Qualitative and Quantitative Methods in Libraries (QQML) 6:13-21, 2017

The future of impact metric use among collection development librarians

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Abstract: Collection development librarians often use metrics such as usage statistics, citation counts, and journal impact factors to inform their collection management decisions. How might newer metrics like altmetrics (data sourced from the social web that exposes how research is discussed, shared, bookmarked, and reused) complement those already in use? In this paper, the authors discuss the results of a nationwide survey of US academic librarians working at R1 institutions that sought to understand the extent to which librarians use altmetrics in the course of their daily work. In particular, we examine collection development librarians' awareness of altmetrics and other impact metrics; how often collection development librarians are using altmetrics to make decisions regarding their collections; and whether the disciplines with which collection development librarians liaise have an effect on librarians' awareness of altmetrics. The survey results are then discussed in the context of the challenges and opportunities that exist for the use of altmetrics in the future of library collection development practices.

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Keywords: altmetrics, bibliometrics, collection development, disciplinarity

1. Introduction

The use of quantitative data to understand and communicate the value of academic library services is an increasingly popular topic, especially in an era of increased requirements to prove "return on investment" for library budgets. In this paper, the authors seek to understand the extent to which a new class of metrics called "altmetrics" is being used to inform collection development practices in the United States.

Most libraries currently collect usage statistics and citation-based metrics to evaluate their collections and services (Showers, 2015). However, these two types of metrics are not the only quantitative means of research assessment

Received: 18.1.2017 Accepted: 20.2.2017 ISSN 2241-1925

available: altmetrics are emerging as another option, one that can fill in the gaps that citation-based metrics and usage statistics leave behind.

Hoffmann & Doucette (2012) performed a meta-analysis of citation analysis studies that have informed collection development. Popular citation analysis methods include a review of the types of resources cited, the frequency of citations to journal titles, the journal impact factor of cited journals, publishers of citations journals, and cost per citation (Hoffmann & Doucette, 2012).

Simple citations counts are a metric by which it is possible to judge the influence of a particular article or book. These are metrics sourced from a variety of platforms (Web of Science, Scopus, Google Scholar, ResearchGate, etc) that index how often a book or article is formally cited by other research on that platform.

In addition to citation analyses, there are a number of simpler methods by which collection development decisions can be made using citation-based metrics.

The journal impact factor (JIF) is a tool frequently identified as being used to make purchasing decisions in libraries (Cameron, 2005; Lorbeer, 2012). The SCImago Journal Rank has also been proposed by librarians as a discipline-sensitive citation-based metric by which to judge the impact of a journal when making collection development decisions (Moisil, 2015; Ugaz, 2011).

Altmetrics are data sourced from the social web that describes how research is shared, discussed, saved, and used online. Altmetrics can be sourced from many places, including research blogs (Shema, Bar-Ilan, & Thelwall, 2015), Faculty of 1000 Prime (Li & Thelwall, 2012), Twitter (Priem & Costello, 2010), and policy documents (Konkiel, 2015). They can indicate "flavors of impact" (i.e. a variety of uses) among diverse stakeholders (Piwowar, 2012), making them a complement to citation-based metrics, especially for understanding public and non-traditional scholarly uses of library-hosted content.

At the journal level, it has been suggested that altmetrics including social bookmarks from sites like CiteULike (Haustein & Siebenlist, 2011) and aggregated altmetrics indicators like the Altmetric score (Loach & Evans, 2015) could be used to evaluate the usage and perception of titles. At the article level, it is possible to understand who is using science articles and for what purposes, using Faculty of 1000 and Mendeley (Bornmann & Haunschild, 2015), Twitter (Haustein et al., 2012), Facebook (Ringelhan, Wollersheim, & Welpe, 2015), and research blogs (Shema et al., 2015).

In the humanities, evaluation of books using GoodReads (Ann, Zuccala, Verleysen, Cornacchia, & Engels, 2015), mentions in syllabi (Kousha & Thelwall, 2015b), and Choice reviews (Kousha & Thelwall, 2015a) have been suggested.

To date, several articles that have claimed that altmetrics could in theory be used to make collection development decisions (Galligan & Dyas-Correia, 2013; Michalek & Buschman, 2014; Sutton, 2014), but no data currently exists on whether altmetrics are actually in use for that purpose.

2. Methodology

The purpose of this study was to assess academic librarians' current awareness of and usage of research metrics (e.g. journal impact factors, article citation counts, and emerging forms of metrics such as altmetrics) in the course of their work.

In order to accomplish these purposes, full-time, academic librarians in Carnegie classified RU/VH (Research Universities with very high research activity) academic institutions in the U.S. were surveyed using a survey instrument developed specifically for this study. Potential participants were identified using publically available staff directories found on the web pages of academic libraries serving RU/VH institutions. The pool of potential participants numbered 13,436.

Invitations to the final version of the survey were sent via email in August 2015 to all 13,436 potential participants using the Qualtrics survey tool. The survey received a total of 707 responses, which represents a 5.3% response rate.

Initial descriptive statistics were produced using Qualtrics and then exported in formats compatible with both Excel software and SPSS. Survey questions related to the participant's level of familiarity with various metrics were expressed in terms of a Likert scale ranging from "I know nothing" to "I'm an expert" on the metric in question. Survey questions related to the participant's regular (occurring once per month or more often) and occasional (at least once per year and less than once per month) job responsibilities were also asked.

Data obtained from both types of questions is categorical, some of it ordinal rather than continuous. Thus we chose non-parametric tests for our analyses. When our data met the appropriate assumptions, we used a point-biserial test to identify the correlations (for example, having regular collection development responsibilities and a high level of familiarity with altmetrics). When our data did not meet the assumptions required for the point-biserial correlation, we used chi-square tests of independence to identify differences between groups of librarians on their levels of familiarity with altmetrics. The results of our analyses follow in the next section.

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3. Results

Awareness of metrics. Of the 707 total respondents to the survey, 395 (55.9%) indicated that they had regular (299, 75.7%) or occasional (96, 24.3%)

collection development responsibilities. We asked this group to rate their familiarity with the Journal Impact Factor (JIF) on a scale of 1 (I know nothing) to 5 (I'm an expert). Just more than 47% chose 4, indicating high familiarity but not expert familiarity with JIF. Only 14.17% indicated that they were experts on JIF, while the rest reported lower levels of familiarity (Figure 1).

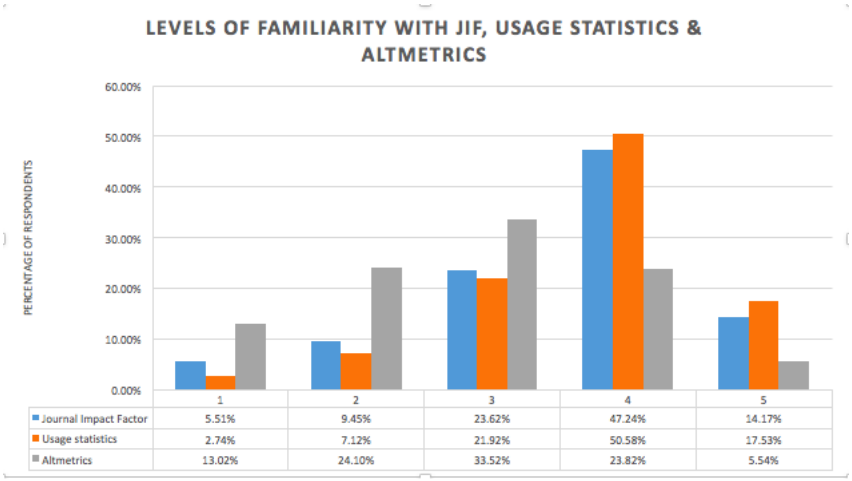


Figure 1. Collection development librarians' familiarity with Journal Impact Factor, usage statistics and altmetrics

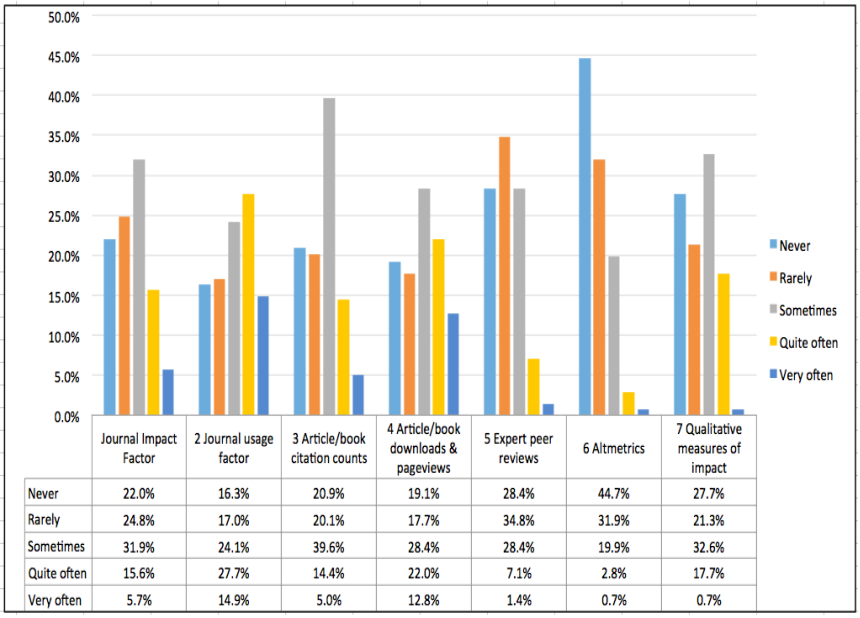
We also asked librarians with collection development responsibilities to rate on the same scale their familiarity with the usage counts. Just more than 50% chose 4, indicating high familiarity but not expert familiarity with usage counts. Only 17.53% indicated that they were experts on usage counts, while the rest reported lower levels of familiarity (Figure 1).

Finally, we asked librarians with collection development responsibilities to rate their familiarity with the altmetrics on a scale of 1 (I know nothing) to 5 (I'm an expert). Just over 33% chose 3, indicating only moderate familiarity with altmetrics. Only 23.82% indicated higher than moderate familiarity with altmetrics and only 5.54% indicated that they were experts on altmetrics. Twenty-four percent felt very little familiarity with altmetrics, and 13% had never heard of them (Figure 1).

Our respondents' familiarity with JIF, usage counts, and citation counts were quite similar, so similar in fact as to have no statistically significant differences. There is, however, a significant difference between librarians' familiarity with altmetrics and their familiarity with JIF, usage counts, and citation counts χ^2 (4, n = 388) = 84.004, p < 0.00), χ^2 (4, n = 388) = 124.505, p < 0.00 and , χ^2 (4, n = 388) = 147.886, p < 0.00 respectively. From this it would appear that the

librarians who participated in our survey are less familiar with altmetrics as a measure of research impact than they are with more traditional measures of research impact. Because our data did not allow for testing the representativeness of our sample of librarians to the larger population, these results should not be generalized to the larger population.

Metrics for collection development. We asked survey participants how often they evaluate materials using the following indicators of research impact (JIF, journal usage, article/book citation counts, article/book downloads & pageviews, expert post-publication peer reviews (e.g. Faculty of 1000, Publons, resource reviews published in library journals), altmetrics, and qualitative measures of impact (e.g. who is saying what about a research article or book)) in the context of collection development duties? Figure 2 describes their responses.



	Journal Impact Factor	2 Journal usage factor	3 Article/book citation counts	4 Article/book downloads & pageviews	5 Expert peer reviews	6 Altmetrics	7 Qualitative measures of impact
Never	22.0%	16.3%	20.9%	19.1%	28.4%	44.7%	27.7%
Rarely	24.8%	17.0%	20.1%	17.7%	34.8%	31.9%	21.3%
Sometimes	31.9%	24.1%	39.6%	28.4%	28.4%	19.9%	32.6%
Quite often	15.6%	27.7%	14.4%	22.0%	7.1%	2.8%	17.7%
Very often	5.7%	14.9%	5.0%	12.8%	1.4%	0.7%	0.7%

Figure 2. Frequency of metrics use for collection development.

Overall, the librarians who responded to our survey most frequently used usage counts and download and pageview counts often or very often in the conduct of their collection development responsibilities. "Sometimes" was the most frequent response to the question how often do you use citation counts and JIF. Finally, the librarians who responded to our survey most frequently replied that they rarely or never used altmetrics, expert peer reviews, and qualitative measures of research impact.

The largest proportions of respondents to our survey with collection development responsibilities (76.6%) rarely or never use altmetrics in the context of their collection development duties. More than half of them (63.1%) also rarely or never use expert peer review in the context of their collection development duties. Almost half of them (48.9%) rarely or never use qualitative measures of impact (e.g. who is saying what about a research article or book). As is illustrated in Figure 2, only 3.5% use altmetrics often or very often in the course of their collection development responsibilities and only 8.5% use expert peer reviews often or very often, far less than they use any of the other metrics. Nearly 43% of them often or very often use JIF in the context of their collection development duties, while 34.8% often or very often use article or book download counts and 21.3% often or very often use JIF. In fact, it appears that the librarians in our survey use all impact metrics at least sometimes; for every metric we asked about except expert peer reviews and altmetrics, more respondents indicated that they were used sometimes than either never or rarely or often or very often.

There is a statistically significant difference between surveyed librarians' use of altmetrics and use of post-publication peer reviews in comparison to their use of all of the other metrics. This confirms the assumption that collection development librarians seldom include altmetrics or post-publication peer reviews in the course of making collection decisions.

There was also a significant difference between librarians' use of JIF and their use of usage counts, χ^2 (4, N=201) = 10.739, although the effect size is quite small (V=0.231). Thirty-two percent of the librarians responding to our survey sometimes used usage counts in the course of collection development responsibilities, 46.8% used them rarely or never, and only 21.3% used them often or very often. Thus it seems clear that the librarians with collection development responsibilities responding to our survey, in general, make greater use of usage statistics than they do of JIF in the course of their collection development responsibilities.

Disciplinarity and familiarity with metrics. In order to look for differences among disciplines, we categorized the disciplines respondents mentioned into four major categories: sciences, social sciences, humanities, and professions. The latter, professions, included disciplines that resulted in graduating professionals in areas like education and library science. Many of the respondents had liaison responsibilities in more than one academic discipline. Thirty-three percent of the respondents with liaison responsibilities liaised to disciplines in the sciences (e.g. biology, chemistry, and physics), 31% liaised with disciplines in the humanities, 20% liaised with professional disciplines, and 16% liaised with disciplines in the social sciences.

Journal Impact Factor. The data allowed for the identification of several significant differences between librarians with different liaison disciplines on

their familiarity with research impact metrics. There is a significant difference between liaison librarians serving the professions and sciences on familiarity with JIF, χ^2 (4, N=199) = 12.752, p=0.13. It appears that the librarians responding to our survey who have liaison responsibilities in professional disciplines are less familiar with JIF as a measure of research impact than are their counterparts with liaison responsibilities in disciplines in the sciences.

Citation counts. There is also a significant difference between humanities and social sciences on familiarity with citation counts, χ^2 (3, N=201) = 12.131, p=.007. It appears that the librarians responding to our survey who have liaison responsibilities in the humanities are less familiar with citation counts as a measure of research impact than are their counterparts in the social sciences.

Usage statistics. There is a significant difference between professions and social sciences on familiarity with usage statistics, χ^2 (3, N=199) = 11.242, p=.010. There is also a significant difference between professions and sciences on familiarity with usage stats, χ^2 (3, N=199) = 22.428, p=.000. It appears that the librarians responding to our survey who have liaison responsibilities in professional disciplines are less familiar with usage statistics as a measure of research impact than are their counterparts with liaison responsibilities in disciplines in the sciences and the social sciences.

Altmetrics. There is a significant difference between sciences and social sciences on familiarity with altmetrics, χ^2 (4, N=200) = 31.228, p=.000. It appears that the librarians responding to our survey who have liaison responsibilities in the social sciences are less familiar with altmetrics as a measure of research impact than are their counterparts with liaison responsibilities in disciplines in the sciences.

There is a significant difference between professions and sciences on familiarity with altmetrics, $\chi2$ (4, N=200) = 25.712, p=000 and between professions and social sciences, $\chi2$ (3, N=195) = 61.661, p=0.00. Finally, there is a significant difference between sciences and social sciences on familiarity with altmetrics, $\chi2$ (4, N=200) = 31.228, p=.000. It appears that the librarians responding to our survey who have liaison responsibilities in disciplines in the sciences are more familiar with altmetrics as a measure of research impact than are their counterparts with liaison responsibilities in professional disciplines and the social sciences.

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4. Conclusions

Our study confirms that altmetrics are being used by librarians to make collection development decisions. However, the numbers are currently very small. Future surveys may be able to track over time the growth of the use of

altmetrics and other types of emerging research impact data to make collection development decisions.

Moreover, raising awareness of altmetrics among librarians who serve the social sciences and professional disciplines is an area in which altmetrics advocates within libraries could have a major impact. Science librarians, who tend to have greater levels of awareness than their peers in other disciplines, could be a useful resource for such educational programs.

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Acknowledgements

The authors wish to thank Natalia Madjarevic of Altmetric for her willingness to present upon this paper in person at QQML 2016.

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