycaj used the Google search engine and various descriptors to define a database of 100 online syllabi for college introductory library skills courses, including some library research courses. However, he analyzed these syllabi according to ACRL "Information Literacy Competency Standards for Higher Education."

With somewhat related methodology, in the Fall 2005 semester, Perkins gathered the data for the present study obtained from a convenience sample taken from the 57 United States/Canadian university websites, all of which had LIS schools with American Library Association-accredited master's programs. Each of twenty-five of these LIS schools had a website with at least one syllabus for a web-assisted course in statistics/research methodology. Available research course syllabi were obtained from websites in the Fall 2004, Spring 2005, and Summer 2005 semesters. These 25 schools were considered a representative sample of the 57 LIS schools. The sample covered 20 states and 4 provinces, as compared with the population which covered 33 states and five provinces. Fifteen out of 25 of the sample had Ph.D. programs, and 33 out of 57 of the population had Ph.D. programs. The research course was a required course for the master's degree in twenty of the 25 LIS schools. Although an e-mail letter which requested course syllabi was sent to the research methodology instructors in the remaining 32 LIS schools, there were no syllabi or other responses sent to the author. The author felt that many such unexpected e-mails were considered spam, and did not try further to use e-mails to gather data.

In the Spring 2006 semester, an exploratory analysis of the web-based syllabi for web-assisted research methodology courses at each of the 25 ALA-accredited LIS school programs

was then done. The author reviewed all LIS school, master's level course syllabi which had "research" in the course title and related to statistics, quantitative research methodology, and/or qualitative research methodology; read each syllabus and listed themes of research methodology from course descriptions, objectives, purpose, goals, requirements, organization, content, topics, outlines, schedules, readings, assignments, research projects/presentations etc. Although some of the themes or research topics were more general than or overlapped in content with other research topics, themes were used as they were described in the syllabus; it was not possible to determine whether the course instructor who listed a general topic of research methodology in the syllabus taught more specific areas subsumed under that topic. Additionally, instructors sometimes clustered areas of research methodology, which contributed to the differences in granularity difficulty. After a preliminary exploratory analysis for five of the LIS schools was performed, coding sheets were made with names of obtained individual themes of research methodology instruction or "research topics" on the vertical axis and names of LIS schools across the horizontal axis. As the research course syllabi for the remaining twenty schools were analyzed, the names of other research topics were added to the coding sheet. After the exploratory analysis for the 25 schools' syllabi was finished, 45 individual themes of research methodology instruction or "topics of research methodology" were obtained.

Use of a sample of published library authors and survey methodology allowed study of library authors' perceived usefulness of research methodology courses to three major work areas: consultation, committee/administrative work, and personal research. Also studied were authors' perceptions of how 45 research methodology topics analyzed from the LIS school syllabi aided their professional work. In the Fall 2006 and early Spring 2007 semesters, an original sample of 748 authors was randomly selected from authors who had published in one or more of six, well-known library and information science journals, as defined by the Head, Western Kentucky University Department of Library Public Services and author This was an attempt to sample individuals in library or library-related professions who were familiar with research. Authors were selected from the July/Summer, 2001–June/Spring, 2006 issues. There were 124 authors from *College & Research Libraries;* 124, from *Journal of Academic Librarianship;* 124, from *Library Resources and Technical Services;* 110, from *Libraries and Culture;* 141, from *Library Journal;* and 125, from *Reference and User Services Quarterly.* Due to repeat authors who had published more than one article and appeared more than one time in the original sample, the final sample included 633 United States individuals and 49 individuals from countries outside the United States. The large sample was chosen to allow for moderate response rates of return of the survey instrument. When possible, an individual author's address was obtained from the given journal, updated by the *ALA Handbook of Organization 2006–2007*. Many institutional addresses had to be obtained from the *2006–2007American Library Directory* or occasionally from Google searches.

The library authors' response data were obtained from a print instrument shown in Appendix 1A. The instrument included Part I: Demographic Information with principal area of work, gender, indication of statistics/research methodology courses/training sessions taken, the number of years worked in a library or other library-related profession, and relationship between promotion and publication. Part II: Usefulness of Research Courses to Work Areas comprised a Likert rating scale for usefulness of research courses to each of three work areas of patron/client/student consultation, library/other committee/administrative, and personal research. Part III: Usefulness of Research Areas to Professional Work included a Likert rating scale for each of 45 research areas' usefulness to professional work. Finally, there was an Additional Comments section which completed the two-page format of the instrument.

In the Summer 2007 semester, Western Kentucky University Institutional Research prepared and printed the letters sent to individual authors, surveys, and return envelopes; stuffed and sealed the mailings; and prepared reminder postcards. Then in October, 2007, each library/related profession author was mailed an introductory letter, with a reference to the library author's published article, as shown in Appendix 1B; the print instrument; and a return, postage-paid envelope. Two weeks later, reminder post cards were mailed to the library authors.

Two hundred eighty-eight of the 682 library authors surveyed responded, for a response return rate of 42.23%. The excellent response return rate was attributed to Cobb's idea[23] of sending each library author an introductory letter which stated that he/she was selected for the survey because of his/her article which was referenced in the letter. Thirty unopened survey envelopes were returned to sender, mostly with addresses unknown.

Results

The research topics in syllabi for web-assisted research methodology courses from ALA-accredited programs were reviewed. Overall results for the 25 LIS schools indicated that on the average, a given research topic ($N=45$) appeared in 11.2 LIS schools, and on the average, a given LIS School's syllabus/syllabi ($N=25$) had 21.08 research topics.

The frequency of appearance in the courses in the 25 LIS schools was then tabulated and ranked for each research topic item. Table 1 lists the top 20% of the ranked frequencies of research topics in courses' syllabi from the 25 ALA-accredited school programs. It is interesting to note that each of at least 24 LIS schools included quantitative research methods/data analysis, critical evaluation of literature, and written research plans/papers on its syllabi. Thus, most instructors emphasized utilization of those topics important to research review and writing. Table 2 lists the bottom 20% of the ranked frequencies of research topics in courses' syllabi from the 25 ALA-accredited school programs. Applications such as action research, writing grant proposals, assistance of clients, and global applications to different countries appeared in only two or less schools. It is curious to note that the topic of writing grant proposals did not appear more frequently, along with the written research plan. However, the other topics seem of marginally related content at best. Appendix 2A, Ranked Frequencies of Syllabi Research Topics, lists the ranked frequency data from all 45 research topics.

It should be noted that unevenness or different levels of granularity between statistics/research methodology topics was unavoidable, due to the limitations of data that were available on the syllabi. This included limitations of topics clustered together and/or subsumed under a general topic.

In the Spring 2008 semester, data analysis of the survey instruments was started to review library authors' perceptions of the 45 research topics' usefulness to their professional work.

Table 1
Top 20% of Ranked Frequencies of Syllabi Research Topics

Research Topic	Frequency of Appearance in Schools
Quantitative Research Methods/Data Analysis	25
Critical Evaluation of Literature	25
Written Research Paper/Plan	24
Hypothesis Testing/Research Questions	22
Qualitative Research Methods/Data Analysis	21
Application of Other Research to Library Discipline	21
Language/Operational Definitions of Research/Conceptualization	20
Experimental Research Design	20
Survey Research/Focus Group	20

Table 3 gives the characteristics of the library author sample which had over 280 respondents. Sixty-eight and six-hundredths per cent worked as academic/research librarians; 12.15%, as LIS school faculty members; and 5.21%, as public librarians. Fewer respondents were editors/writers, special librarians, vendors, student, retired or not currently employed, or from varied other professions. Sixty-three and sixty-four hundredths per cent of the library author respondents were females. These demographics represented a sample somewhat different from that of a 2006 ACRL membership survey sample of academic librarians. The ACRL sample had over 3000 respondents with 88% employed in an academic setting and 2% employed in an LIS graduate school. Seventy-five percent of the ACRL sample were females.

As indicated in Table 4, the mean number of years that library author respondents had worked in a library or other library-related profession was 21.14 years. Seventy and twenty-eight hundredths per cent of the library author respondents' advancement and promotion was linked to publication. Fifty-seven and twenty-nine hundredths of the library author respondents had taken at least one statistics/research methodology course at an LIS school.

Table 5 gives the library/related profession author respondents' perceived usefulness of overall research methodology courses for three work areas. Usefulness of research methodology courses was measured on a 1(low) – 7(high) rating scale. Library author respondents perceived research methodology courses as useful for all three work areas. The mean for course usefulness for patron/client/student consultation/reference work was 3.99, mean usefulness for library/other committee/administrative work was 4.20, and mean usefulness for personal research was 5.42. It should be noted that the means had rather large standard deviations which minimized accurate interpretation of mean differences.

Each research topic's mean usefulness to library authors' work was then ranked. Usefulness of research areas was measured on a 1(low) – 7(high) rating scale. Table 6 lists the top

Table 2
Bottom 20% of Ranked Frequencies of Syllabi Research Topics

Research Topic	Frequency of Appearance in Schools
Quasi/Experimental Design	5
Normal Distribution/Estimation	4
Multivariate Analysis (Multiple Regression, Factor Analysis)	4
Human Subjects Committee Review	4
Citation Analysis	4
Action Research	2
Written Grant Proposal	2
Assistance of Clients	2
Global Applications	2

Table 3
Library Authors' Sample Characteristics

Principal area of work	Academic/Research librarian	$N=196$	68.06%
	Editor/Writer	$N=5$	1.74%
	Library/Information Sciences school faculty	$N=35$	12.15%
	Public librarian	$N=15$	5.21%
	Special librarian	$N=4$	1.39%
	Student	$N=1$	0.35%
	Vendor	$N=4$	1.39%
	Retired/Not Currently employed	$N=4$	1.39%
	Other	$N=24$	8.32%
	Total	$N=288$	100.00%
Gender	Female	$N=182$	63.64%
	Male	$N=104$	36.36%
	Total	$N=286$	100.00%

Table 4
Library authors' sample characteristics

Number of years worked in library or other library-related profession	0	$N=5$	1.77%
	1–10	$N=57$	20.14%
	11–20	$N=81$	28.62%
	21–30	$N=78$	27.56%
	31–40	$N=57$	20.14%
	>40	$N=5$	1.77%
	Total	$N=283$	100.00%
Advancement/Promotion linked to publication	Yes	$N=201$	70.28%
	No	$N=85$	29.72%
	Total	$N=286$	100.00%

Note. Number of Years Worked In Library: $X=21.14$, S.D.$=11.16$, $N=283$.

Table 5
Library Authors' Perceived Usefulness of Research Methodology Courses for Work Areas

Work Area	Courses' Usefulness to Professional Work		
	Mean	S.D.	*N*
Patron/Client/Student Consultation/Reference work	3.99	2.00	214
Library/Other Committee/Administrative work	4.20	1.92	242
Personal research	5.42	1.77	253

Note. The rating scale for these items were 1 (low) – 7 (high).

20% of the research topics ranked by mean usefulness to library authors' work. It is interesting to note that the top four research topics' mean usefulness rankings included critical evaluation of literature, written research plan, scholarly publication process, and interpretation of research results/discussion. Similarly to the top ranked frequencies of syllabi research topics, library author respondents emphasized topics important to research review and writing. In fact, four of the top 20% research topics ranked by frequency on the research course syllabi and by mean usefulness to professional work on the survey were identical. It should be noted that many of these topics' means had rather large standard deviations which minimized accurate interpretations of mean differences.

Table 7 lists the bottom 20% of the research topics ranked by mean usefulness to library authors' work. Usefulness of research topics was measured on a 1 (low) – 7 (high) rating scale. It is interesting to note that five of the bottom 20% research topics ranked by mean usefulness to professional work and by frequency on the research course syllabi were identical. Library authors minimized the usefulness of these more sophisticated statistics/measurement topics such as multivariate analysis, quasi-experimental design, and normal distributions, as well as marginally related research topics such as global applications and action research. It should be noted that many of these topics' means had rather large standard deviations which minimized accurate interpretations of mean differences. Appendix 2B, Research Topics' Ranked Mean Usefulness to Authors' Work, lists the data for ranked mean data from all 45 topics.

Table 6
Top 20% of Topics' Ranked Mean Usefulness to Authors' Work

Research Topic	Usefulness to Professional Work		
	Mean	S.D.	*N*
Critical Evaluation of Literature	5.96	1.29	267
Written Research Plan	5.87	1.34	264
Scholarly Publication Process	5.84	1.57	265
Interpretation of Research Results/Discussion	5.75	1.50	264
Data Collection	5.59	1.48	259
Qualitative Research Methods/Data Analysis	5.32	1.65	257
Oral Presentations of Research	5.22	1.75	259
Application of Other Research to Library Discipline	5.11	1.85	235
Test/Questionnaires	5.04	1.92	256

Note. The rating scale for these items was 1(low) – 7 (high).

Table 7
Bottom 20% of Topics' Ranked Mean Usefulness to Authors' Work

Research Topic	Usefulness to Professional Work		
	Mean	S.D.	*N*
Unobtrusive Research Measures	3.82	2.04	207
Normal Distributions/Estimation	3.79	1.95	204
Action Research	3.66	2.06	134
Experimental Research Design	3.66	1.96	227
Correlation/Linear Regression	3.62	2.08	201
Bibliometrics	3.59	1.99	197
Multivariate Analysis (Multiple Regression, Factor Analysis)	3.42	2.03	202
Global Applications	3.38	2.01	122
Quasi/Experimental Design	3.29	1.89	182

Note. The rating scale for these items was 1(low) – 7 (high).

Finally, the Spearman Rank Correlation Coefficient was 0.58 between the 45 research topics ranked by frequency on the research course syllabi and by mean usefulness to professional work on the survey; the coefficient is significant at $p<0.0001$. Many of the author practitioners' perceptions of research topics useful to their work confirmed what the LIS schools offered.

Additional analyses or comparisons of respondents' years of experience by each of means of 45 research topics; respondents' areas of work by occurrence of promotion link to publication; and mean usefulness of research courses by means of each of 45 research topics produced negligible results.

Finally, the comments at the end of the survey instrument were reviewed. It is interesting to note that only 12/73 of the comments indicate respondents who had little or no statistical research methodology training.

Discussion

The current paper has attempted to follow up on Stoan's distinction[24] between library skills and research skills. The paper has emphasized the most frequently taught research skills at LIS schools and library author practitioners' perceptions of these topics' usefulness to work. As such, the paper's authors have emphasized a comprehensive field of discrete research skills, rather than the overall research areas mentioned in the literature. The entire research process was discussed, rather than only the literature review. Finally, the sample of library author practitioner's perceptions of topics important to work was utilized, somewhat similarly to Staples' sample[25] of library school graduates' perceptions of the usefulness of library school research courses. The latter sample reported using research skills in obtaining data for problem-solving at least once.

The ranked frequencies of research topics in the syllabi for research courses from ALA-accredited programs provided a

preliminary review of the programs' coursework/training in research methodology. This may be of interest to the research course instructors who design the research coursework at these schools. Also such coursework provides more of an entire research framework, rather than only literature review skills which are commonly used by librarians. This research methodology coursework would suggest a basis for an entire framework which could be applied to the work of library-related professionals who utilize research.

In an attempt to sample individuals in libraries or library-related professions who were familiar with research, a sample of library journal authors was used. Responses to the survey instrument included a large percentage of academic/research librarian respondents and a sizeable percentage of LIS school faculty member respondents. At least 57% of the entire set of respondents had taken at least one statistics/research methodology course at an LIS school. The authors suggested that at least some of these research topics could be helpful in client/patron/student consultation, in library/other committee/administrative work, and/or in personal research.

Consultation/reference work with the client/patron/student may include the research scholar, whether professional or student. Generally, the scholar is or becomes familiar with his/her discipline-specific paradigms and school of thought. Then, as adapted from Stoan,[26] the research inquiry process of hypothesis testing or otherwise answering research questions; design; literature review; empirical methodology; results, discussion, and conclusion expands the quest for knowledge. Familiarity with the research topics specific to the disciplines of the client/patron/student may improve communication with the scholar and ability to access information related to any part of the research process. Additionally, LIS schools' faculty members who offer courses in science librarianship, social science librarianship, and/or humanities librarianship may want to include discipline-specific research methodology topics in their coursework. Thus, students could readily see these skills' application to future library work.

Work with library surveys or with committees that requires statistical reports often requires familiarity with many statistics/research methodology topics. For minimal presentation of numerical data, the research topics of descriptive statistics, along with statistics software/spreadsheets are useful.

Work toward promotion and tenure at a college or university may require publishing articles in professional journals. Thus, research topics learned in LIS schools' research courses apply directly to these responsibilities. Indeed, the research topic of doing a written research paper was emphasized in web-based research methodology course syllabi for 24 of the 25 schools.

It is interesting to note that on the average, library author respondents emphasized the research topics important to research review and writing. Less useful research topics were perceived to be the more sophisticated statistics/measurement topics and marginally related research topics.

The ranked frequencies of research topics in the web-based syllabi for web-assisted research methodology courses from ALA-accredited LIS schools' programs were similar to the library authors' ranked usefulness of research topics to professional work. Several of the top and bottom ranked research topics on both syllabi and surveys were identical. LIS schools seem to be teaching many of the research methodology areas that library authors rank as useful to professional work. Future thought might be given to a comparison of LIS school instructors' and library practitioners' perceptions of research topics useful to professional work.

In summary, many of the library author practitioners' perceptions of useful research topics highlighted what LIS schools taught.

Conclusion

In conclusion, the paper confirms the perceived value of research methodology topics for a sample of library authors' professional work. The study is limited to a sample of authors in six library journals; this sample was chosen to include individuals familiar with research terms/topics, and thus leans heavily toward academic librarians and faculty. It suggests that similar research methodology topics taught at American Library Association-accredited school programs are perceived as important to the programs and to a limited sample of published library authors. Further, there is some correspondence between the ranked frequencies of research topics taught at American Library Association-accredited school programs and the ranked mean usefulness of research topics to professional library authors' work. Training in statistics/research methodology for the librarian author may be related to effective patron consultation, committee/administrative work, and personal research.

"[This] paper confirms the perceived value of research methodology topics for a sample of library authors' professional work."

Thus, it is easy to see how research course instructors from ALA-accredited library school programs, in designing their courses, could be interested in this exploratory analysis of research course topics. As a secondary issue, the paper points out the rather large research framework taught in the sample of LIS schools. Such a framework points to the potential helpfulness of the relationship between the use of at least some research topics and more effective consultations with the client/patron/student/researcher; library/other committee/administrative work; and personal research for promotion and tenure. Further, the process of scientific inquiry and the research process teaches an example of the hypothetico-deductive process of logical thinking. The crux of the matter is verifying and showing the student how knowledge of the research topics will apply to his/her thought process, as well as to his/her forthcoming professional daily work, and how these research skills are different from traditional library bibliographic skills.

Acknowledgments: The authors thank Bob Cobb, Director, Institutional Research, Western Kentucky University, for consultation on the research design and survey instrument; overseeing the data preparation, printing, mailing, and data analysis. Thanks to Ashley Jackson and Meagan R. Miles, Student Assistants, Department of Library Public Services, WKU, for their accurate and tireless help in data collection, data preparation, and word processing for the manuscript. Thanks to Ken Foushee, Department of Library Public Services, WKU, for additional word processing. Also thanks to Mary Jane Petrowski, Associate Director, Association of College &

Research Libraries, American Library Association, for discussions of methodology and instrument; and to Maribeth Chapman, ALA, who discussed librarian samples. Thanks also go to Drs. Brian Coutts, Head, Department of Library Public Services, WKU, Charles H. Smith, Professor, Department of Library Public Services, WKU, and John R. Bruni, Associate Professor, Department of Psychology, WKU for their reading of and consultation on the paper at various stages.

In support of this research project, the WKU Office of Sponsored Programs granted a $2000 Faculty Scholarship Council Award.

Appendix A. Supplementary Data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.acalib.2008.09.002.

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