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The concentration of journal use in Canadian universities (Paper)

Abstract

This paper presents the results of an analysis of scholarly journal usage in 22 Canadian universities, sponsored by the Canadian Research Knowledge Network (CRKN). Usage is assessed using citation data, usage data (downloads), as well as survey data. The results show a high concentration of journal usage in Canadian universities and a moderate correlation between the indicators used. We also find a significant overlap between the overall and “core” journal collections of universities.

1. Introduction

Librarians evaluate the use of their collections to inform their development and management. The goal is often to identify the core documents: those that are most useful to their users and “should definitely be included in the collection” (Nisonger, 2007, p. 52). Until the early 1990s, libraries subscribed to individual journals, but with the advent of electronic publishing, publishers started to sell journal bundles to libraries for their “then-current total expenditure on the publisher’s offerings, plus an additional 5–15%” (Bergstrom, Courant, McAfee & Williams, 2014, p. 9426). These “Big deals” allowed libraries to significantly enlarge their collections at an initially low cost, and without running into shelving space issues. Thus, the bundles removed, to a certain extent, the necessity to evaluate journal collections (Hahn, 2006, p. 4). However, the bundles are purchased through 3-5 years contracts and typically include a 6% annual price increase (Poynder, 2011) and then have to be renegotiated. Because of this fast and continuous increase of bundle prices and the libraries’ budget constraints, academic libraries are now questioning the bundles’ affordability and sustainability (Strieb & Blixrud, 2014, p. 591), and many have started to “unbundle” their journal subscriptions or, more drastically, to cancel subscriptions to all journals from large commercial publishers (Anderson, 2017).

Walking away from the “big deals” has forced libraries to evaluate the usage of their electronic journal collections. In June 2016, we began the “journal usage project”ⁱⁱ sponsored by the Canadian Research Knowledge Network (CRKN), in which we analyzed the journals use of 28 Canadian universities using three indicators: references, downloads, and mentions of the journals in a survey (conducted in 23 of the universities). This paper analyzes the journal usage data collected in 22 universitiesⁱⁱⁱ in the course of this project. Its aims are to determine the level of

concentration of journals usage at the national and at the institutional levels, to measure the correlation between the three indicators used (i.e. downloads, references, and mentions), and to measure the overlap of core journals between universities.

There is presumably a lot more to be gained for libraries in terms of collection usage knowledge and negotiation power from the evaluation of journal usage at a larger, more coordinated, scale (e.g. the national level) than from a sole library's local usage. However, not much is known of said journal usage on such a scale.

2. Data and Methods

We retrieved reference data from Web of Science articles published over the 2011–2015 by authors affiliated to at least one the participating universities. The number of downloads to each journal was retrieved from the Journal Report 1 filesⁱⁱⁱ provided by the libraries. The mentions were obtained from a survey conducted within each institution. Respondents were asked to select up to 10 journals that are essential for their research activities, and up to 10 journals that are essential for their teaching activities. An open text question allowed participants to list additional journals, or to mention journals that were not found in the provided list. We combined the three datasets in order to create a single journal list with the number of times they were cited, downloaded and mentioned as essential to members of the institution. Journals from each list were matched with one another using the ISSN when available, and journals left unmatched were matched using the titles. Journals that have numerous topical series are often grouped under a single ISSN and were thus considered as one unique journal. In cases where journals changed their name, the different titles were grouped together and considered a unique journal.

We limited our list to academic/scholarly journals using Ulrich's Periodical Directory. If a journal was not found on Ulrich, we searched the web for information. When no information was found, we considered the journal as nonacademic. We then divided the academic journals in four disciplines: Arts and Humanities (AH), Social Sciences (SS), Biomedical Sciences (BM), and Natural Sciences and Engineering (NSE), using information from Ulrich's Periodical Directory and other sources such as the journals' websites. The resulting list contains 46,986 journals: 7,007, 10,442, 12,998, and 16,539 in AH, BM, NSE and SS respectively.

As journal use is heavily skewed (Bradford, 1934), we compiled for each institution, indicator, and discipline, the cumulative distribution of usage, and identified as "core journals" those that collectively account for 80% of downloads, 80% of mentions, or 80% of references.

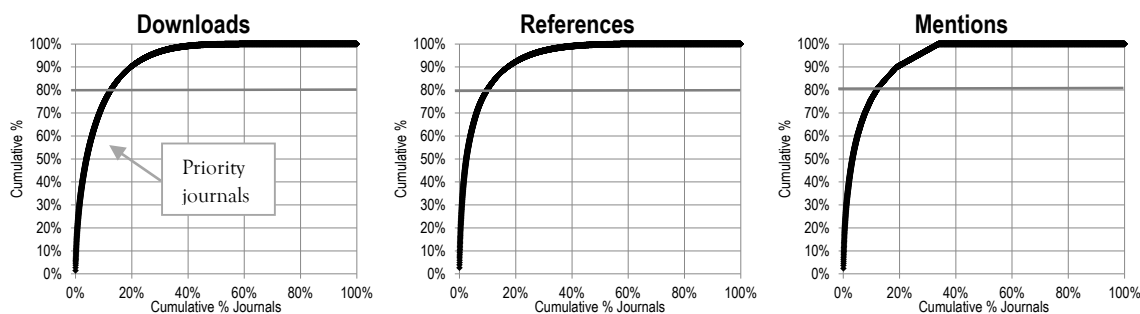


Figure 2. Example of the cumulative distribution of downloads, references and mentions.

It is worth noting that larger universities have higher thresholds in terms of both number of downloads and number of references. Also, because of the limited number of respondents to the survey in each institution (ranging from 29 to 529), one mention is generally sufficient for a journal to be considered core for most disciplines and institutions.

3. Results

Table 1 describes the proportion of core journals according to each indicator by discipline. It shows that both at the national and individual institution levels, the average proportion of journals accounting for 80% of the total usage is very low. It also shows that, overall, the core journals are more concentrated for the references indicator than for the other two. At the institutional level, we observe that the proportion of core journal ranges from 0.4% in BM for mentions, and 25.5% in AH for downloads, and that a higher proportion of journals are identified as core journals by the downloads indicators than by the other two. We also see that overall, the level of concentration of journal usage varies between disciplines and indicators. For example, usage is the most concentrated in BM according to mentions and the least concentrated according to references. Similarly, usage is the most concentrated in AH according to references and the least concentrated according to mentions.

Table 1. Proportion of core journals according to each indicator by discipline

| | | National level (%) | Institutional level | | | |
|------------|-----|--------------------|---------------------|--------|----------|----------|
| | | | Avg. (%) | SD (%) | Min. (%) | Max. (%) |
| Downloads | AH | 9.6 | 17.4 | 4.4 | 11.0 | 25.5 |
| | BM | 9.6 | 12.5 | 2.1 | 8.3 | 18.3 |
| | NSE | 6.8 | 9.3 | 1.7 | 6.5 | 14.1 |
| | SS | 10.8 | 15.7 | 2.5 | 12.0 | 20.2 |
| | All | 9.3 | 13.3 | 1.9 | 10.5 | 17.8 |
| References | AH | 3.0 | 4.0 | 1.8 | 0.5 | 8.5 |
| | BM | 7.3 | 8.6 | 2.3 | 3.7 | 12.8 |
| | NSE | 4.9 | 5.6 | 1.7 | 2.1 | 9.0 |
| | SS | 3.5 | 4.9 | 1.7 | 1.8 | 8.7 |
| | All | 4.7 | 5.9 | 1.7 | 2.4 | 9.4 |
| Mentions | AH | 9.1 | 7.9 | 5.1 | 1.4 | 21.4 |
| | BM | 7.5 | 4.1 | 2.5 | 0.4 | 9.9 |
| | NSE | 8.8 | 5.8 | 2.8 | 1.3 | 10.8 |
| | SS | 9.0 | 7.1 | 3.5 | 1.6 | 13.3 |
| | All | 8.7 | 5.9 | 2.8 | 1.2 | 11.0 |

Table 2 describes the correlation between all indicators at the national and institutional level. It shows moderate correlation between all indicators, it being slightly higher for combined institutions than individual ones.

Table 2. Correlation between the three indicators for all universities combined and individually.

| | | National level | | Institutional level | | | | | | | |
|-----|------------|----------------|------------|---------------------|------|-------|------|------------|------|-------|------|
| | | Downloads | References | Downloads | | | | References | | | |
| | | | | Avg. | SD | Min. | Max. | Avg. | SD | Min. | Max. |
| AH | References | .592* | – | .320 | .085 | .130 | .460 | – | – | – | – |
| | Mentions | .576* | .498* | .287 | .106 | .047 | .434 | .212 | .134 | -.115 | .390 |
| BM | References | .821* | – | .648 | .159 | .208 | .812 | – | – | – | – |
| | Mentions | .579* | .604* | .299 | .181 | -.186 | .551 | .353 | .187 | -.082 | .728 |
| NSE | References | .787* | – | .658 | .139 | .241 | .772 | – | – | – | – |
| | Mentions | .610* | .662* | .387 | .079 | .203 | .513 | .389 | .108 | .002 | .526 |
| SS | References | .666* | – | .533 | .093 | .241 | .651 | – | – | – | – |
| | Mentions | .563* | .489* | .297 | .120 | -.035 | .579 | .260 | .124 | -.044 | .522 |
| All | References | .656* | – | .553 | .111 | .242 | .681 | – | – | – | – |
| | Mentions | .562* | .387* | .319 | .066 | .166 | .455 | .232 | .094 | -.020 | .377 |

Note: * p < 0.01. Values are Spearman's rank correlation coefficient.

Table 3 describes the overlap between institutions' journals list and core journals list. It shows that for all disciplines, about 60% or more of journals composing the institutions' collections are the same for all disciplines, the minimum overlap being 19.5% in AH and the maximum being over 80% for every discipline. The core journals overlap is approximately 40% for all disciplines, with a minimum value of 18.9% in NSE and a maximum of 66.6% in BM.

Table 3. Overlap between institutions' journals list and core journals list.

| Discipline | Journals overlap | | | | Core journals overlap | | | |
|------------|------------------|--------|----------|----------|-----------------------|--------|----------|----------|
| | Avg. (%) | SD (%) | Min. (%) | Max. (%) | Avg. (%) | SD (%) | Min. (%) | Max. (%) |
| AH | 59.7 | 11.9 | 19.5 | 83.3 | 41.6 | 7.0 | 19.8 | 58.5 |
| BM | 69.5 | 6.4 | 50.2 | 84.7 | 45.2 | 8.3 | 23.6 | 66.6 |
| NSE | 69.5 | 5.2 | 52.5 | 82.6 | 37.8 | 7.1 | 18.9 | 56.0 |
| SS | 64.8 | 9.8 | 36.1 | 83.8 | 43.7 | 5.1 | 27.8 | 57.9 |
| All | 66.6 | 7.3 | 42.6 | 82.2 | 42.4 | 5.3 | 25.2 | 58.4 |

4. Discussion and Conclusion

Even though Canadian university libraries have access to a great number of scholarly journals through the big deals, only a small fraction of those journals – the core collection – is being used. This high usage concentration is, more often than not, much smaller than the expected 20% according to Bradford (1934). The moderate correlation found between the three indicators highlights the importance of using multiple indicators, and the relevance of the indicator chosen, to evaluate journal usage: references, downloads and mentions are complementary measures of journal usage and are thus arguably necessary in order to fully capture the institutional communities' need for specific journals. Finally, our results show the journal collections of Canadian university libraries greatly overlap (66.6% overlap on average). The overlap is smaller when considering core journals only, but remains quite high at 42.4% on average.

Given the usage concentration and collection overlap at the national level demonstrated in the present study, our findings are in line with the idea advocated by Atkinson that university libraries have a lot to gain from greater cooperation when it comes to collection management and development (2006, p. 249). By joining forces, libraries could at the same time reduce their financial burden, increase their negotiation power against commercial publishers, and enhance their ability to meet the needs of their communities.

Notes

ⁱ <https://www.crkn-rcdr.ca/en/journal-usage-project>.

ⁱⁱ Five universities did not conduct the survey and are thus not included in this analysis. One university was not included because their download data were not yet available at the time of the present analysis.

ⁱⁱⁱ The journal report 1 files contain the number of successful full-text article requests by month and journal. For more details, see: (<https://www.projectcounter.org/code-of-practice-sections/usage-reports/>).

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