



2-12-2009

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Recommended Citation

Walker, Stephanie, "Purchase of Journal Portfolios by Research Libraries is not Cost-Effective and May Lead to Normalization of Collections" (2009). *Librarian Publications*. 4.

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Evidence Summary

Purchase of Journal Portfolios by Research Libraries is not Cost-Effective and May Lead to Normalization of Collections

A Review of:

Murphy, Sarah Ann. "The Effects of Portfolio Purchasing on Scientific Subject Collections." College & Research Libraries July 2008: 332-40.

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Received: 14 December 2008

Accepted: 12 February 2009

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Objectives – To determine whether the purchase of journal portfolios (i.e., packages of journals purchased as a group from publishers, such as Elsevier’s ScienceDirect) from publishers is an effective means of meeting research needs for faculty in the life, medical, physical, and applied sciences, and to determine the effects of such purchases on research library collections.

Design – Citation analysis.

Setting – Ohio State University libraries in the life, medical, physical, and applied sciences.

Subjects – A total of 253,604 citations from 6,815 articles published between the years 2003 and 2005 by Ohio State University faculty in the life, medical, physical, and applied sciences were

analyzed using the Bradford distribution (an explanation of the Bradford Distribution is provided later in this review).

Methods – Using ISI’s Science Citation Index, the author generated a list of articles published by Ohio State University (OSU) faculty in the life, medical, physical, and applied sciences between the years 2003 and 2005. The author then assigned each article to a specific discipline, according to the OSU College of the first OSU author listed. For example, if an article was written by several co-authors, and the first OSU author listed was a faculty member in OSU’s College of Dentistry, the article would be designated a Dentistry article. Multidisciplinary works were assigned to the college of the first OSU author listed. (The OSU Colleges

considered to be part of the study were the College of Biological Sciences; the College of Dentistry; the College of Engineering; Food, Agriculture, and Environmental Sciences; the College of Mathematical and Physical Sciences; the College of Medicine; the College of Optometry; the College of Pharmacy; and the College of Veterinary Medicine.) Books, conference proceedings, theses, and other non-journal materials were excluded from the set of citations considered.

Next, the author pulled journal citations from each article, again utilizing Science Citation Index. The references were analyzed to determine the number of times each individual journal had been cited. The author then created a list of journals which had been cited in articles by OSU faculty in the various colleges, grouped by college. The journals were arranged in descending order, according to the number of times each journal had been cited. Thus there would be, for example, a list of all journals cited in articles published by faculty members in the OSU College of Dentistry between 2003 and 2005.

Most journals had been cited only once over the three-year period. A total of 2,407 journal titles were cited 10 or more times. In total, the author analyzed 253,604 citations from 6,815 articles.

A Bradford distribution of journal citations was calculated, and journals were divided into three categories. The three categories were called Zones 1, 2, and 3, with Zone 1 being core journals for the faculty, Zone 2 being more secondary titles, and Zone 3 being those cited least frequently. For those not familiar with this type of analysis, a definition of Bradford's law is available on the U.S. National Institute for Standards and Technology website. It is included here for ease of reference: "Journals in a field can be divided into three parts, each with about one-third of all articles: 1) a core of a few journals; 2) a second zone, with more journals; and 3) a third zone, with the bulk of journals.

The number of journals is $1:n:n^2$. Note that Bradford formulated his law after studying a bibliography of geophysics, covering 326 journals in the field. He discovered that 9 journals contained 429 articles, 59 contained 499 articles, and 258 contained 404 articles. Although Bradford's Law is not statistically accurate, librarians commonly use it as a guideline" (Black).

The author then determined how the OSU Libraries purchased access to each title. The three options analyzed were:

- 1) through OHIOLink (through which OSU Libraries purchase the bulk of the journal portfolios to which they subscribe),
- 2) through the independent purchase of an electronic subscription, or
- 3) through the independent purchase of a print subscription.

The cost for each title was calculated by taking the amount paid for OHIOLink subscriptions and removing the cost of non-scientific journals from the total amount. Pricing for the non-scientific journals was obtained using EBSCO's *Librarian's Handbook 2006-2007* and *Ulrich's Periodical Directory*. To account for inflation, any 2007 prices were adjusted by 6.

The above activities were designed to calculate both the cost of each title as purchased through OHIOLink, and what the OSU Libraries would have paid for each individual title if it had been purchased separately.

Main Results – Of all journals cited by OSU faculty in the life, medical, physical, and applied sciences during the years studied, only 7% were available in print format only. The percentage of cited journal titles that were included in portfolio purchases varied considerably across the colleges. The college for which the greatest percentage of cited journals were obtained via OHIOLink was the College of Mathematical and Physical Sciences; 85.7% of journals cited by this

College were purchased via OHIOLink. Overall figures for the cited journals analyzed were as follows: 52.0% were purchased via OHIOLink portfolio purchases, and 26.3% were purchased individually in electronic format by the OSU Libraries.

Of all journals listed in Zone 1 (those designated as “core journals” for the fields in question), 100% had electronic versions, though OSU Libraries continued to subscribe to the print version in addition to the electronic version for five titles, due to embargoes of 4-12 months in the electronic subscriptions. In terms of how the Zone 1 journals were acquired, 35.5% were purchased via OHIOLink as part of a portfolio purchase, and 62.2% were individually purchased.

For the College of Biological Sciences; the College of Food, Agricultural, and Environmental Sciences; the College of Medicine; the College of Nursing; the College of Pharmacy; and the College of Veterinary Medicine, fewer than 40% of the Zone 1 (core, most highly cited) titles for their disciplines were purchased via OHIOLink. For the College of Mathematical and Physical Sciences, 75.5% of Zone 1 titles were purchased via OHIOLink. This figure was 60.5% in the College of Engineering. By contrast, over 50% of the titles in Zone 1 for the Colleges of Dentistry, Nursing, Pharmacy, and Veterinary Medicine were purchased individually, and not via portfolio purchases from OHIOLink. The author notes that in these fields, the majority of research is published in journals from professional societies or smaller publishers, which have neither the high profile nor the market that some journals in other fields have, and thus are frequently not included in portfolios available via consortia such as OHIOLink.

The author also provides a numerical breakdown, showing exactly how many titles in each of Zones 1, 2, and 3 were purchased via OHIOLink, how many were purchased directly by OSU in electronic form, and how many were

purchased in print form, for each college and for all colleges combined. For all colleges combined, the overall results are as follows:

- Zone 1 included 45 cited journal titles. Of these, 16 were purchased via OHIOLink, 28 were purchased in electronic format directly by OSU, none were purchased in print, and one was considered “Other” (not at OSU, ceased, or cancelled).
- Zone 2 included 299 cited journal titles. Of these, 167 were purchased via OHIOLink, 109 were purchased in electronic format directly by OSU, 13 were purchased in print, and 10 fell under “Other”.
- Zone 3 included 2,063 cited journal titles. Of these, 1,068 were purchased via OHIOLink, 497 were purchased in electronic format directly by OSU, 155 were purchased in print, and 343 fell under “Other”.

The author also provides a list of the top 50 journals cited, including the number of citations linked to each title and how the title was purchased. Of the top 50 journals, 32 were purchased directly by OSU Libraries in electronic format, and only 18 were purchased via OHIOLink.

Interestingly, however, 70% of OSU Libraries’ total expenditures on titles in the life, medical, physical, and allied sciences are devoted to OHIOLink. The author notes that if OSU had not had OHIOLink, they would have paid 61.4% more to directly purchase the journals cited in this analysis which they currently obtain by portfolio purchases. However, if they purchased only those titles which the faculty in question had cited 10 or more times, the cost would be 30% more. If they purchased only the titles which had been cited 15 or more times, OSU would only have paid an 8.9% premium to buy the titles directly from the publisher rather than through OHIOLink.

Conclusion – As the author points out, her findings raise the question as to whether the large amount of content provided by buying

into the “Big Deal” portfolio purchases (as they are frequently called) is really worth it for OSU Libraries. The author notes that other articles have asserted that portfolio purchases form a significant barrier to libraries wishing to purchase individual titles, as the amount spent on portfolio purchases can limit a library’s financial flexibility. Even when other individual titles may more closely meet faculty needs, it can be difficult to justify cancelling portfolio purchases that offer a larger number of journals in the field.

The advantages and disadvantages of portfolio purchasing at Ohio State University Libraries are clear from the author’s research: while some fields are well-served by portfolio purchases, others are not, with large percentages of the journals which are most important in their fields not being available through such portfolios.

Furthermore, due to the percentage of the OSU Libraries’ budget dedicated to OHIOLink portfolio purchases, flexibility to purchase titles not in portfolios is indeed limited. The author’s pricing calculations lead to the conclusion that OSU Libraries pay between an 8.9%-30.0% premium to maintain access to 3,813 titles (75.4%) which were cited fewer than 10 times over the three year period between 2003 and 2005.

The author concludes that the premium paid to access over three-quarters of the journals available in portfolios should be reconsidered, as they are relatively infrequently used and thus may not be meeting faculty research needs. The author recommends that large research libraries (including OSU Libraries) consider a return to à la carte purchasing. Additionally, the author notes that purchase of portfolios by a large percentage of research libraries may lead to normalization of library collections and loss of the ability to support non-commercial publishers who publish strong research in specialized fields.

Commentary

The author does not explain why a journal would need to be cited specifically 10 times or more over a three year period in order to be considered a Zone 1 journal. At another point in the article, fifteen citations is suggested as a benchmark which might be used to justify the purchase of a particular title; the rationale for choosing either number is not specified.

The methods used by the author to determine pricing of individual journals within portfolios seems reasonable, but there could be variations among journal titles or between fields. This reviewer acknowledges the difficulty of determining a reasonable calculation for the pricing of an individual electronic journal within a portfolio. It is somewhat less difficult to determine the price of a print journal, and the author’s method of averaging the price discount for previous years appears reasonable, but again, there could be great variations among individual titles. It might have proven more accurate if the *Librarian’s Handbook* and *Ulrich’s Periodical Directory* for each of the years between 2003 and 2005 had been consulted, though this would undoubtedly have been more labor-intensive. These issues, however, are not sufficiently substantial as to invalidate the conclusions of the study.

The author’s conclusions will most likely be of greatest interest to large academic research libraries and library systems comparable to those of OSU. Similar analyses of the citation patterns prevalent at other large academic research institutions could be quite valuable, and it would be worthwhile to see if the numbers are as striking at other institutions. One might not expect major differences, but the types of colleges, the disciplines studied, and the research undertaken at other universities might provide interesting comparisons. It would also be interesting to undertake similar studies at small and mid-size institutions. Some libraries which are not part of large research systems but which nevertheless support a number of

graduate programs in specific fields also subscribe to Big Deal portfolios. It would be interesting to analyze citations in articles published by faculty at these institutions to determine whether their research needs are better served by the portfolios (which undoubtedly do allow libraries to purchase access to a larger number of journal titles overall), or whether they too would be better served by returning to individual title purchasing practices, at least in certain fields. The author also notes that some libraries, most notably those of Cornell University, have cancelled portfolio purchases from at least one large publisher (Elsevier) and others (such as the University of Wisconsin-Madison) have never been involved in portfolio purchasing. It would also be interesting to obtain further information on factors or studies which informed these decisions, and to compare these to the work

done by the author at Ohio State; this information might usefully inform further research by other academic libraries. In any case, libraries might be well advised to examine the benefit to their own faculty of the Big Deal portfolio purchases, and to use the information thereby gleaned to inform their own purchasing practices.

Work Cited

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