An evaluation of library and information science journals: A combined approach using objective and subjective measures

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INTRODUCTION

In all libraries, collection evaluation is a necessary activity. Evaluating a library's holdings provides valuable information about the strengths and weaknesses of its collection, identifies areas for further development, and helps in assessing whether or not patrons' needs are being met. For several reasons, it is especially important to evaluate journals. As journal prices increase, librarians are sometimes forced to cancel existing subscriptions to specific titles. Additionally, space constraints may require that certain titles be moved to storage locations. These issues are compounded by the fact that new, potentially valuable, journals are being published that may warrant adding titles to the collection. Without quality measures, these tasks would be nearly insurmountable for the collection manager. Also, as detailed by Johnson, "information collected through collection analysis can be used in the planning process, including justifications for budget requests and funding" as well as "accreditation and planning for new degree programs." [1] Gathering data about the quality of journals can help librarians make informed decisions about the collection.

Another important use for this evaluative data is the promotion and tenure process in higher education. Faculty members and librarians must publish scholarly, field-specific works in order to be considered for promotion. As Nisonger relates, "impact factors of the journals in

[1] Peggy Johnson, *Fundamentals of Collection Development and Management* (Chicago: American Library Association, 2004), 272-273.

which a faculty member has published are considered in both promotion and tenure decisions and annual performance reviews." [2] The promotion/tenure committee is able to make more informed decisions based, in part, upon the quality of the journals in which the faculty member or librarian has published. Also, journal ranking data can assist the faculty member in deciding which journals to submit articles for publication in order to draw the greatest career benefits.

In this study we will seek to interpret the rankings of the top 10 and bottom 10 Library and Information Science journals across a variety of measures: impact factor, h-index, Google Scholar index, and perception rankings. Most importantly, we examine instances of concurrence and dissonance among these rankings and discuss the possible causes and implications. Three of the data collection methods – impact factor, h-index, and Google Scholar index – are objective measures. Perception ranking, in this case, requires the subjective judgment of library school deans in evaluating the quality of particular titles.

Impact factor is a well-established evaluation measure. It is tabulated by examining citations in the Institute for Scientific Information's (ISI) *Web of Science* in order to count the number of citations an article published in the past two years receives in the current year. Specifically, it "represents the ratio of citations received to articles published." [3] This measure provides quantitative data that can be interpreted fairly easily.

A more recently developed method, h-index, also provides very clear data. Created by Hirsch, this measure identifies the number of articles in a particular journal that have been cited at least that number of times. To retrieve this information, it is necessary to search by journal title in *Journal Citation Reports* (*JCR*) and sort the results by number of citations. This provides a list

[2] Thomas E. Nisonger, "The Benefits and Drawbacks of Impact Factor for Journal Collection Management in Libraries" *The Serials Librarian* 47, no. 1-2 (2004): 64.

[3] Thomas E. Nisonger, "The Benefits and Drawbacks of Impact Factor for Journal Collection Management in Libraries" *The Serials Librarian* 47, no. 1-2 (2004): 59.

of the articles in that journal ranked by most to least cited. As Chapron and Huste explain, "suppose that the 30th paper on the list had been cited 31 times, and the 31st one 30 times. This journal would have an h-index of 30, because 30 is the number of papers that received at least as many citations as their ranked position."[4] The Google Scholar index is measured in a similar fashion. Using Google Scholar, a journal title is searched. The resulting list will include the number of times a particular article has been cited, provided the article is available electronically. Unlike JCR, however, the results will not necessarily be sorted by the number of citations received. Additionally, there may be duplicate records among the search results.

Although all three of these evaluation methods are empirical, objective measures of a journal's quality, they are not infallible. It is important to note that these objective measures can be influenced in ways that make their numerical values not representative of a journal's actual quality. For example, one highly cited article can alter a journal's overall impact factor. Journals that publish frequently are likely to have higher h-indices. Objective measures of quality can be inflated when citations are included due to cronyism or other unnecessary name-dropping. Nevertheless, these objective measures are useful indicators as to the value of specific titles. To increase the accuracy of any of these measures, each should be combined with at least one other measure in order to draw comparative data for analysis.

The fourth evaluation method used in this study is perception ranking. In this case, the rankings are taken from a study conducted by Nisonger and Davis, where the authors asked ALA accredited library school deans to rank a list of LIS journals in terms of perceived quality.[5] The deans, who were chosen because they "may reasonably be assumed to be familiar with the

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[4] Guillaume Chapron and Aurelie Huste, "Open, Fair, and Free Journal Ranking for Researchers" *BioScience* 56, no. 7 (2006): 559.

quality of various LIS journals as well as the promotion and tenure policies at their institutions,"[6] responded to questionnaires asking them to place the journals on a numerical scale, from low to high. To increase the relevancy of their survey, the deans were asked to avoid rating titles with which they were unfamiliar. Although this is a subjective measure, it cannot be discounted, especially where promotion and tenure decisions are concerned. Despite the other, more objective measures, it is important to consider the opinions of deans when discussing journal quality, as they have great influence over promotional decisions. This study will examine all four methods of journal ranking in order to discover patterns among them.

In this investigation, we use four types of ranked data, h-index, Google index, perception ranking, and impact factor to evaluate a given selection of journals within the field of library and information science. We evaluate these titles using various combinations of ranked data, identify titles as strong or weak within their field, and explain trends, outliers, and patterns among the data using specific examples when necessary. Evaluating a particular journal title using more than one type of ranked data, as we do here, strengthens the conclusions we are able to make about that title.

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[5] Thomas E. Nisonger and Charles H. Davis "The Perception of Library and Information Science Journals by LIS Education Deans and ARL Library Directors" *College & Research Libraries* 66, no. 4 (2005): 341-377.

[6] Thomas E. Nisonger and Charles H. Davis "The Perception of Library and Information Science Journals by LIS Education Deans and ARL Library Directors" *College & Research Libraries* 66, no. 4 (2005): 344.

Results

The given data set included journal rankings from four analyses: citation impact factor, h-index, Google Scholar index, and Nisonger's perception study ranking (see appendix). If no correlation existed among the analysis methods used, 40 original titles (10 for each of 4 analyses) may have appeared in the Combined Top Ten. Instead, just 16 unique titles appear in the combined top ten with a consistent degree of overlap, i.e. approximately four journals appeared once, four journals appeared twice, etc. (see Table 1). This less than random distribution indicates some degree of correlation among the analysis methods. Seven of the 16 titles [Table 1; see titles with (*)] also appeared in Nisonger's top ten.

Table 1. Journals in the Combined Top Ten as determined by objective and subjective (*) analyses. Frequency = number of appearances among the top ten results for each of four analyses.

Journal Name	Frequency
Information Processing & Management* Journal of Documentation* Journal of the American Medical Informatics Association* Journal of the American Society for Information Science & Technology*	4 of 4
Information & Management Information Systems Research International Journal of Geographical Information Science MIS Quarterly*	3 of 4
Annual Review of Information Science & Technology* Journal of Management Information Systems Scientometrics*	2 of 4
D-Lib Magazine (data from Scopus) Journal of Information Science Library & Information Science Research The Library Quarterly Library Trends	1 of 4

Alternatively, there is much less redundancy in the Combined Bottom Ten (see Table 2). There are 21 unique titles among the bottom ten, only two of which appeared in the bottom ten of each of the four analyses. Only two titles from Nisonger's bottom ten appeared among the Combined Bottom Ten.

Discussion

When citation and perception data are used in evaluating faculty research for the purposes of promotion and tenure, it is advantageous to the faculty member that the journal(s) in which she has published be ranked highly. Furthermore, the more ways in which a journal ranks among

the top in the field, the better the perception of the faculty member's work is likely to be. In other words, if the journal in which the faculty member has been published is ranked highly based on citation analysis (impact factor, h-index, and/or Google Scholar index) *or* perception studies, then the journal (and therefore the faculty member's research) may be considered of relatively high quality. If the journal ranks highly based on *both* citation analysis *and* perception studies, then there is an even stronger indication that the journal is of high quality, because citation analysis and perception ranking are qualitatively different measures.

Table 2. Journals ranked in the Combined Bottom Ten as determined by objective and subjective (*) analyses. Frequency = number of appearances among the bottom ten results for each of four analyses.

Journal Name	Frequency
Harvard Library Bulletin Library and Information Science	4 of 4
Journal of Scholarly Publishing Portal: Libraries and the Academy Program: Electronic Library & Information Systems Zeitschrift fur Bibliothekswesen und Bibliographie	3 of 4
Econtent Information: Wissenschaft und Praxis / NFD Information: Wissenschaft und Praxis Interlending & Document Supply Journal of Information Ethics Library Journal Research Evaluation Restaurator: International Journal for the Preservation of Library & Archival Material	2 of 4
The Electronic Library* Information Research International Journal of Geographical Information Science* Journal of Education for Library and Information Science Law Library Journal Online Information Review The Scientist Social Science Information / Information sur les Sciences Sociales	1 of 4

In the case of the journals examined in this study, 7 journals [Table 1, starred (*) titles] were ranked in the Top 10 based both on some kind of citation analysis and on Nisonger's perception study. The remaining top ranked journals were ranked highest based on either citation data or perception ranking. Although there would probably not be much question about the

quality of any of the top ranked journals, those ranked highly by more than one method of evaluation – particularly those ranked highly in both perception and citation analysis – would be the least contentious with respect to quality.

For faculty seeking promotion and tenure who happen to have published in a low ranked journal – for example, one of the journals appearing among the Bottom 10 of the 60 journals in this study – the burden of proving journal quality is markedly greater. Fortunately, there are several kinds of information that the citation data and perception study do not take into consideration when determining journal rank and therefore quality. For example, the *Harvard Library Bulletin* (HLB) is a print publication with limited web presence and is therefore less likely to be evaluated accurately by Web of Science and Google Scholar citation data. Also, Web of Science has only indexed the publication from 1975-2004, excluding 55 years worth of material (1920-1975) from its citation data, and the HLB ceased publication between 1988 and 1990. Similarly, *Library and Information Science* (LIS) is missing 12 years of coverage from 1963-1975 in Web of Science and is a print publication.

Other titles, such as *Zeitschrift fur Bibliothekswesen und Bibliographie* and *Information: Wissenschaft und Praxis / NFD Information: Wissenschaft und Praxis*, may rank poorly because they are non-English publications and the bias in citation data – particularly in Journal Citation Reports and Web of Science – is toward English language publications. Also, a journal with a narrow or highly specialized focus, such as *Restaurator: International Journal for the Preservation of Library and Archival Material*, may rank poorly because its content is only used by a select segment of the professional population. Factors such as the number of articles published (and electronically accessible) and the frequency of publication may also impact journal rank.

Still other titles may appear as outliers because they did not belong in this comparison in the first place. *Library Journal*, perhaps the oldest periodical in the discipline, ranked among the bottom ten of two objective analyses. However, this journal, although important to the field, is not a scholarly journal and is therefore not cited as frequently as its contemporaries. It should be noted that while this journal appeared twice in the Combined Bottom Ten, it was not considered unimportant by Nisonger's subjects.

In sum, accurate journal ranking requires consideration of multiple factors. Comparing "objective" measures with perception data is the first step in determining journal quality. Calculating statistical correlations between various measures and normalizing the individual titles for scope, frequency, coverage and so on would strengthen the validity of journal ranking with respect to journal quality. Thus, journal merit can only safely be determined when attention is paid to the myriad factors which may influence objective and subjective measurements of its quality; and even then, the determined quality is actually only an estimate. Objective measures of journal quality can be influenced by anomalies such as one highly cited paper that "out-cites" its peers[7,8]; one truly influential title which was indexed incorrectly or does not appear on the web and is therefore not taken into consideration; cronyism which can have a huge impact on calculated journal quality when a discipline is small and contains few subject-specific titles; changes in journal titles which do not permeate the discipline; the perceived low quality of journals in a foreign language, regardless of the fact the speakers of and publishers in that language may be the best in their field; the frequency of publication, length of articles, and age of journal; and many others. These influences do not negate measurements of journal quality, but they must be taken into consideration when using journal quality as a tool for other

[7] After being cited more than 276,000 times, does it even matter that Lowry invented a useful protein assay?

evaluations such as collection development or tenure review. These measurements vary in their ability to accurately determine journal quality based on the circumstance for which and in which they are being used.

[8] Kresge, Nicole, Robert D. Simoni, and Robert L. Hill. "The Most Highly Cited Paper in Publishing History: Protein Determination by Oliver H. Lowry." *J. Biol. Chem*. 280, issue 28: e25.

Appendix: Journals (abbreviated titles) ranked in the Top Ten or Bottom Ten in four ranking studies: Nisonger's perception rating (Nisonger); ISI's Journal Citation Report Cited Impact Factor (Impact Factor); H-Index from Web of Science (H-Index); H-Index determined using Google Scholar (Google Scholar).

	Nisonger	Impact Factor	H-Index	Google Scholar
Top 10 in descending order	J Am Soc Info Sci & Tech	Ann Rev Info Sci & Tech	MIS Quart	MIS Quart
	Lib Quart	Info Sys Res	J Am Soc Info Sci & Tech	J Am Soc Info Sci & Tech
	Info Process & Mgt	MIS Quart	J Doc	Info Sys Res
	Lib & Info Sci Res	J Am Med Info Assn	Info Process & Mgt	J Mgt Info Sys
	J Doc	J Am Soc Info Sci & Tech	J Am Med Info Assn	Info & Mgt
	Ann Rev Info Sci & Tech	Info & Mgt	Scientometrics	Intl J Geo Info Sci
	Scientometrics	J Doc	Info & Mgt	Info Process & Mgt
	Lib Trends	Info Process & Mgt	Info Sys Res	J Doc
	J Am Med Info Assn	J Mgt Info Sys	Intl J Geo Info Sci	J Am Med Info Assn
	MIS Quart	Intl J Geo Info Sci	J Info Sci	D-Lib Magazine
Bottom 10 in descending order	E Lib	J Education Lib & Info Sci	Interlending & Doc Supply	Scientist
	Intl J Geo Info Sci	Social Sci Info	Harvard Lib Bull	Restaurator
	Interlending & Doc Supply	J Scholarly Pub	Zeitschrift…	Prog: E Lib & Info Sys
	Lib J	Prog: E Lib & Info Sys	Prog: E Lib & Info Sys	Portal: Lib & the Acad
	Restaurator	Lib & Info Sci	Portal: Lib & the Acad	J Info Ethics
	Econtent	Online Info Rev	J Info Ethics	Harvard Lib Bull
	Info: Wissenschaft & Praxis	Zeitschrift…	Res Evaluation	Lib & Info Sci
	Harvard Lib Bull	Econtent	J Scholarly Pub	Law Lib J
	Res Evaluation	Harvard Lib Bull	Lib & Info Sci	J Scholarly Pub
	Portal: Lib & the Acad	Info: Wissenschaft & Praxis	Info Res	Zeitschrift…