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Embedding Librarians into the STEM Publication Process

Anne Rauh and Linda Galloway

Introduction

Scientists and librarians both recognize the importance of peer-reviewed scholarly literature to increase knowledge and improve understanding of the world. Scientists’ contributions to their field are reflected in these publications and are important, not only for the greater good, but for peer recognition, promotion, and tenure. Librarians strive to provide access to, and communicate the importance of, this literature. Bridging the gap between information producers and consumers, librarians can assist STEM faculty at various stages of the scholarly publication process. Librarians can assist by helping to organize a literature review, providing publishing advice, and finally by promoting publications and assessing the impact of scholarly communication. While this mediation may require some to step outside of their comfort zone, it is important to remember that librarians already have the skills necessary to help. They know how to find, organize, and disseminate relevant information. Applying these skills to the STEM publication process can be very rewarding, both personally and professionally. In doing so, librarians will gain a better understanding of faculty and institutional research, the scholarly publication process, and learn how to increase scholars’ visibility. In addition, they will learn new tools, acquire new skills, and enhance their Library’s service to the institution.

This chapter highlights techniques the authors have used to assist STEM faculty at various stages of the publication process. We will discuss ways in which librarians can help faculty to organize a literature review and target a journal for publication and the

best practices for doing both. For the post-publication stages, we outline the variety of ways librarians can help increase and enhance access to a scholarly works using both free and institutional resources. This chapter will also address methods for assessing impact of a work using both traditional and emerging scholarly metrics. Using the resources and tools described in this chapter, librarians can actively participate in the STEM publication process.

Organizing a Literature Review

When researchers consider writing and publishing an article, one of the first steps that they take is to perform a literature review. Ideally, keeping up with the literature of one’s field is something that scholars do on a regular basis, but doing a systematic review of literature is important before publishing new work. Efficiently and effectively organizing the search results are tasks that researchers at all levels may struggle with and this task of organizing literature is a natural place for researchers and librarians to collaborate. The authors have found that researchers are typically eager to receive support in this capacity.

There are a number of tools that allow researchers to collect, organize, and cite literature, websites, images, graphs, tables, and charts within their writing. Many of these tools are supported in academic libraries throughout the country. Merinda Kaye Hensley , Associate Reference Librarian and Associate Professor of Library Administration at University of Illinois at Urbana-Champaign, provides an overview of the features offered by these tools. She describes how the access models to these tools affect libraries’ support of these resources (Hensley 2011). For a more detailed comparison of the

features of these tools, visit the University of Wisconsin-Madison Libraries’ citation manager comparison (University of Wisconsin-Madison Libraries 2012).

Syracuse University Library supports five citation management tools including EndNote, EndNote Web, RefWorks, Zotero, and Mendeley. All of these tools assist researchers in organizing scholarly literature. The tools are accessed in a variety of ways, which range from desktop applications to browser extensions. Some of these tools are freely available, some are paid for by institutional subscriptions, and others are paid for by individual researchers or through their laboratory technology funds. Regardless of how they are accessed and paid for, all of the tools allow researchers to download citation information from literature databases, electronic journals, library catalogs, and websites into their own personal research library. Once they have collected that information, they organize it into folders, assign keywords or tags to the citation information, and attach full text documents of the literature for easy retrieval. All of the tools also allow researchers to automatically create fully formatted citation in manuscripts with varying degrees of customization.

While these tools work differently from one another, they all allow researchers to collect, organize, and cite scholarly information. Peforming a literature review is an imporatant step in the scientific research and writing process and is a natural opportunity for librarians to share their expertise.

Targeting a Journal

Scholarly communication via academic journals remains the most widely accepted method of disseminating STEM information. The peer review process, required

by academic journal publishers, provides a measure of authority and quality control to reported research findings. The acceptance of a manuscript by a respected journal indicates that the authors’ work is valuable and verifiable. Helping authors decide where to publish requires basic knowledge of the publishing process, the ability to assess journal prestige and an understanding of authors’ motivations. While newer faculty most often request assistance, authors publishing outside of their usual venues may also seek guidance. Decisions about where to publish are dependent on scholars’ particular field, their motivations, and the quality of their research and writing. For example, the impact factor (IF) of a journal is considered a good measure of scientific quality. While it may be desirable to publish in a journal with a high IF, the rejection rates for articles may be very high, or the journal may not be suited to certain types of documents. It is at this junction, of author and potential publisher, where librarians can help.

It is not unusual for an author to consult a librarian for help deciding where to submit an article. Presumably, a librarian is familiar with and has the tools and knowledge to evaluate journals within a discipline. Before suggesting journals for an author to target, it is important to gain an understanding of the type of work to be published, its intended audience, and the author’s publication goals. Librarians should ask authors about their goals for the publication. Does the author want the work viewed by as many readers as possible even if the readers are not in same field of study? Does the author want to publish their work in a special issue of a journal where all of the work will be on a similar topic? Does the author have a specific group of journals that they must target for promotion? Does the author want to retain rights to the work once it is published? The importance of discipline-specific knowledge and understanding the

publishing landscape in a particular field cannot be underestimated. In addition to conferring with the librarian, the author should consult other practitioners in their field for publication advice. Furthermore, a faculty member on the tenure track may need to consider time factors that a seasoned author does not. Institutional knowledge and conversations with the author should help the librarian understand how best to assist in the publication process.

There are a number of tools to help gauge the impact and authority of a publication. The factors that are most often considered are the journal’s importance and how quickly and frequently an article is cited after publication. The most well-known suite of journal and article impact metrics is Thomson Reuters Journal Citation Reports. Of the various tools and metrics JCR provides, arguably the most useful are the journal impact factor (IF) and the Immediacy Index. The IF measures the average number of times articles from the journal published in the past two years have been cited. The Immediacy Index is the average number of times an article is cited in the year it is published (Thomson Reuters 2012).

A freely available alternative to JCR is SCImago Journal Rank (SJR indicator). The SJR indicator is populated with information from Elsevier’s Scopus database and the ranking algorithm is based upon Google PageRank (González-Pereira, Guerrero-Bote, and Moya-Anegón 2010). The SJR indicator attempts to compute both the quality and quantity of citations received by a publication. The SJR indicator and Thomson Reuters’ Impact Factor were found to correlate well when compared (Elkins et al. 2010). SCImago also provides a type of immediacy index – the average citation per document in a two

year period. In addition, SCImago includes country scientific indicators which “can be used to assess and analyze scientific domains” (SCImago Lab 2012).

Librarians should also point faculty to open access (OA) journals and self-archiving resources in their conversations about publishing venues. Major funding agencies, such as the National Institute of Health, require open access publishing in either open access journals or institutional repositories, and dissemination through open access channels can help increase readership and visibility. A recent large scale study of citation patterns revealed that OA journals indexed in either Scopus or Web of Science are approaching the scientific impact of subscription journals. The data supporting these conclusions were discipline dependent and also dependent on the OA journal funding model (Björk and Solomon 2012) so no broad conclusions should be drawn. However, increasing exposure to one’s scholarship is desired and may prove to be more important as the scientific community begins to embrace alternative metrics used to evaluate impact.

Promoting Researcher’s Work

Librarians can assist with the scientific publishing process by promoting scholars’ work after it has been published. Promoting the monographic work of scholars is something many librarians embrace and are familiar with. Librarians suggest books for purchase to colleagues at other universities, consult with authors in deciding where to solicit book reviews, and help authors determine the number of libraries that have purchased their titles. Promoting scientific journal literature is not inherently different

from these practices, though the tools authors have available to promote their work do differ.

One tool that librarians at Syracuse University use for promoting faculty work, especially publications in journals, is the institutional repository, SUrface. The goal of the repository is to archive the scholarly work of the university and make it globally accessible. While the widespread distribution of this work for free is at odds with the copyright policies of some journals, many publishers allow a post-print (the revised manuscript version of the work accepted by the publisher) of the scholar’s work to be archived rather than the publisher’s PDF version. Librarians can use the alert services of library databases to receive notification of new publications from university-affiliated authors. They can then use tools such as SHERPA/RoMEO, a searchable database of publisher archiving policies, to determine if and how an article can be archived. Adding scholarly works to the institutional repository allows researchers around the world to access articles published in journals to which they may not subscribe.

Google Scholar Citations is another way to collect and promote a scholar’s work and is a viable alternative for authors who do not have access to an institutional repository. This tool creates a profile based on searches in Google Scholar for works attributable to the author, displaying the citations along with information about the work. Several citation metrics are also shown on the author’s profile including citations per article and historical citation information about the author’s body of work. Authors verify that the work is their own and are given the option to manually enter citations not found by Google Scholar. This is an effective tool for promoting one’s work because it is easily

found in Google searches and it offers a venue for authors to display all of their work in one location.

A powerful new tool that is designed to disambiguate author names is ORCID (Open Researcher and Contributor ID). This initiative assigns an alphanumeric code to each researcher and is used to provide every author with a unique identifier. Currently, many journals only list last names and first initials in the author fields. Researchers with common names or those whose names have changed during their professional career are also hard to distinguish. ORCID is a system that assigns an author’s unique number to each work rather than relying matching names to locate all of an author’s work. This identifier has been adopted by numerous publishers “including Thomson Reuters, Nature Publishing Group, Elsevier, ProQuest, Springer, CrossRef, the British Library and the Wellcome Trust” (ORCID Inc. 2012) which will allow for consistent use throughout literature databases, libraries, and funding agencies.

Assessing Impact

On its surface, assessing the impact of an individual’s publication record seems like it should be very straightforward: simply calculate the number of citations articles receive in peer-reviewed journals. This should be an objective and unbiased exercise. However, citation metrics are not consistent across platforms, are often available only via subscription resources and also take a long time to accumulate. In general, traditional citation metrics evaluate an article’s influence only on a specific scientific community

How does one measure a scholar’s impact? Traditional tools, like Web of Science and Scopus, calculate author influence by measuring several factors including times

cited, indices such as the h-index, and journal impact factors (described earlier in this chapter). The times cited count is perhaps the most recognized measure and determines the number of citations to an author’s publications, generally in a specific time frame. Librarians, who understand how citations are generated and counted, can help faculty calculate these important metrics. It is crucial to stress that comparisons across tools should be avoided due to the different pools of data mined, proprietary ways in which publications are included (or excluded) and the various time parameters used.

A well regarded bibliometric parameter, the h-index attempts to measure both productivity and impact of an author. Described in Hirsch’s seminal work (Hirsch 2005) the h-index is simply the number of a scholar’s papers, h, that have been cited at least h times by other publications. The h-index is calculated by many citation metric tools including Web of Science, Scopus, and Google Scholar and is considered a good measure of scholarly impact.

Both Web of Science and Scopus are selective, scholarly citation databases that include information from highly regarded journals. Google Scholar is freely available and includes more types of publications than the two databases previously mentioned. More information about these databases may be found in the authors’ online guide that details the procedures and metrics used to calculate publication influence.

Attempting to gauge impact beyond citation counts, altmetrics, is an emerging field that “focuses more narrowly on scholarly influence as measured in online *tools and environments*” (Priem, Groth, and Taraborelli 2012). Altmetrics can complement existing citation metric tools, uncovering the impact and reach of research in new media for evidence of connections and influence that are not represented in the traditional modes.

For example, a measure of a paper’s influence might include the number of times this paper has been saved in a Mendeley library or the number of times it has been downloaded from an institutional repository. While these numbers do not represent tangible citations to these works, they may more effectively capture the influence that a work wields. There are many emerging altmetrics web sites, tools and programs, some of which will certainly prove to be more useful than others.

Assisting STEM faculty in the publication process requires an awareness of the various tools and resources that can be used to assess the impact of an author or an article. The established tools, such as Scopus and Web of Science, can be complemented by the existing and emerging altmetric tools. If one does not have access to the paid subscription resources, these alternative metrics may also be used to provide a demonstrated measure of academic success.

Conclusion

This is an important time for librarians to be involved in both the organization of research as well as how that research can be promoted and measured. Many academic libraries are expanding their services to include assistance to researchers in organizing and storing their research data. While helping authors to organize their literature is not as challenging as working with large data sets, helping researchers at this phase of their work is a natural starting place for libraries that are interested in becoming involved in data management. Scientific researchers understand our expertise with literature. By becoming involved in the steps of the publishing process in which we offer unique

expertise and support, we can demonstrate our value and gain trust in our capacity to understand and meet their data management needs in the future.

This is also a very important time for librarians to become involved in conversations taking place on new metrics and ways of assessing scholarly works. As metrics are refined to extend beyond traditional journal publication, and take into account new modes of scholarly communication, librarians need to share their expertise in this area and take part in these conversations. Engaging with the traditional tools and metrics that we have outlined will help you to understand their strengths and weaknesses to better suggest improvements for these new metrics.

In conclusion, the authors believe that all librarians have the necessary skills to embed themselves into the scientific publishing process. The ability to organize information and assess credible sources are skills that all librarians possess. The activities that librarians perform in our library may be slightly different from ways that you have previously applied these skills but all librarians have the skills and ability to successfully assist in the STEM publication process.

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