

**Assessment of Usage of Electronic Chemistry Journals by Citation Analysis to
Determine Quality of Journal Aggregation**

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Introduction

The “serials crisis,” or exorbitant and rapidly rising journal prices, especially for scientific, technical, and medical (STM) publications, has been problematic for academic libraries for several decades now and has been described at length in the literature. Librarians had hoped that migrating to e-journals would help alleviate the strain serials have put on library budgets, but they were not as inexpensive as initially hoped. Costs have continued to rise beyond the means of many libraries. Academic librarians have attempted to stretch their serials budgets by forming consortia with other libraries in order to purchase large packages, or bundles, of electronic journals from publishers and other vendors. Many have resorted to large serials cancellation projects and cuts in purchases of monographs in order to free up funds for the purchase of these bundles, which would be beyond their means if not purchased cooperatively (Nabe).

Libraries already subscribe to the print version of many of the titles included in the aggregated collections of e-journals. However, the packages made available by publishers often include numerous other titles which make little sense for the curriculum of a particular university and that seem to be of marginal interest to researchers at the university. The question is whether those “bonus” titles, or the ones for which the library has no print subscription, are being used by their presumed audience. Also, are the electronic journal packages created by some publishers less likely to include extraneous journals than other publishers? These questions will be examined through the lens of the chemistry-related electronic journals available to faculty in the University of North Carolina Chemistry Department via the UNC Libraries’ webpage and the journals they chose to cite in their publications during the period of 2002-2003.

Literature review

Pros and Cons of Bundling

Publishers began offering packages of electronic journals in the late '90s. The packages were eagerly embraced by academic libraries who were happy to give their users access to a broad array of e-journals. Some positive aspects of bundles of electronic journals include eliminating the work involved with dealing with individual titles on the part of both publisher and library and offering access to a wider range of journal titles. Patrons are often pleased by the large numbers of journals available to them. However, many of the publishers require that the library accept all of the titles in the package or not be able to buy anything at all.

Kenneth Frazier was the first to refer to the practice of consortial purchases of bundled electronic journals as the "Big Deal" in his influential 2001 *D-Lib* article in which he cautioned librarians against signing up for it. A number of other authors subsequently adopted his terminology to describe the practice in their criticisms of it. Others such as Thomas Peters have brought up questions as to whether the model of collection development in which collections are built title by title carefully considering the needs of users are no longer feasible or desirable and that perhaps another model would be more appropriate in the current environment although he offers little detail as to what that might be.

Patterns of E-Journal Usage

Studies on e-journal usage have drawn conclusions that would tend to support traditional models of collection development. Previous studies of usage of electronic journals have found similar patterns to those found for print journals. Bradford's Law

holds for electronic journals as well as print. That is, the bulk of the articles accessed or cited will be from a very small proportion of journals (Davis 2002b, 156). In a study on usage of electronic journals by a consortium, Philip Davis found that different types of institutions have different usage patterns (2000a). This is consistent with the conventional wisdom of collection developers: collections must be managed with the unique needs of your users in mind. It is difficult to do this when your institution is part of a consortium which consists of very different types of institutions as frequently occurs with geographically based consortia (Davis 2000a).

Methods of Assessment

There has been some work published on the assessment of the usage of electronic journals, both those which are freely available and those from commercial and society publishers which are not. There are different ways to assess usage of electronic resources. Two commonly used methods are citation analysis and transaction logs. Librarians have long used citation analysis to determine usage of their collections. Presumably, works that are cited in research articles are important and useful to the author. Downsides to this method are that it gives no indication of whether journals were accessed electronically and give no indication of what authors read and choose not to cite. Another method is looking at the transaction logs provided by publishers or server logs. They have the advantage of being specific to electronic journals but are problematic as well. The logs are not uniform and do not always give comparable information. For instance, some statistics may be based on the number of search sessions whereas another publisher might count the number of log-ins to their website (Bauer). This makes it difficult to compare information on journals provided by different publishers. Also, it is not clear from the

data who was logging in or initiating a session or why they were doing so (Davis 2000b, 490). Perhaps many sessions were initiated by a librarian doing research on which electronic journal titles were offered a particular publisher or trying to determine why a patron was having access problems. Neither method is perfect or gives a complete picture of what e-journals are necessary or important to patrons or patrons' usage behavior. For reasons of accessibility to information, this study will make use of citation analysis.

Methodology

Identification of "Bonus" Titles

The first step will be determining which chemistry electronic journals have been included as "bonus" titles in aggregations created by publishers. On the UNC Libraries' E-Journals webpages, there are 418 journals which appear in the subject listing for chemistry. Most of the electronic journals are part of packages from such prominent STM publishers as Elsevier, Wiley, and Kluwer. Of the the "chemistry" journals, a fair number are those for which the libraries subscribe to the print version as well as the electronic version. These have records in the OPAC in addition to being listed in the E-journals list. Those journals which are not included in the OPAC will be presumed to have been included as "bonus" titles as part of the aggregation of journals from a particular publisher. Also, journals for which our print subscription was cancelled before 1995, as indicated by its status in the OPAC, or for which there is no print subscription will be considered "bonus" titles. The year 1995 was chosen because it was before electronic journals were widely available in libraries. The electronically available journals, their publisher, whether or not the UNC Libraries currently subscribe to the print version,

whether or not the journal has a record in the OPAC will be entered into a spreadsheet, and whether it is considered by the previously stated criteria to be a “bonus” journal.

Criteria for Inclusion and Collection of Citations

This study will make use of citation analysis to examine which chemistry journals are being used by the chemistry department. Although researchers and authors from other disciplines make use of chemistry journals, the faculty, postdoctoral fellows, and graduate students in the Chemistry Department are the major users of the chemistry literature. Assessing publications of UNC Chemistry Department faculty will also include graduate students and postdoctoral fellows in the data gathered because, in chemistry, graduate students and postdoctoral fellows are generally co-authors with the faculty members with whom they work.

Given how recently many electronic journals have become available and the changing nature of what publishers include in their bundles, only works from the last two years will be examined. Lists of publications for the period of 2002-2003 for each faculty member will be compiled from listings of publications available on individual professor’s webpages. In order to ensure that the list is comprehensive, the lists will be compared against lists obtained from searches in SciFinder Scholar which indexes the Chemical Abstracts Services databases.

Lists of citations for each paper will be obtained from the Science Citation Index. The number of citations for each journal will be tallied, and the titles will be ranked in order of frequency of citing. It is expected that that pattern will be similar to that seen for other studies of usage of journals where 80% of the citations come from 20% of the journals. Once citation frequencies have been determined, the list can be compared to the

list of “bonus” journals to ascertain whether they are being used by the chemists. It might also be interesting to look at which “bonus” journals are most frequently cited.

In addition to looking at what journals are used, the number of e-journals which are considered “bonus” titles for each publisher will be tallied. The percentage of chemistry journals which are “bonus” titles for each particular publisher will be determined, and the publishers will be ordered on the basis of the percentages. The percentages will be compared to whether any of their aggregations of journals are more likely to include titles to which UNC would not have otherwise subscribed.

Project schedule

The following is a tentative schedule for my master’s paper. All dates are expected completion dates.

Project phase	Literature review	Data collection	Data analysis	Rough draft	Final draft
Expected	Monday, January 27	Monday, February 9	Monday, March 1	Monday, March 22	Monday, April 4
Worst case	Monday, February 23	Monday, March 8	Monday, March 22	Monday, March 29	Monday, April 11

Significance

Collection managers instinctively believe that the needs of their patrons are not being served when they are not allowed to make decisions about what items to acquire. Much of the literature on electronic journal packages discusses the negative aspects of the inclusion of large numbers of titles which the librarians might not have chosen. Frazier claims that these packages will “weaken... [our] collection[s] with journals we neither need nor want.” Are the reservations of collection development librarians about letting

publishers choose the contents of electronic journal packages merely territoriality and a reluctance to build collections in a different way or are the needs of users better met by offering a larger number of journals?

If the journals which are bundled with titles the librarian might have chosen really are not being used by patrons, that gives more credence to the claim that our collections are made weaker by the addition of so many titles that are of little use to our patrons. Libraries currently take great pride in the number of electronic journals to which they are able to give their users access, but is that pride merited if patrons have no use for them? Determining which, if any, of the “bonus” titles are considered to be important by the chemistry faculty will give some idea as to the usefulness of the aggregation of electronic journals from a specific publisher. The comparison of which publishers tend to include more potentially undesirable titles will give another perspective on this.

Summary

Rising costs of serials have been plaguing academic libraries for several decades, and the problem does not seem to be abating. Costs and issues involved with electronic journals are more troubling than ever to academic librarians. One issue that has caused some controversy is that of bundling where the publisher includes “bonus” titles in addition to those to which the library previously subscribed. This study aims to determine whether patrons are using the bundled titles and whether some publishers are more likely to include extraneous titles than others.

Bundles of electronic journals offer many titles to library patrons, but the lack of ability to select titles for inclusion has led to criticism of publishers. Some authors have

suggested that perhaps this is an outdated method for collection development. Some studies of electronic journal usage have indicated that it is not that dissimilar from the usage of print journals and for this reason perhaps does not merit a whole new method of collection development. Two major methods of assessing usage of electronic journals are citation analysis and transaction log data. Both have drawbacks.

The usage of chemistry-related electronic journals by the faculty of the University of North Carolina Chemistry Department will be assessed by means of citation analysis. The titles of chemistry journals which are considered to be “bonus” ones will be compiled and compared to the journals cited by chemistry faculty to ascertain which “bonus” journals, if any, are being cited.

The assessment of the usage of bundled electronic journal titles will help determine whether the concerns of critics of the “Big Deal” are merited or whether a new model of collection development for the electronic environment is in order. It will also help determine how useful particular publishers aggregations are, at least for the discipline of chemistry.

References

- Bauer, Kathleen F. "Indexes as Tools for Measuring Usage of Print and Electronic Resources." *College & Research Libraries* 62.1 (2001). *Library Literature and Information Science*. UNC Libraries, Chapel Hill, NC. 31 May 2003.
- Davis, Philip M. "Patterns in Electronic Journal Usage: Challenging the Composition of Geographic Consortia." *College & Research Libraries* 63.6 (2002a): 484-497.
- Davis Philip M. "Where to spend our E-journal money: Defining a university library's core collection through citation analysis." *Portal: Libraries and the Academy* 2.1 (2002b): 155-166.
- Frazier, Kenneth. 2001. "The Librarians' Dilemma: Contemplating the Costs of the "Big Deal'." *D-Lib Magazine* 7.3 (2001). 31 May 2003.
<<http://www.dlib.org/dlib/march01/frazier/03frazier.html>>
- Nabe, Jonathan. "E-Journal Bundling and Its Impact on Academic Libraries: Some Early Results." *Issues in Science & Technology Librarianship* 30 (2001). 31 May 2003.
<<http://www.istl.org/istl/01-spring/article3.html>>.
- Peters, T. A. "What's the big deal?" *Journal of Academic Librarianship* 27.4 (2001): 302-304.