

Knowledge Bases and Library Education

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A continuing topic of debate among research library administrators and library educators is whether graduate library education adequately prepares librarians for the research library environment. Unfortunately, there has been little research to identify specific knowledge needs of academic research librarians or how these needs change over the librarian's career. There also has been insufficient attention paid to what training library administrators must provide to supplement the graduate program as the librarian moves through a career that will span many years and countless changes. Therefore, randomly sampled ARL librarians were asked to rate fifty-six knowledge bases according to how important they were and the degree to which they possessed each knowledge.



While there is no shortage of views and opinions in the profession regarding what is lacking in the educational preparation of librarians for research libraries, there is little research on which to base judgments about what knowledge and skills are required. Nor has adequate research been conducted to assess the specific knowledge and skills needed by librarians as they progress through their careers assuming new and different responsibilities.

What are the "baseline" skills and knowledge that each and every academic research librarian will be required to exercise throughout a twenty- or thirty-year career? To what extent will these requirements change depending on the positions that the librarian holds and in what organizational unit or division he or she functions?

Are the complaints about the educational preparation for research librarians focusing on the recent graduates, or are frustrated administrators also including li-

brarians who may be five, ten, or even twenty years away from formal classroom instruction? Is there agreement on whether the graduate library science program should be theoretical or practical in its focus?

There is no question that the educational preparation process is and should be a critical concern for library administrators, but so should the need to provide ongoing education and training because the environment within which librarians perform will change at an accelerated rate in the next decade. Millicent Abell notes that to "stay in the same place is to lose ground in a changing world."¹ This suggests that library educators and administrators should work together to reassess the content of library education and to strengthen library staff development programs in order to help librarians acquire new knowledge and skills throughout their careers.

What knowledge and skills have been identified as "baseline"? Abell indicates that research librarians urgently need skills for "intelligently analyzing our envi-

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ronment; for conducting research, including the manipulation of numerical data; for interpreting various clientele needs; for applying new technology; and for interacting effectively with other members of the team that provides academic library service." She goes on to say that librarians also need to be able to demonstrate an "appreciation of the sociology, politics and economics of higher education" and that "a librarian's needs for continual updating are intense."²

Toni Carbo Bearman suggests that librarians will need to "harness technology and management tools" and thus be prepared to conduct strategic planning, budget analysis and to learn how to use the various tools effectively and efficiently.³ Bearman also addresses the new needs implied by the changing role of the professional that will require a new look at library education and increased attention to continuing education for practitioners and library educators.

Patricia Battin believes that research libraries need people "who have been trained to question assumptions, collect data, resolve conflicts, make informed judgments, and take decisive actions. . . . We will need people who can speak and write well—and with precision—and who can interact effectively with a broad range of scholarly experts."⁴

There is little research on the knowledge and skills needed by academic librarians. In 1979 Sheila Creth and Faith Harders surveyed personnel administrators in thirty research libraries to identify requirements for beginning librarians. They concluded that librarians in research libraries will need to strengthen their knowledge of management and automation and their skills in research and writing.⁵ In 1980 the Association of Research Libraries surveyed library directors to ascertain the educational needs of entry-level librarians.⁶ The directors were also asked to predict competencies that would be needed in the next five years. The questionnaire provided for three sets of skills in the following categories:

Knowledge/skills considered traditional
General bibliography

General reference materials
Specialized reference materials
Theories of organizing information
Library automation
Collection development theories and practices
Library history
Library issues
People skills/managerial skills
Human relations
Supervisory skills
Managerial skills
Analytical skills
Nontraditional knowledge/skills
Research skills
Foreign language
In-depth knowledge of academic subject
Statistical skills
System analysis
Computer programming
Online retrieval skills

The survey found that traditional knowledge and skills, with the exception of library history and library issues, were either required or highly desirable. The managerial skills were "seen to be either required (human relations and analytical skills) or highly desirable (supervisory and managerial skills). One-third to one-half of the responses indicated that supervisory skills and managerial skills are not needed by entry-level librarians." Of the knowledge/skills identified as nontraditional, the directors identified these as "highly desirable, except that an equal number . . . considered systems analysis and programming skills as specialist skills or not important at the entry level. Statistical skills were seen to be highly desirable by more than half of the respondents as well as not as important at the entry level by one-third of the respondents."⁷ The survey did not uncover any major shift between desirable or required knowledge/skills for the entry-level librarian and what the directors predicted would be needed after five years.

Because the issue of preparation for research librarians is a critical one, more specific data are required on knowledge and skills needed at particular points in a li-

brarian's career according to the type of position. It will then be necessary to assess how best to deliver this education or training throughout the professional's career.

DESIGN OF THE STUDY

The basic objective of this study was to gather data that would provide answers to the following questions:

1. To what extent do university librarians consider themselves knowledgeable in relevant areas?
2. To what extent are these areas of knowledge considered important for effective job performance?
3. Where do university librarians tend to acquire their relevant knowledge?
4. Where do university librarians think such knowledge is best acquired?

This paper provides a summary of the analysis to date on the first two questions. In addition to answering these questions, the researchers were interested in exploring the possible relationships between the level of importance for certain areas of knowledge and the university librarians' years of experience and current position.

For purposes of this study, librarians were defined as individuals who were employed in ARL university libraries, who held a master's degree in library science, and who had nine years or less of professional-level experience. Librarians with ten or more years of experience were excluded from the study because of a concern that the education of those with relatively long tenure would differ significantly from the education of newer librarians. Also, the more experienced librarians would probably have more difficulty in recalling information about their M.L.S. education.

The population for the study consisted of 2,460 ARL librarians with nine or less years of professional experience. In order to generate a sample, twenty libraries were systematically selected, using a random start, from a list of all ninety-two ARL academic libraries. The list was stratified by geographical area and rank—ordered by relevant staff size within each stratum. This procedure resulted in a sample of 539

librarians representing 22 percent of the total population.

A mail questionnaire was designed to gather the information needed to answer the research questions. The first section of the questionnaire consisted of twelve questions requesting information about present position, professional and preprofessional work experience, education, age, sex, and the respondents' assessment of their educational activities.

The second part was in a matrix format, and the participants were asked to provide information about fifty-six different knowledge bases drawn from a review of checklists used in related research, including the ARL survey, the survey conducted by Creth and Harders, and the King Research project,⁸ and from selected library school course syllabi. It was anticipated that it would not be an easy task for participants to react to fifty-six knowledge bases, but it was concluded that this level of specificity was needed to generate meaningful, useful results. For each knowledge base, the participants were asked to indicate how much of the knowledge they possessed, where they had acquired it, how important they considered it to be for their own effective job performance, and where they thought the knowledge would best be acquired.

Following a pretest, copies of the questionnaire were mailed to the personnel administrators of the twenty sample libraries for distribution to the appropriate librarians. During this process, it was learned that the population consisted of no more than 508 librarians. Three hundred and forty-nine usable questionnaires, representing at least 69 percent of the population, were eventually returned.

FINDINGS

Profile of Respondents

Of the 323 respondents answering the question about current position, 161 (49.8 percent) indicated they held nonadministrative positions, 122 (37.8 percent) were "department heads," and 11 (3.4 percent), assistant department heads. There were 6 assistant directors (1.9 percent) and 1 director (0.3 percent). Twenty-two respondents indicated they held positions

categorized as "other," including library systems analyst and curator of archives. One hundred and five respondents (32.4 percent) indicated they currently work in public services units, 110 (34 percent) in technical services, 6 (1.9 percent) in administrative services, 9 (2.8 percent) in systems, 66 (20.4 percent) in divisional libraries, and 28 (8.6 percent) in "other" units.

Approximately 70 percent of the respondents had preprofessional library experience ranging from 1 to 17 years; and the mean number of years was 4.37; years of professional experience ranged from less than 1 to 9, with a mean of 4.73.

Other than the bachelor's degree and the master's in library science, the subject master's was the only other degree held by a significant percentage (35 percent) of the respondents. Of the subject master's degrees, 53 percent were in the humanities, 43 percent in the social sciences, and 3 percent in the pure sciences.

Sixty-nine percent of the respondents were female, and 31 percent were male; their ages ranged from 23 to 63 with a mean age of 35.5 years.

Respondents were asked to evaluate their formal library education, as well as their postgraduate training and education for professional assignments, using a scale of 1 to 4 where: 1 = strongly agree, 2 = agree, 3 = disagree, and 4 = strongly disagree. The four education-related statements and the mean responses were as follows:

1. In general my library science master's program was more theoretical than practical (mean response = 2.15).

2. My formal library education was effective in preparing me for my current position (mean response = 2.41).

3. My on-the-job training and staff development have been effective in prepar-

ing me for my current position (mean response = 1.59).

4. My continuing education activities have been effective in preparing me for my new position (mean = 1.89).

Responses to the first question indicate the respondents' tendency to agree that their formal master's program was more theoretical than practical. A comparison of the next three questions suggests that participants considered their on-the-job training to be the most effective, continuing education the next most effective, and formal library education the least effective preparation for their *current* positions. It should be kept in mind, however, that the respondents were asked to evaluate education and post-M.L.S. training and education in relation to their current positions only, not to initial or previous positions. It is possible that questions about other positions held during the nine-year period under study would have elicited different response patterns.

It was thought that there might be a relationship between perceptions of how theoretical formal library education was and perceptions of how effective it was. This was the case, as the two variables were found to be significantly related at the .05 level ($X^2 = 17.25$, Cramer's $V = .13$).^{*} As can be seen in table 1, and as the relatively low Cramer's V indicates, this was not a particularly strong relationship.

For example, 8.8 percent of those who "strongly agreed" and 4.5 percent of those who "agreed" that their library education was more theoretical than practical strongly agreed that their education was effective, but 14.1 percent of those who "disagreed" and 6.7 percent of those who "strongly disagreed" that their education was more theoretical also strongly agreed that their education was effective. In other words, respondents tended to

*Chi-square values (X^2) were calculated to identify statistically significant bivariate relationships; Cramer's V 's were determined in order to indicate the strength of the relationships. Chi-square analysis was deemed appropriate because the data represented a mixture of ordinal and categorical scales. Computer statistical packages routinely generate Cramer's V 's along with chi-square values. Cramer's V can be interpreted much like a correlation coefficient: it can range from zero to plus one, and the higher the value the higher the degree of association. Cramer's V does not indicate the manner or direction in which the variables are associated, however. In this paper V 's are reported for those bivariate relationships considered to be statistically significant as determined by the chi-square analysis.

TABLE 1
EFFECTIVENESS OF FORMAL LIBRARY EDUCATION

More Theoretical Than Practical	Effectiveness				Total
	Strongly Agree	Agree	Disagree	Strongly Disagree	
Strongly Agree	6 8.8%	29 42.6%	22 32.4%	11 16.2%	68 100%
Agree	7 4.5%	81 52.3%	56 36.1%	11 7.1%	155 100%
Disagree	12 14.1%	49 57.6%	17 20.0%	7 8.2%	85 100%
Strongly Disagree	1 6.7%	8 53.3%	5 33.3%	1 6.7%	15 100%
Totals	26	167	100	30	323
Row %	8%	51.7%	31.0%	9.3%	100%

view their graduate library education as effective independently of whether they perceived it as more or less theoretical.

It was speculated that the respondents' years of professional experience would be significantly related to how they rated their formal library education in terms of effectiveness in preparing them for their current positions. This expected relationship was not supported by the data, however ($X^2 = 8.08$, $p = .23$, Cramer's $V = .11$).

The last question in the first section of the questionnaire was open-ended and asked for any comments or questions regarding education and training for university librarianship. One hundred and thirty-five participants responded, and some answers were over a page in length. The responses tended to fall into three broad categories: (1) the relative value of theoretical and practical education, (2) evaluations of formal library education, and (3) recommended content areas for university library education.

Respondents obviously had strong feelings as to whether formal library education should be primarily practical or theoretical. Twenty librarians indicated that library education should be more theoretical than practical; only 11 suggested that it should be primarily practical, but 27 stressed the importance of field experience and internships. Eleven individuals stated that students should get library work experience during their educational program, and 6 emphasized the desirability of having preprofessional experience before entering a formal program.

Eighteen participants noted that the best education would balance practice and theory. It is quite possible, however, that others who stressed one method over the other actually favored a mix of theory and practice but not in equal amounts.

Regarding evaluative comments about library education, reactions ranged from full satisfaction with formal education to considering it to be a waste of time. Three people stated that some of their courses had not been rigorous enough; others were of the opinion that the formal educational program could not possibly cover all relevant areas and should only be considered a beginning; 5 said that the two-year program should become the norm.

Several participants stressed the importance of specific content areas. The area mentioned most frequently (by 16 respondents) was management. Knowledge of a subject field was not far behind: 10 emphasized the importance of expertise in a subject discipline, and 11 called for a second master's degree. Other areas mentioned were computer technology, foreign languages, communication skills, and research methods. If these respondents are representative of research librarians, then there is no unanimity on the specifics of library education—content, approach, length.

Areas of Knowledge

For each of the fifty-six knowledge bases, the participants were asked to indicate how important each was for effective performance in their current positions and how much of the knowledge they cur-

rently possessed. The importance of each knowledge base was measured on a five-point scale with 1 representing essential; 2, very important; 3, important; 4, of little importance; and 5, of no importance. The amount of each knowledge base possessed by respondents was measured on a four-point scale: 1, extensive; 2, moderate; 3, slight; and 4, none. Table 2 provides a list of all fifty-six knowledge bases.

The first column shows the mean scores for the importance of the knowledge bases; the second gives the ranking for the mean importance scores, ranging from one (most important) to fifty-six (least important). The third column shows the mean scores for the amount of knowledge possessed; the fourth gives the corresponding ranks for the knowledge bases according to the mean scores for the amount of knowledge possessed.

As an examination of the listing in table 2 reveals, relatively traditional knowledge areas tended to be ranked relatively high in importance. The top twenty most important knowledge bases included bibliographic tools, reference sources, the reference interview, selection of materials, cataloging, classification, subject literature, bibliographic instruction, search strategy and online searching. Interspersed with these traditional core areas of librarianship are knowledge bases relating to management: communication skills, decision making, planning, personnel management, and staff development. The only knowledge bases in the top twenty that do not fit neatly into either of these two broad categories are library automation and knowledge of a subject field. Seven of the top twenty can be considered related to the provision of reference services, while five focused on management.

Examination of the remaining rankings indicates no obvious pattern or categorization. Some interesting, and sometimes surprising, observations are that knowledge of research methods is ranked relatively high (22d) while a related skill, inferential statistics, is ranked near the bottom (54th), and computer hardware (40th) is ranked considerably lower than computer software (28th) and library automation (16th). The history of books and

printing and the history of libraries are ranked 53d and 55th respectively, and knowledge of preservation/conservation was ranked rather low at 43d.

A comparison of the ranking of the knowledge bases by current importance with the ranking according to the amount of knowledge possessed by respondents suggested a fairly strong association between the two. To check this observation, a rank-order correlation (Spearman's r) was calculated for the two rankings. The computations produced a .91 correlation coefficient, which is significant at the .00 level and suggests a strong, positive correlation between the two rankings. In other words, the participants tended to rank the knowledge bases in roughly the same order, whether they were considering current importance or amount of knowledge possessed. The exceptions to this pattern are in the management area, e.g., decision making, planning, personnel management, staff training, and program evaluation techniques, where importance of knowledge is ranked high but amount of knowledge possessed is ranked low.

Importance of Knowledge and Experience

As noted earlier, one speculation was that the importance of current knowledge bases would vary with the number of years that the participants had been professional librarians. In order to determine which, if any, knowledge bases were significantly related to years of professional experience, the two variables were cross-tabulated.

The current "importance" ratings for several of the knowledge bases were found to be significantly related to years of professional experience. (Current importance was measured on a scale of 1 to 5, with 1 denoting "essential" and 5 representing "of no importance." The years of professional experience were grouped into three categories: less than one year to three, four to six, and seven to nine.) Table 3 lists all of the knowledge bases whose current importance ratings were related to years of professional experience at the .10, or higher, level of significance. The table provides the level of significance and Cramer's V value for each significant relation-

TABLE 2
 "IMPORTANCE" OF KNOWLEDGE BASE
 AND "AMOUNT" OF KNOWLEDGE

Knowledge Base	Importance of Knowledge		Amount of Knowledge	
	Mean Score (1-5)	Rank	Mean Score (1-4)	Rank
Bibliographic Tools	1.67	1.5	1.39	1
Oral Communication Skills	1.67	1.5	1.76	8
Writing Skills	1.71	3	1.53	2
Specialized Reference Sources	1.95	4	1.63	4
Decision Making	2.05	5	2.03	18
Search Strategy	2.07	6	1.58	3
Subject Field	2.10	7	1.64	5.5
General Reference Sources	2.17	8	1.64	5.5
Planning	2.20	9	2.12	20
Online Searching	2.38	10	1.86	9
Reference Interview	2.39	11	1.70	7
Selection of Materials	2.41	12.5	1.87	10
Catalog Codes/Rules	2.41	12.5	1.95	13.5
Personnel Management	2.42	14	2.23	27
Subject Cataloging	2.43	15.5	2.01	17
Library Automation	2.43	15.5	2.13	21
Subject Classification	2.48	17	1.94	12
Structure of Subject Literature	2.53	18	1.99	16
Bibliographic/Library Instruction	2.55	19	1.98	15
Staff Training and Development	2.56	20	2.36	32
Filing	2.59	21	1.92	11
Research Methods	2.68	22	1.95	13.5
Collection Evaluation	2.72	23	2.22	25
Nonbook Formats	2.78	24	2.22	25
Acquisitions Procedures	2.82	25	2.17	22
Teaching Methods	2.84	26	2.25	28
Higher Education	2.89	27	2.08	19
Computer Software	3.01	28	2.53	38
Budgeting	3.02	29	2.57	40
Management Theory	3.04	30	2.45	36
Foreign Language	3.05	31	2.21	23
Collection Weeding	3.06	32	2.37	33
Resource Sharing	3.08	34	2.33	29
Program Evaluation Techniques	3.08	34	2.79	49
Networks	3.08	34	2.35	30.5
Space/Work Environment	3.09	36	2.52	37
Publishing Industry	3.12	37	2.42	34
Cataloging of Special Materials	3.18	38	2.62	45
Computer Hardware	3.20	39	2.62	45
Indexing	3.23	40	2.35	30.5
Serials Control	3.25	41	2.63	47
Preservation/Conservation	3.28	42	2.62	45
Copyright	3.29	43	2.44	35
Collection Storage	3.38	44	2.59	42
Approval Plans	3.39	45	2.56	39
Circulation Services	3.42	46	2.22	25
System Analysis	3.48	47	2.86	53
Circulation Systems	3.61	48	2.60	43
Cooperative Acquisitions	3.68	49	2.82	51
Security Systems	3.74	50	2.82	51
Commercial or External Cataloging Services	3.76	51	2.82	51
Computer Programming	3.81	52	2.99	54
History of Books/Printing	3.87	53	2.58	41
Inferential Statistics	3.94	54	3.29	55
History of Libraries	4.16	55	2.67	48
Collective Bargaining	4.28	56	3.35	56

ship. The knowledge bases are sequenced from the highest to the lowest Cramer's V.

As shown in table 3, there are sixteen knowledge bases whose current importance was significantly related to years of professional experience. Their Cramer's V values ranged from .24 to .15 and would have to be considered relatively low. With a few exceptions, these sixteen knowledge bases tend to fall into two broad areas—management and computer technology.

In order to probe the nature of the relationship between these sixteen knowledge bases and experience, they were cross-tabulated with each of the three experience groupings. This analysis revealed nine knowledge bases that seemed to be important to respondents with less than four years of professional experience. Those knowledge bases considered essential, very important, and important in more than 50 percent of the responses were planning, writing skills, decision making, personnel management, non-book formats, computer hardware, staff training and development, teaching methods, and computer software. Of those nine areas, planning, writing skills, and decision making appeared to be especially important to the librarians with the least amount of experience. (To be selected as the most important, at least 75 percent of the respondents had to rate the

knowledge base as essential, very important, or important.)

A similar analysis found that all but three of the sixteen knowledge bases were considered relatively important by the participants with four to six years of professional experience. The three exceptions were computer programming, collective bargaining, and approval plans. Once again, the knowledge bases considered particularly important were planning, writing skills, and decision making, as well as personnel management and staff training and development.

Thirteen knowledge bases were considered relatively important by the most experienced librarians in the study, and they are the same thirteen areas identified by the middle group, with one exception—system analysis was replaced by approval plans. The knowledge bases with the highest ratings in terms of importance were planning, writing skills, decision making, personnel management, staff training and development, and teaching methods.

The management areas were most likely to be identified as being the most important for effective job performance. Also, the number of management areas perceived as being the most important tended to increase as the number of years of experience increased.

TABLE 3
CURRENT IMPORTANCE OF KNOWLEDGE
BASE AND YEARS OF PROFESSIONAL EXPERIENCE

Knowledge Base	Level of Significance	Cramer's V
Planning	.00	.24
Computer Programming	.00	.21
Writing Skills	.00	.20
Decision Making	.00	.19
Management Theory	.01	.19
Budgeting	.01	.18
System Analysis	.02	.18
Personnel Management	.02	.17
Nonbook Formats	.02	.17
Computer Hardware	.03	.17
Program Evaluation Techniques	.03	.17
Staff Training/Development	.06	.16
Teaching Methods	.06	.16
Collective Bargaining	.08	.16
Computer Software	.08	.15
Approval Plans	.10	.15

Importance of Knowledge and Library Position

Twenty-seven of the knowledge bases, as represented by their importance rankings, related significantly (at the .10 level) to the current library positions held by the participants in the study. (The categories of library positions were nonadministrative, department or unit head, assistant department head, assistant director, associate director, director, and other.) A complete listing of the knowledge bases significantly related to current position can be found in table 4.

An examination of table 4 does not suggest the small number of logical groupings found when the knowledge bases were related to years of professional experience (table 3). It is interesting, however, that at least eight of the knowledge bases most strongly related to current library position are closely involved with management. The bivariate relationships were about as would be expected, in that the higher the administrative level, the more importance

generally attached to knowledge of management-related skills. For example, budgeting knowledge was considered essential by only 9.6 percent of the nonadministrative librarians, but 32.8 percent of the department heads and 66.7 percent of the assistant directors rated it essential. The range of Cramer's V values was similar to those for the previous group, though the high value was .30 as opposed to .24.

Importance of Knowledge and Library Unit

All but eight of the fifty-six knowledge bases, when rated according to current importance, were significantly related to the participants' current library units. (The departments or units were categorized as public services, technical services, administrative services, systems, subject or divisional library, and other.) A contrary finding would have been surprising, as one would expect a librarian's current work assignment generally to influence his or her perceptions of importance in ar-

TABLE 4
CURRENT IMPORTANCE OF KNOWLEDGE
BASE AND CURRENT LIBRARY POSITION

Knowledge Base	Level of Significance	Cramer's V
Personnel Management	.00	.30
Staff Training/Development	.00	.25
Management Theory	.00	.23
Planning	.00	.22
Budgeting	.00	.22
Decision Making	.00	.21
Space/Work Environment	.00	.20
Security Systems	.00	.20
Preservation/Conservation	.00	.19
System Analysis	.00	.19
Circulation Services	.00	.18
Acquisitions Procedures	.00	.18
Writing Skills	.00	.17
Collection Storage	.01	.17
Circulation Systems	.01	.16
Copyright	.02	.16
Resource Sharing	.02	.16
Inferential Statistics	.04	.16
Search Strategy	.02	.15
General Reference Sources	.02	.15
History of Books/Printing	.03	.15
History of Libraries	.05	.15
Filing	.06	.15
Program Evaluation Techniques	.06	.15
Teaching Methods	.08	.14
Indexing	.09	.14
Computer Programming	.09	.14

eas of professional expertise. The eight knowledge bases *not* significantly related to library unit were as follows:

1. collective bargaining
2. planning
3. decision making
4. personnel management
5. staff training and development
6. management theory
7. approval plans
8. nonbook formats

Obviously all but the last two of these knowledge bases are closely related to management and supervision. This occurrence might be explained by the fact that management skills and techniques are somewhat generic, or their importance is independent of library unit. The same might be suggested for approval plans and nonbook formats, since librarians in various positions and departments participate in selection activities.

The range of Cramer's V values for the forty-eight knowledge bases significantly related to current library unit was somewhat greater than for the preceding two groups. The lowest Cramer's V was .16, and the highest was .43.

Amount of Knowledge and Library Unit

When rated according to the amount possessed, most of the knowledge bases were significantly related to current library unit. (Amount of knowledge was rated on a scale of 1 for "extensive" to 4 for "none.") In fact, all but seven of the knowledge bases were found to be significantly related to library unit; the *exceptions* were

1. acquisitions procedures
2. approval plans
3. cooperative acquisitions
4. higher education
5. research methods
6. oral communication skills
7. writing skills

Among these seven knowledge bases, the final four would tend to be more or less important regardless of the librarian's current department or unit, so it is not surprising that they were not significantly related to unit. It is surprising that the first three, all of which deal with acquisitions, were not related to current library unit. An

examination of the bivariate frequencies for the three relationships reveals that librarians in administrative services and other units claimed considerable knowledge of these areas. This phenomenon tended to smooth out the distributions, minimizing the impact of the technical services librarians' high level of knowledge. Hence, the chi-square values were not significant.

The Cramer's V values for this group of bivariate relationships ranged from .16 to .40 with a mean of .24. The mean values for the first three groups were .18, .20, and .25, respectively. A comparison of these means indicates that there may be a stronger association between knowledge bases and current unit than between knowledge bases and both current position and years of professional experience.

CONCLUSIONS

A primary focus in this study of academic research librarians was to identify the amount and importance of their professional knowledge as influenced by or related to their years of professional experience, their current position, and the division of the library organization in which they work.

The fifty-six knowledge bases were identified on the basis of an understanding of traditional assignments held by librarians as well as a recognition of new positions/assignments occurring in the profession. In addition, a review of the literature that focused on librarian competencies was conducted to determine what had been investigated previously.

The preliminary assessment of the study results indicates patterns in several areas that should have significance for library education, training, and development. For example, the findings suggest that while a traditional core library knowledge is still highly valued, knowledge of management and automation are also highly valued by this group of librarians.

However, it is in these categories—management and automation—that the librarians indicated a corresponding lower level of actual knowledge. In other words, the respondents indicated that certain management and automation knowledge

was highly important but that they lacked a substantial amount of it. For example, planning, personnel management, and staff training/development were ranked high in importance but low in knowledge; this was also true for oral communication.

The relationship of years of professional experience to knowledge bases was significant for sixteen of the categories, and seven of these could be viewed as management-related; two, automation-related; and five (writing, system analysis, program evaluation techniques, teaching methods, and approval plans), applicable to any professional position. While the relationship between years of professional experience and knowledge bases was not as strong as expected, it did indicate that as librarians move through their careers, assuming new and different assignments, they will need to acquire new knowledge and skill or acquire a different *depth* of knowledge and proficiency.

The relationship of current position to knowledge bases indicated a stronger relationship, particularly for management-related knowledge. Again, some knowledge bases that were significantly related to a librarian's position raise troubling questions. For example, competency in writing, system analysis, inferential statistics, and program evaluation techniques should be viewed by librarians as basic professional skills that are not strongly tied to a particular position.

It is clear that a number of nontraditional knowledge bases are viewed as important by librarians within this sample of university libraries. While the relationship of years of experience to these bases is not strong, the results still suggest that these areas of knowledge will be increasingly important as librarians progress through their careers.

The librarians also indicated that their education was more theoretical than practical. Their assessment of the effectiveness of their formal library education in preparing them for their *current* positions was not conclusive. The mean score was near the midpoint between agreement and disagreement, but librarians were slightly

closer to agreeing that their education had been effective. They indicated a more strongly positive view toward their experience with continuing education and staff development. These responses suggest that post-master's educational activities were more effective in preparing them for their *current* positions.

The results indicate that while educators should review curricula needed by librarians in both the traditional core areas and the developing knowledge areas, they also should continue to address the provision of continuing education courses for practitioners. The results also suggest a need for library administrators to strengthen staff development programs. Once librarians are in the profession, they will need ongoing support from their organizations in providing opportunities for continued learning; currently continuing education/training is needed most in management and automation.

It is possible that the complaints about knowledge and education may not be grounded so much in what librarians learn and know but how they implement their knowledge once they are in a library setting. If this is the case, the situation would need to be addressed through means other than strengthening the curriculum and would require giving greater attention to the recruitment of students into the master's program and into academic research libraries.

The data provided by this study suggest additional areas for review and analysis of library education and the performance of professional activities in academic research libraries. Specifically, a closer examination could be made of the relationship between the value of a specific knowledge base and where it could be acquired most effectively. In addition, a careful scrutiny of demographic data (sex and age of respondents) could determine if any relationship exists between these factors and perceived need for specific knowledge, and a further review of the relationship between type of position and knowledge needed for effective performance would also be desirable.

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