Circulation statistics in the evaluation of collection development

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Abstract
Purpose – This article aims to describe how circulation statistics may be used to evaluate collection development policies.
Design/methodology/approach – The circulation statistics of books acquired by a science library in a specific year are analyzed by publisher, publication date, and subject.
Findings – The paper finds that older books circulated more than recently published titles purchased at the same time. Circulation averages varied considerably between publishers.
Research limitations/implications – Checkouts are an imprecise measure of value. Number of items not purchase costs is the denominator of all averages used; there is a data bias against inexpensive books.
Originality/value – The procedure outlined can be used generally to evaluate collection development policies.

Keywords Collections management, Monographs, Academic libraries

Paper type Research paper

Collection development is among the most important factors for library quality and among the most expensive aspects of library operation. Evaluation of recent acquisitions can provide quantitative feedback for improving future collection development. An analysis of the entire collection is necessary to determine holes in the collection, but an analysis of recent acquisitions is necessary to find areas of over-selection (Carrigan, 1996) and improve the process of collection development.

Library automation has improved access to circulation data, and several published studies (and likely some unpublished projects) have used circulation data in attempts to improve collection development and inform decisions on what should be sent to storage. David Carpenter and Malcolm Getz examined which subjects in the Vanderbilt economics collection had the highest percentage of books published during a specific year that had failed to circulate at all. They called these books "Type II errors." "Type I errors" were books that interlibrary loan requests indicate would have been highly used, but were not bought. Carpenter and Getz (1995) suggested using both statistics in reallocating the book budget. Ochola (2002) looked at average circulation and the ratio of interlibrary loan borrowings to holdings in Baylor libraries to determine how to reallocate collection development resources. An earlier study by Terry R. Mills of the University of Illinois's film collection also used usage statistics to adjust collection development priorities. Brush (2007) compared checkout numbers on recent approval plan books with the collection at large. Knievel *et al.* (2006) used interlibrary loan data, average circulation, and percent of items that circulated during a specific time period in order to inform collection development on a subject level. They suggest that a similar analysis could be performed examining books by publisher or language as well as by subject (Knievel *et al.*, 2006).

Methodology

The project at Indiana University's Swain Hall Library used average number of checkouts and percent of items that circulated as its key statistics. MARC records created in 2003 were sorted into categories for subject area, publisher, and publication date. Dissertations and books currently in non-circulating Reference were excluded. Checkouts and in-house uses had been recorded using the library's automation system. Swain Hall Library staff routinely had record in-house data since 2003. The methodology of study easily could be adapted to libraries that record only checkouts.

Spencer Anspach (Systems Analyst and Programmer) exported circulation and cataloging data into a spreadsheet. We sorted the data by accession date, and the records created in 2003 were copied to a new spreadsheet. Sorting by item type and location separated the reference books and dissertations. The remaining records were sorted first by call number. Mean and count statistics were performed on each call number range (see Table I). A new data column for the sum of checkouts and in-house uses was created. Each call number group was sorted by that sum, which quickly revealed how many items had received no use. The procedure was repeated for publisher and publication year (see Tables II and III).

The circulation data for each copy were totaled from the book's accession until May 24, 2007. Books acquired earlier have had more opportunity to be used than later arrivals. For that reason, only books acquired in a single year are included. The year 2003 was chosen, because it was recent enough to reflect current publishing trends and collection development practices and was far enough in the past for significant circulation to have taken place. The circulation data used in

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Table I 2003 acquisitions by subject

Call number, subject	Count	Average number of checkouts	Percent used
A-P, S, Z (Other)	15	18.8	87
Q1-999 (General science)	29	5.4	62
QA1-74, QA77-149 (General math)	90	4.5	62
QA75-76 (Computer Science)	141	6.7	65
QA150-272 (Algebra)	95	5.2	77
QA273-299 (Probability, Stats, Numerical methods)	90	7.2	76
QA300-433 (Analysis)	139	8.8	76
QA440-699 (Analysis and Topology)	78	6.2	76
QA700-999 (Mechanics)	27	6.4	67
QB (Astronomy)	110	2.2	47
QC (Physics)	315	4.3	58
QD-RZ (Chemistry, Biology, Medicine)	34	3.7	53
T (Technology)	88	5.0	65

Table II 2003 acquisitions by publisher

Publisher	Count	Average number of checkouts	Percent used
American Institute of Physics	38	1.3	24
American Mathematical Society	73	5.4	67
Astronomical Society of the Pacific	15	2.0	53
Birkhauser	56	4.6	63
Cambridge Unv. Press	78	5.5	78
Chapman & Hall/CRC	23	10.0	100
Kluwer Academic	94	2.7	44
North-Holland	19	1.3	32
Oxford Unv. Press	30	5.6	80
Prentice-Hall	18	12.4	94
Springer	303	5.0	65
Taylor & Francis	16	3.3	63
Wiley	84	8.9	86
World Scientific	100	3.1	61

Table III 2003 acquisitions by publication year

Publication year	Count	Average number of checkouts	Percent used
1995 or before	31	7.1	87
1996-2000	69	8.7	88
2001-2002	387	4.9	60
2003-2004	785	5.6	65

the statistics are for each copy, not each title (although duplicate copies are rare).

The standard problems with circulation data apply to this study. Checkouts and in-house uses do not perfectly measure a book's usefulness to a patron. Faculty and graduate students can checkout most books for 120 days, in which time great research may be done. Other titles are placed on two-hour or 24-hour reserves. Some books that are predicted to be high demand (e.g. required textbooks) are under a seven-day loan policy. Of course, some books are borrowed and returned without being read. The quality of in-house use varies as well. An in-house use may represent hours of studying or just a decision not to checkout the item. The circulation data used treat an original checkout and a renewal identically. Thus, patrons in the practice of frequently renewing all their books may have substantial influence on the average number of checkouts of entire classes of books. Many of the problems that afflict circulation data also plague alternative value measures like sales data or informal perceptions of use.

Another limitation of this study is that it examines only circulation per item and ignores the shelf space or price of the item. To a library with space and budget constraints, checkouts per meter of shelf space or usage per dollar of acquisitions budgets might be more relevant than checkout per item. Fewer checkouts from a thin, inexpensive book might be completely acceptable. Ignoring item cost and size creates a bias in the result against publishers producing small, low-cost books and against subjects in which such books are more common.

This study only measures usage in the first four years. In many libraries, this may not be accurate indicator of a value of an acquisition to the library over the generations. In an academic science library, however, current use may be one of the indicators of use over any planning horizons.

Swain Hall Library specifics

The Swain Hall Library is a branch library at Indiana University Bloomington (IUB) that specializes in mathematics, computer science, astronomy, and physics. IUB has doctoral programs in all four subjects with facility and students active in research. To support these departments the library also holds some engineering and biology books.

While the books studied here were being acquired, the University was establishing a School of Informatics and a biophysics group. IUB has separate branch libraries for Geology, Chemistry, and Life Sciences. IUB does not have any engineering programs, so the patrons to the Swain Hall Library differ from those to many other science libraries.

The Swain Hall Library has over 70,000 items in its catalog. About 45,000 books are housed in the library. Math books compose almost half of the monograph collection. The library averages 1,000 acquisitions per year. The Swain Hall Library maintains stability in overall collection size by sending low-use items to an auxiliary storage facility.

During 2003, the Swain Hall Library used approval purchase plans administered by Academic Book Center and Blackwell. Firm order purchase supplemented the approval plans. Librarians selected books for firm order by an informal mix of faculty and student recommendations, book reviews, and interlibrary loan requests. The Academic approval plan was terminated in 2003. Fewer acquisitions are now acquired through approval plans, but current collection development practices are similar enough that the evaluation of 2003 acquisitions may improve the usefulness of future acquisitions.

An intercampus delivery system allows patrons in the IU system to request and checkout books from any library in the system. The checkout statistics used here reflect checkouts by anyone, including interlibrary loans to users outside of the university. Patrons also checkout books delivered from other IU libraries at the Swain Hall Library circulation desk. Those books are not counted in this study.

Results

Circulation statistics among the 2003 acquisitions indicate that math books are receiving the most use. The astronomy collection lagged behind all other subjects in the percentage of items used and the average number of checkouts. This could result from more patron interest in math and less in astronomy or from better collection development in math than in astronomy. Respective solutions would be a review of collection development techniques in lagging subjects and reallocations of acquisition budgets from less used subjects to more used subjects. The degree of uniformity in circulation signals success in the balancing the new books budget among the different subjects at the Swain Hall Library.

Usage among acquisitions from different publishers varied much more. All of the 23 Chapman & Hall/CRC titles that were purchased circulated. Only nine of the 38 American Institute of Physics books acquired ever circulated, and none of them were checked out more than seven times. Books published by Cambridge University Press, Prentice-Hall, Wiley, and the Oxford University Press were also well received by library patrons.

These results are not designed to measure the overall quality of a publisher, rather the usefulness of recent acquisitions to Swain Hall Library patrons. These results do not isolate the publisher effect from the subject effect or any other consideration. Publishers specializing in areas of lower patron interest may have lower numbers. Also, the Swain Hall Library is more selective in its purchasing from some publishers than others. The Swain Hall Library collects almost every relevant Cambridge University Press title, but buys only those Prentice-Hall books judged most useful. These results indicate from what publishers the Swain Hall Library should be more selective and from what publishers it should be eager to purchase. Results for other libraries would depend on their patronage and collection development habits, and they may vary considerably.

New research can make older books obsolete, especially in the sciences. Despite this, books purchased more than three years after their publication circulated more than the average recently published acquisition. The Swain Hall Library was more selective in purchasing older books, so the books purchased met a higher quality standard. For older books, collection developers may make better use of faculty recommendations, citations, reviews, and other libraries' holdings. In the Swain Hall Library, older books were more likely to be acquired through firm order than approval plans.

Implications and conclusions

For the Swain Hall Library, this study indicates success and failures in collection development. In almost every subject, most of the books purchased in 2003 have been used. The circulation data suggest the balance of subjects in the books acquired was good. The Swain Hall Library, however, purchased far too many unused books from certain publishers.

Print copies of American Institute of Physics conference proceedings rarely circulated and were deselected from the approval plan even before this study. Publisher reputation had always been a factor in firm order selection; now quantitative data indicates which publishers respond to patron demand. Informed modification of approval plans also can be made.

Although the results of this analysis are specific to the Swain Hall Library, the techniques of the analysis are not. Libraries may use similar procedures to evaluate and to improve their collection development.

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