ILLiad Delivery Cover Sheet

The Application of Relative Use and Interlibrary Demand in Collection Development

William Aguilar

ABSTRACT. The procedures by which library collections can be evaluated are quite diverse, and some are rather complex. The methodology suggested here makes use of holdings data, circulation records, and interlibrary loan statistics. This information is readily available in most libraries, and when properly applied produces a powerful analytical tool.

INTRODUCTION

With the application of a few basic mathematical techniques it is possible to make administrative decisions in areas such as collection development and the retrospective conversion of card files to machine readable form. All that is required is knowledge of holdings, circulation, and interlibrary loan requests. The information is collected on a subject-by-subject basis, and the level of specificity can be as broad or as precise as desired. The techniques are not novel, but rather result from an extensive review of collection development literature. Lancaster has categorized collection development in three ways through use of quantitative, qualitative, and use factors.[1]

Collection Evaluation Using Quantitative Techniques

Quantitative approaches to the evaluation of a collection can take one of several forms, perhaps the most common of which is to judge the collection by its absolute size. The basic assumption is that a positive correlation exists between quantity and quality, and that the probability of meeting the needs of users is greater in a larger col-

William Aguilar, PhD Library and Information Science, is Director of Library Services, Central Connecticut State University, New Britain, CT 06050.

Collection Management, Vol. 8(1), Spring 1986

lection. Quantity can be relatively easy to gauge since it only requires that items be counted; however, the issue of how materials should be counted remains. For example, does one count titles, volumes, or linear feet of materials? Do one or two microfiche equal a bound volume, and how should reels of microfilm, journals, audiovisuals, etc. be counted? Lynch has addressed this definitional problem in an effort to bring about standardization in the use of terms. Implementation of the Lynch/Eckard recommendations, however, has yet to be achieved.[2]

A factor closely allied to absolute size is evaluation in terms of growth of the collection. This approach recognizes that current materials are more frequently used; consequently, the number of additions to a collection is of paramount importance. Collection growth can be measured by counting the number of acquisitions or by the amount of money expended. It can also be related to size of the community of users (items per capita), or it can be evaluated by subject area.

Evaluations based on formulae, such as those of Clapp-Jordan,[3] Washington State,[4] and Voigt[5] bring in additional variables. Typically, each formula begins with a basic number for the core collection, which is then expanded with the inclusion of other variables, i.e., degrees offered, major fields of study, number of faculty, undergraduates, and graduates. One of the major criticisms of the formula method is that although formulae represent minimal standards, some may interpret them to be maximum standards. Rogers and Weber also point out that the Clapp-Jordan formula does not distinguish between demands placed on libraries by users in different disciplines, but rather assumes that demands will be uniform.[6]

Collection Evaluation Using Qualitative Techniques

Qualitative evaluation of collections tends to be far more subjective. Hirsch suggest two qualitative methods—impressionistic and list checking.[7] In the impressionistic, scholars, bibliographers, or other subject specialists subjectively evaluate the quality of a collection. Obviously, the worth of the evaluation is dependent upon the skills and knowledge of the evaluators. Major drawbacks can include the absence of evaluators, the numerous evaluators needed, and the costs associated with the process, particularly if the evaluators are brought into the institution for the occasion.

List checking entails a comparison of the collection against standard lists, library catalogs, or bibliographies. Common criticisms of this method include the short life expectancy of lists, the realization that lists used for evaluation may have been used for building the collection, and that lists do not provide for comparable books owned by a library but not appearing on the list.

Examples of studies that incorporate list checking procedures include those conducted by Coale,[8] McInnis,[9] and Goldhor.[10] Coale compared the Latin-American colonial collection of the Newberry Library against sources consulted by researchers in their writings. Coale's primary concern was, "Could these books have been written here?" McInnis used the same basic procedure but used a random sample of bibliographic references from the literature. Goldhor's "inductive" technique consisted of searching numerous bibliographic sources, such as book review journals, book selection tools, and retrospective bibliographies. Using this technique, books that were frequently listed were considered desirable, books not found were viewed as probably not desirable, and books found only once were held to be of borderline quality.

Use Factors

A major limitation of quantitative and qualitative measures is that they apply to the collection in isolation, and not directly to its use. It is the use factors approach that seems to merit greater consideration. As stated by Bonn, "Every library exists chiefly to serve the needs of its own community of users. It follows, then, that any overall evaluation of a library ought to be based chiefly on how well it does, in fact, serve those needs."[11]

The utility of information based strictly on circulation, however, is of limited use. All things being equal, it is expected that those subjects constituting the largest part of a collection will account for the heaviest circulation. Accordingly, the theory of use relative to holdings was developed by writers such as Jain,[12] and Bonn.[13] The fundamental premise of this theory is that circulation should be considered vis-à-vis the corresponding holdings. For instance, subject A may provide for ten percent of all circulation, but before that information is put to specific use, the size of the holdings (expressed as a percentage of the total circulating collection) should be ascertained.

By way of example, the application of Bonn's "use factor" is shown in Table 1. Subjects may be defined as narrowly or as broadly as desired; number of holdings for the subject is ascertained, and the percentage of total circulation represented by that subject is computed. In this instance, subject A represents 14.2% of the total holdings. Circulation figures are computed in the same manner. The "use factor" is arrived at by dividing the circulation percentage of a given subject, by the holdings percentage of the same subject. In this case, subject A provides 27.73% of all circulation, yet it accounts for only 14.2% of holdings, thus providing a "use factor" of 1.95. It becomes apparent then that subject A is being overused vis-à-vis the holdings.

It should be pointed out that holdings may be determined by counting volumes or titles. If a choice is available, titles may be preferred since the number of titles owned by a library may more accurately reflect its strengths and/or weaknesses.

The application of Bonn's "use factor," however, takes on greater significance as refined by Mills.[14] As shown in Table 2, Mills has taken Bonn's resultant "use factor" multiplied it by 100, and created the concept of "percentage of expected use." This concept suggests that the expected use of a subject will be 100 percent. Subjects that are above 100 percent may be defined as overused; those below 100 percent may be defined as underused.

Table 1

USE BASED ON CIRCULATION

SUBJECT	HOLDINGS (%)		CIRCULATION (%)		USE FACTOR
A	6050	(14.20)	2050	(27.73)	1.95
B	1341	(3.15)	315	(4.26)	1.35
C	6638	(15.58)	812	(10.98)	.70
D	4815	(11.30)	217	(2.94)	.26
-					
-					
Totals	42598	(100)	7392	(100)	

Table 2

APPLICATION OF THE PERCENTAGE OF EXPECTED USE

SUBJECT	HOLDINGS (%)		CIRCULATION (%)		PERCENT OF EXPECTED USE
A	6050	(14.20)	2050	(27.73)	195%
B	1341	(3.15)	315	(4.26)	135%
C	6638	(15.58)	812	(10.98)	70%
D	4815	(11.30)	217	(2.94)	26%
-					
-					
Totals	42598	(100)	7392	(100)	

The threshold distinguishing overuse and underuse, however, warrants exploration. It is possible to subjectively define lines of demarcation, and to consider anything below or above those cut-offs as underused and overused, respectively. Dowlin and McGrath[15] have chosen to use a more scientific methodology. Specifically, the "inventory use ratio" (equivalent to Mill's PEU) are listed in a continuum from low to high. Those subjects with an "inventory use ratio" one standard deviation below the mean are defined as underused, and those with an "inventory use ratio" one standard deviation above the mean are defined as overused.

Ratio of Borrowing to Holdings

Circulation data in and of itself may be viewed skeptically by some, and so require confirmation. By comparing local use with interlibrary loan data it is possible to confirm or deny the results of local analysis. All that is required is the formatting of filled requests into the same subject categories used in circulation analysis. Most frequently this entails tallying filled requests by call number. Unfilled interlibrary loan requests are not considered because corresponding circulation data reflects filled demands.

Although it is possible to compare raw interlibrary loan figures with a relative figure (PEU), this procedure is not recommended. Such a comparison would tend to negate or minimize the frequency of interlibrary loans which in comparison to an institution's strength in a particular subject class could in fact be high. The PEU figures measure use relative to holdings; the same yardstick should then be used to measure interlibrary loans.

Accordingly, the "ratio of borrowings to holdings" (RBH) was developed. This ratio compares the number of interlibrary loans relative to the holdings. It is generated in the same way as Mills' "percentage of expected use." The formula below demonstrates the mathematical procedure used to generate the RBH:

$$\frac{\%\ \text{of Borrowings}}{\%\ \text{of Holdings}} = \text{Ratio of Borrowings to Holdings}$$

Once the RBH has been computed for each subject, they can be arranged in a continuum from low to high. Those that are one standard deviation below the mean can be defined as underused; those one standard deviation above the mean as overused.

Application

In a "management information system" framework, the methodology indicated here offers an alternative to other methods of collection analysis. Specifically, by use of Mills' "percentage of expected use" (PEU) and the "ratio of borrowings to holdings" (RBH), it is practical and feasible to evaluate the use of a collection. Once the thresholds of overuse and underuse have been established, it is possible to apply the decision table shown in Table 3.

The advantage of this approach is that it allows for confirmation of each individual subject's use, however broadly or narrowly defined. The determinants used in establishing the threshold of overuse and underuse can be modified based on the local situation. As noted earlier, Dowlin and Magrath suggest that the threshold of overuse and underuse should be based on the use of the standard deviation. Those subject classes that are one standard deviation above the mean, based either on local use or interlibrary loan, can be considered overused; those that are one standard deviation below the mean can be considered underused.

By use of this decision table it is possible to examine each individid-

Table 3

Decision Table for Determining

Overuse and Underuse

	RULES 1	2	3	4
PEU > +1 s.d	Y	Y	--	--
PEU < -1 s.d.	--	--	Y	Y
RBH > +1 s.d.	Y	--	Y	--
RBH < -1 s.d	--	Y	--	Y
BUY	X			
CONTINUE		X		
EXAMINE			X	
DON'T BUY				X

ual subject class at the institutional level and conclude if one of the four actions listed at the bottom of the decision table is warranted. Each of the four "rules" is examined individually:

Rule 1—indicates that a specific subject is being used heavily at the local level and, in addition, that the number of ILLs needed to supplement the local collection is high. As such, it would seem advisable to purchase additional or duplicate titles.

Rule 2—suggests that a subject is being used heavily at the local level, but it is not necessary to go outside for additional materials. This is really the ideal situation.

Rule 3—local materials are being underused; nonetheless, it is frequently necessary to go outside the institution for supplemental purposes. It would appear that something is wrong with the local collection and that subjects falling into this category should consequently be examined closely.

Rule 4—indicates that local materials are not being used; nor are those of other institutions. It would seem that this is a "dead" subject, and so materials in the subject area should not be purchased.

Understandably, not all subjects will fall into these four categories—some may be neither overused nor underused based on the PEU and the RBH. However, it is these four that warrant the greatest attention.

The significant point suggested here is that demand for additional or duplicate titles in overused subject classes can be verified by demand for additional or duplicate materials via interlibrary loan. Correspondingly, low demand for materials in underused subject classes can be verified by low levels of demand for interlibrary loans. From a library management perspective, the findings suggest that because local resources in overused subject classes are inadequate additional materials are needed. On the other hand, the purchase of materials in underused areas is questionable.

PEU and RBH Applied to Retrospective Conversion

In their historic study, Fussler and Simon[16] suggested that the best predictor of future use was previous use. Unfortunately, most libraries do not keep track of circulation on a title by title basis. The next best thing, then, is knowing which subject areas receive the most use. Such information is particularly useful in planning retrospective conversion projects.

Although it is possible to convert subject areas that have a high rate of circulation, a preferable method would consider circulation relative to holdings. This preferred procedure recognizes the possibility, in a probabilistic sense, that items that are converted will be used again.

The PEU provides such information quite readily. Once the PEU figures have been calculated, they can be arranged from high to low, and areas producing high ratios converted first while those with low ratios converted last, if at all. If so desired, libraries may confirm findings by comparing PEU data with the RBH.

This procedure works well for subject areas at either extreme. Those in the middle range, however, will require further analysis. In these instances, libraries are advised to consider publication date as an added variable in establishing conversion priorities.

Although the computation of the PEU and the RBH figures may be cumbersome to undertake manually, this requires no more than a hand-held calculator. Those having access to a microcomputer will find that spreadsheet-type packages, such as Multiplan, Lotus 1,2,3, etc., can easily handle this type of analysis. All that is required, on a subject-by-subject basis, is knowledge of holdings, circulation, and the number of interlibrary borrowings filled. Armed with these bits of information it is possible to produce some very powerful and insightful tools about collections and their use.

REFERENCES

1. F. W. Lancaster, *The Measurement and Evaluation of Library Services* (Washington, D.C.: Information Resources Press, 1977), p. 166.
2. Mary Jo Lynch and Helen M. Eckard, *Library Data Collection Handbook* (Chicago, Illinois: American Library Association, 1981).
3. Verner W. Clapp and Robert T. Jordan, "Quantitative Criteria for Adequacy of Academic Library Collections," *College and Research Libraries* 26 (September 1965): 371-380.
4. Interinstitutional Committee of Business Officers, *A Model Analysis System for program 05 Libraries* (Olympia, Washington: Evergreen State College, March 1970).
5. Melvin J. Voigt. "Acquisition Rates in University Libraries," *College and Research Libraries* 36 (July 1975): 263-271.
6. Rutherford D. Rogers and David C. Weber, *University Library Administration* (New York: H.W. Wilson Co., 1971), p. 291.
7. Rudolph Hirsch, "Evaluation of Book Collections," in *Library Evaluation*, ed. Wayne S. Yenawine (Syracuse: Syracuse University Press, 1959), pp. 7-20.
8. Robert Peerling Coale, "Evaluation of a Research Library Collection: Latin-American Colonial History at the Newberry," *Library Quarterly* 35 (July 1965): 173-184.
9. Marvin R. McInnis, "Research Collections: An Approach to the Assessment of Quality," IPLO Quarterly 13 (July 1971): 13-22.
10. Herbert Goldhor, "A Report on an Application of the Inductive Method of Evaluation of Public Library Books," *Libri* 31 (August 1981): 121-129.
11. George S. Bonn, "Evaluation of the Collection," *Library Trends* 22 (January 1974): 265.

12. Jain, "Sampling and Data Collection Methods for a Book-Use Study," *Library Quarterly* 39 (July 1969): 245-252.

13. Bonn, pp. 265-304.

14. Terry R. Mills, "The University of Illinois Film Center Collection Use Study," CAS Paper. (Urbana, Illinois: University of Illinois-Urbana, 1981), p. 4.

15. Ken Dowlin and Lynn Magrath, "Beyond the Numbers; A Decision Support System," in *Proceedings of the 1982 Clinic on Library-Applications of Data Processing.* (Urbana, University of Illinois, Graduate School of Library and Information Science, 1983).

16. Herman H. Fussler, and Julian L. Simon, *Patterns in the Use of Books in Large Research Libraries* (Chicago: University of Chicago Press, 1969).