

Assessing the Value of a Journal Beyond the Impact Factor: *Journal of Education for Library and Information Science*

By

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## Abstract

The well-documented limitations of journal impact factor rankings and perceptual ratings, the evolving scholarly communication system, the open access movement, and increasing globalization are some reasons that prompted an examination of journal *value* rather than just *impact*. Using a single specialized journal established in 1960, about education for the Information professions, this paper discusses the fall from citation grace of the *Journal of Education for Library and Information Science (JELIS)* in terms of impact factor and declining subscriptions. Journal evaluation studies in Library and Information Science based on subjective ratings are used to show the high rank of *JELIS* during the same period (1984-2004) and explain why impact factors and perceptual ratings either singly or jointly are inadequate measures for understanding the value of specialized, scholarly journals such as *JELIS*. This case study was also a search for bibliometric measures of journal value. Three measures, namely journal attraction power, author associativity, and journal consumption power, were selected; two of them were re-defined as journal measures of affinity (the proportion of foreign authors), associativity (the amount of collaboration), and calculated as objective indicators of journal value. Affinity and associativity for *JELIS* calculated for 1984, 1994, 2004 and consumption calculated for 1985 and 1994 show a holding pattern but also reveal interesting dimensions for future study. A multi-dimensional concept of value should be further investigated wherein costs, benefits, and measures for informative and scientific value are clearly distinguished for the development of a fuller model of journal value.

## Background

The journal impact factor is traditionally used as a key measure of the influence of a scholarly journal (Garfield and Sher, 1963; Garfield, 1972). Although many conflate a journal's impact factor with the journal's quality, it is in fact a rather limited quantitative measure that cannot account for the level of quality or full value of a scholarly publication (Moed, 2005). Using the *Journal of Education for Library and Information Science (JELIS)* as an exemplar, this paper considers various journal evaluation studies, including journal studies in Library and Information Science (LIS), that measured different characteristics of a journal and uses three bibliometric measures - affinity, associativity and consumption – to assess the value of a specialized journal.

There are many compelling reasons to continue to investigate for *measures of value* for journal evaluation. First, the two primary methods of journal evaluation, the so-called objective citation-based rankings and subjective, also called perceptual, ratings by experts have been shown to have flaws. The limitations of journal impact factors, as a viable measure of quality and irrespective of the unit of analysis: research, researchers, journal or discipline, have been documented (Moed and van Leeuwen; 1995, Moed and van Leeuwen, 1996; Moed, 2002; Glanzel and Moed, 2002) as have the limitations of expert rankings (McGrath, 1987). Correlation studies which attempt to validate the methods by correlating the objective, bibliometric measures of journal impact with the subjective measures of perceptual ratings by experts have been promising in some disciplines (Cole and Cole, 1973). But they have not fared as well in others. Social Work and Marketing

have not revealed strong correlations between the two (Mathieson et al, 2004; Theoharakis and Hirst, 2004). Across the social sciences, Christenson and Sigelmen (1985) reviewing correlation studies concluded, “correlation are not really strong enough to permit us to conclude that a journal’s reputation is a simple function of scholarly influence. Approximately two-thirds of the variance in the reputed quality of political science journals and three-quarters of the variance in the reputed importance of sociology journals remain unexplained by the SSCI impact scores.” (p.269). In LIS, disciplinary impact factors, rather than journal impact, correlated better with prestige ratings (Kim, 1991). Second, recent developments such as the serials price crisis have stimulated changes in the existing economic journal publishing models. For example, the disaggregation of journals provokes questions about the value added to papers by a journal and to consider at least two other kinds of measurements. These measurements include production costs such as cost per unit in terms of pages and articles and usage, i.e., cost-per unit, assessing readership, potential and actual use, in various situations. Scientists might not agree with costs as a measure of value, but the reality is that papers that are not cited are essentially fulfilling other roles; that is, while they may not visibly add to the communal growth of knowledge they may contribute other benefits that offset costs. It is important to discover and measure these benefits especially in the face of large scale patterns of uncitedness. In LIS the rate of uncitedness is estimated at 72 % (Schwarz, 1997). van Leeuwen and Moed (2005), although not focused on LIS, provide evidence that “journals that contain a smaller number of publications tend to have a larger share of uncited papers” (p. 370) and have suggested future research into the role of journal frequency and the number of subscriptions spread periodically. Third,

globalization in the scholarly journals of many disciplines requires measures that reflect it (Richardson, 2002). Lastly, open access to the literature is changing scholarly communication in many ways. Digital repositories, for example, are tools to innovate scholarly communication by supplementing publishing; however, they are also increasing information overload since not all papers that are relevant to the topic can be cited. Familiarly known as the citation bias phenomenon, the extent to which the citation measures impact becomes even more debatable and ambiguous. Did the author really read all the articles and choose the best one? Impacts studies of open access databases and services such as Citeseer (OpCit, 2005) demonstrate the validity of newer measures for impact as well but further call into question the function and role of journals in the scholarly communication system of a discipline and add to the need for holistic measures of various aspects of a journal. An examination of *scholarly journal value* rather than performance or quality is thus timely.

The case study methodology is used in the search for new measures of journal value; the approach may be called a critical theory-influenced case study (Cresswell, 1997). In this case study the bounded system investigated is a scholarly journal, *JELIS*, and the results by which it has been evaluated publicly, often as part of the larger network of LIS journals, are funneled and examined critically. Drawing a bibliometric journal profile such as von Raan et al (2003) have shown and correlation, whereby *JELIS* impact factors, along with other measures are calculated and compared with perceptual ratings for selected top journals, are also valid methodologies. Correlation, however, would not have yielded data about *value*; at best, it would only have confirmed a rating or ranking

based on impact or subjective measures when a major purpose of the study is to investigate the notion of journal value. Hence they were not used. Based on the analysis of the case, three bibliometric measures for assessing specific aspects of journal value are selected, defined and calculated in an attempt to build a fuller picture of value than that revealed through a single index or measure or perceptual rating. In developing the measures, ease of interpretation and computational feasibility have been accommodated; the hope is that they can be added to the ISI indexes such as the *Journal Citation Reports* and other abstracting and indexing databases such as *Library Literature*, *Library and Information Science Abstracts*, and *Library and Information Science and Technology Abstracts*, as preliminary indicators of journal value.

The choice of *JELIS* as the case to illustrate journal value was a pragmatic one; the *JELIS* transition from one editor to a new team was considered an appropriate time for one of the new editors to take a close look at the journal's influence from a variety of angles. *JELIS* also represents an 'atypical' case; it is typed as a research rather than a practitioner journal (Kim, 1991). Yet its subject focus – education for the library and information professions – appears to be very narrow, teaching-practice and action-research oriented. It is also of critical importance to the future of the disciplines and professions involved. Limitations apply. The findings reported are a starting point for developing a value theory and model of scholarly journals that is able to explain the role of small specialized ones which are often not included as part of the ISI-ranked journals, and increase our understanding of their place and value in the scholarly communication system. The bibliometric measures identified, should be tested further, with a larger group of journals.

## **Journal Evaluation Studies**

Examining the literature of scholarly communication we find that journals can be evaluated by many factors other than impact and numerous citation studies and journal evaluation studies exist. They provide a long list of criteria to choose from by which journals may be evaluated. Nisonger (1999) provides a list of published studies of LIS journals as well as a list of the criteria used to compile the citation rankings of the journals in these studies. The 178 LIS journal studies he examined are classified in terms of criteria used and fall predominantly into four categories of citation (94 studies), production (33 studies), subjective judgement (25), reading (18 studies). The remaining 8 studies used miscellaneous criteria such as familiarity, readability/reading ease, currency of citations, etc. (p. 1007) Nisonger's use of the term "production" is not the same as journal/article production costs; rather, it appears to be a mix of productivity studies such as how many research articles by Canadian information scientists, and presentation or distribution, such as the number of abstracts in abstracting services, number of "substantive articles" (p. 1013)). Tenopir and King (1998) provide a detailed discussion of statistical measures for electronic journals and these are organized into the categories of publishing, authorship, readership, pricing, and library services. Create Change (2000) urges scholars to value journals by recommending three kinds of measurements: production costs such as cost per unit in terms of pages and articles, citation analysis such as impact factor, and usage, i.e., cost-per unit in a local situation or narratives and statements of use. Many of these additional measures are all in keeping

with recommendations made by prior researchers including Garfield, the creator of the impact factor, for improving the findings from impact analysis. However, the journal impact factor continues to be the predominant measure for evaluating journals.

The impact factor, introduced first by Garfield and Sher (1963), is a measure of importance or influence based on the number of citations during a given period of time. Impact can be calculated for a journal, an author or a discipline. Journal impact factor is also called the Garfield impact factor, journal citation rate, journal influence or impact. *Journal Citation Reports (JCR)*, a database published by Thomson ISI, calculates a 2-year journal impact factor in the following way (any year can be used; the year 1997 is just an example):

A = Total cites in 1997

B = 1997 cites to articles published in 1995-96 (this is a subset of A)

C = number of articles published in 1995-96

D = B/C = 1997 impact factor

Although journal impact factors are often taken from *JCR* they can also be computed by using the *Web of Science (WOS)* citation indexes (*SSI, SSCI & A&HCI*) produced by *Thomson ISI* or hand-tallied (Stegmann, 1999). Such computed impact factors are called constructed impact factors and there are many reasons why in some disciplines a four or five-year impact factor may be better (Rousseau, 1988; Garfield, 1994). Garfield has always warned of the limitations of journal impact factors, Smith (1981) is still one of the best critiques identifying the limitations of citation analysis, and Seglen (1997) presents

many reasons why journal impact factors are not representative of individual articles in the journal. Journals' impact factors are determined by technicalities unrelated to the scientific quality of their articles. Journal impact factors depend on the research field: high impact factors are likely in journals covering large areas of basic research with a rapidly expanding but short lived literature that use many references per article. Journal production factors such as publishing time lags and accessibility affect citation rates and small scholarly society journals are more likely to be plagued by publishing delays and inadequate access. Cole, S. (2000) and Cole, J.R. (2000) highlight more issues in the quality versus impact dilemma facing journals and evaluative bibliometrics; for example, Cole, S. shows why readers should not use the impact factor of a journal to evaluate the quality of an individual article (p. 132) while Cole, J.R. describes cases such as Fogel and Engerman's *Time on the Cross* which received a large number of "negative" citations (p. 293). As has been noted earlier, Moed (2002), and Moed and van Leeuwen (1995, 1996) have done extensive work on the disadvantages of journal impact factors, showing, that in the statistical sense they are nothing but simple averages; a better representation of a journal's bibliometric impact is given by its entire citation distribution. An integrated journal citation impact model that reflects other characteristics continues to be investigated (Yue and Wilson, 2005) and using only impact factors to determine *journal value* is clearly insufficient.

### **The Value of a Scholarly Journal**

Value, however, is not a term found often in the literature of bibliometrics; in fact, the Dictionary of Bibliometrics (Diodata, 1994) does not even include an entry for the word. The *Encyclopedia Britannica* defines value “in economics, the determination of the prices of goods and services” in conjunction with utility (2005). This is similar to economics of information, where value is expressed most often in the form of benefit-cost ratios and journal effectiveness studies can be found. Journals have value, beyond utility, that can be converted into benefits using other bibliometric measures. The search for a definition of value, however, should be multi-disciplinary, as the evaluative act permeates across all disciplines (Christ, 1972) and therefore, the literature of the social sciences were briefly searched.

Value theorists in sociology generally use two approaches to define the term: it may conceptualize areas such as good, desirable, worthwhile and in the broader sense it can be used to describe a wider range of scale, like temperature. The term, worth, is the synonym of value, a polysemic term, that is a word with one or more meanings (Stark, 2000). Worth and value are often expressed in terms of money and importance, and the search is for universal and human values. Hitlin and Piliavian (2004) reviewing the research in sociology on human values note “values are ignored as too subjective or too difficult to measure accurately” (p. 359); and that the the two instruments for measuring human values, *Rokeach Value Survey* and the *Schwartz Value Survey* differ in some important respects. *Rokeach* forces respondents to rank while *Schwartz* affirms a rating, non-forced choice approach. Generally the rating approach seems better for purposes of research, although methodological issues such as context and longitudinal study need to

be accommodated (p. 367-368). In archeology, four different types of values are used in the assessment of a site for determining archaeological value: associative/symbolic, informational, aesthetic, and economic. Sites that contribute to building a sense of identity be it group or national have associative or symbolic value. Informational value, is often the paramount value for researchers and these include sites that contribute to formal research while aesthetic value is most appreciated by the general public, generally does not require contextual information, and is what contributes to the competition between the art market and pure archeology. Economic value is determined by the monetary benefit of the site. (Lipe, 1984). Similarly, in determining the value of open space Berry (1976) proposed six different types based on human values: utility, functional, contemplative, aesthetic, recreational, and ecological. In the latter part of the twenty-first century differential assessment programs which assess property at use value rather than at market value were developed in the United States in response to the push to develop land and preserve land in open uses (Coughlin, Berry, and Plaut, 1978). A similar rubric for assessing journal value is necessary and can be developed by identifying the human values that characterize scholarly journals and which may already be reflected in the structural properties of journals as well as in other available measures for evaluating journals.

Todorov and Glanzel (1988) and Rousseau (2002) provide a general review of bibliometric and other kinds of measures for evaluating a journal and embodying the human values inhered by scholarly journals. Rousseau (2002) summarizes the 10 characteristics of a “quality” journal by reviewing Zwemer (1970), Garfield (1990) and

Testa (1998). These ten characteristics are listed below and some measures are given as examples in parentheses:

- 1) High standards of acceptance (acceptance and rejection rates)
- 2) Subject and geographical representativeness of the editorial board
- 3) Use of a critical refereeing system
- 4) Promptness of publication
- 5) Coverage by major abstracting and indexing services
- 6) High confidence level of scientists using the journal in its contents
- 7) High frequency of citation by other journals (impact)
- 8) Inclusion of abstracts/summaries in English
- 9) Providing author(s) addresses (author reputation score)
- 10) Providing complete bibliographic information

Very few journal evaluation studies have tried to measure the multi-faceted “quality” and the corresponding value of journals indicated by all the characteristics above. Also, while quality is conflated to impact, most studies use the terms, status, importance, influence, prestige to mean quality and ignore distinctions. Table 1 provides an overview of the measures, the studies which used them and a selective discussion follows below.

**Table 1: Citation and subjective measures proposed for ranking or rating journals in reviews and journal evaluation studies**

Source (authors) of the study or review	Review and Type of study (Citation based ranking studies versus Perceptual rating by experts)	Measure (s)
Todorov and Glanzel (1988)	Review	<u>Objective measures:</u> Citation Rate, Journal Impact Factor, Immediacy Index, References per Paper, Citing Half-Life, Disciplinary Impact Factor, Adjusted Impact Factor, Influence Weight, Mean Response Time, Uncitedness, Self-citedness, Popularity Factor <u>Subjective measures:</u> Editorial standards, Journal origin and orientation, Type of research covered, Age, Degree of specialization, Circulation size, Reprint distribution, Acceptance and Rejection rates
Rousseau (2002)	Review	Impact Factors (synchronous & diachronous), Subscriptions, Circulations (in-house, inter-library loan, etc.), Abstracting and Indexing Coverage
Pinski and Narin (1976)	Citation-based ranking	Influence Weight
Salancik (1986)	Citation-based ranking	Importance Index
Doreian (1988)	Citation-based ranking + additional criteria	Standing, Value, Rigor, Interest
Theoharakis and Hirst (2004)	Perceptual rating	Familiarity, Average Ranking Position, Readership
Krishnan and Bricker (2004)	Citation-based ranking + additional criteria	Article Quality, Author Reputation Score, School Reputation Score, Journal Value-Added Proxies (journal age, editorial board, readership and stimulation)

Smart and Elton (1981) examined 148 education journals and explained the variability in their citation frequency in terms of the structural characteristics of the journal. Education journals complied with Bradford's Law and had a well-defined core of 41 journals which carry out the research communication function and represent the research literature in the field. Another early study by Doreian (1989) used factor analysis to construct a set of scales that tapped various dimensions. An assessment of value, which was very simply judged as valuable-worthless and good-bad, was one factor (p. 208). Krishnan and Bricker (2004) examined top finance journals in order to assess the value added by journals to articles using a multi-faceted assessment of various journal characteristics such as age, editorial board quality, readership and stimulation besides citation counts. Specifically, they show how these characteristics quite apart from citations and impact factors contribute to the notion and measurement of journal quality and its value. Acceptance (Krishnan and Bricker, 2004) and rejection rates (Rotten, Levitt, and Foos, 1993) have also been theorized as measures that could be used for studying journal value; meta-analyses such as Rainier and Miller (2005) who produced a composite journal ranking of 50 journals in MIS using the data from nine published journal ranking studies from 1991-2003 (ISWorld, 2005) also exist. With the exception of Smart and Elton (1981) the above studies have been hybrids – combining rating and citation measures – and in other disciplines. Examining LIS journals, Kim (1992) compared three citation measures of journal status, a characteristic that she also acknowledges is multi-dimensional, as alternatives to the impact factor: influence weight, importance index, and standing. She concluded that the context should determine the choice of the measure for evaluation, encouraged further research such that these could indeed add

improvements or supplement the impact factor, and suggested a battery of techniques for journal assessment rather than reliance on a single method.

### **The Case of the *Journal of Education for Library and Information Science (JELIS)***

*JELIS*, ISSN: 0748-5786, is a publication of the Association for Library and Information Science Education (ALISE), vol. 25-present (1984-present). *JELIS* started as the *Journal of Education for Librarianship (JEL)*, ISSN: 0022-0604, Vol. 1-24 (1960-1984) and was the official publication of the Association of American Library Schools (AALS). The association's publishing history with predecessors of *JEL* (Winger, 1985), two bibliometric studies of *JEL/JELIS* (Lehnus, 1971; Schrader, 1985a, 1985b), a readership survey (Patterson, 1985), and a history of the AALS are available (Davis, 1974; Davis, 2004). When it began as a quarterly journal with the Summer 1960 issue, *JEL* replaced three association publications: the *Reports of the Meeting of the Association of American Library Schools*, the *AALS Newsletter*, and the *AALS Directory*. (Horrocks, n.d.).

Including the present incumbents, there have been 10 *JEL/JELIS* editors over the past 45 years and the current *JELIS* Editorial Board consists only of faculty from schools of Library and Information Science (LIS) in North America. In 1959 the circulation of the journal, which includes subscriptions as a benefit of ALISE membership as well as library subscriptions was about 400, increasing by 1973 to 1,936, and falling to 1,001 in mid-2005.

*JELIS* “is a quarterly scholarly journal in the field of library and information science education, serving as a vehicle for presentation of research and issues within the field.” (*JELIS*, 2005). Four types of publications are considered for *JELIS*: articles, brief communications, reader comments, and guest editorials. The journal is indexed and/or abstracted in *Current Contents*, *Current Index to Journals in Education*, *Education Index*, *Education Abstracts*, *Information Science Abstracts*, *Library and Information Science Abstracts*, *Library Literature and Research into Higher Education Abstracts*. Remote electronic access to full-text is available beginning with Vol. 44, No.3/4 (Summer/Fall 2003) through an agreement with H.W. Wilson. Additionally, 12 articles and columns from the 1996 issues of *JELIS* were made openly accessible in December 2004. These materials are available through the open access archive, *dLIST*, the *Digital Library of Information Science and Technology* (DLIST, 2006).

A search in *Ulrichs Periodicals Directory* for all scholarly journals in library and information science education retrieved only nine titles none of which have the same scope as *JELIS*. These are: *Teacher Librarian Journal: the journal for school library professionals*, *School Library Media Research*, *School Librarian*, *The New Review of Libraries and Lifelong Learning*, *Knowledge Quest*, *Journal of Library and Information Services for Distance Learning*, *Journal of Education for Library and Information Science*, *Education Libraries Journal*, and *Education Libraries*. Only one other journal exists that might conceivably be thought to have the same subject scope: *Education for Information* (ISSN 0167-8329) which started in 1983 and is published by IOS Press (Netherlands). None of these journals are indexed by ISI.

On the impact factor front *JELIS*, is not considered to be a high-impact publication. *JCR* no longer covers *JELIS*; “the journal's Impact Factor and corresponding rank-in-category were declining through the '90s. In '95 the Impact Factor was 0.241, in '96: 0.121, in '97: 0.032, in '98: 0.0, and so on. The journal was dropped in 2000.” (Joyce, 2005). *JCR 1997* was the last time when a *JELIS* impact factor was publicly reported. *JELIS* had an impact factor of 0.032 and was ranked in two different categories in the *Social Sciences Citation Index*: 1) education and educational research, and 2) information science, library science. Table 2 summarizes the data from *JCR 1997* for *JELIS* along with the top ranked journal and the lowest ranked journal in which it is indexed as a comparison.

**Table 2: Summary data in 1997 Journal Citation Reports for JELIS and the top ranking and lowest ranking journal in the same category**

ISI Subject Category	Number of Journals in the Category	Top Ranking (#1) Journal in Category	Rank of JELIS in the Category	Lowest Ranking Journal in Category
Education and Educational Research	102	<i>American Educational Research Journal</i>  Rank: 1 Total cites: 931 Impact Factor: 2.322 Total articles: 24 Immediacy Index: 0.292 Cited Half-Life: 7.7	Rank: 98 Total cites: 2 Impact Factor: 0.032 Total articles: 26 Immediacy Index: N/A Cited Half-Life: N/A	<i>Russian Education &amp; Society</i>  Rank: 102 Total cites: 1 Impact Factor: 0.0  Total articles: 58 Immediacy Index: 0.0 Cited Half-Life: N/A
Information Science, Library Science	56	<i>Journal of the American Medical Informatics Association</i>  Rank: 1 Total Cites: 293 Impact Factor: 2.164  Total articles: 54 Immediacy Index: 0.444 Cited Half-life: 2.5	Rank: 55 Total cites: 24 Impact Factor: 0.032  Total articles: 26 Immediacy Index: N/A Cited Half-Life: N/A	<i>Proceedings of the American Society for Information Science Annual Meeting</i>  Rank: 56 Total cites: 37 Impact Factor: N/A  Total articles: 31 Immediacy Index: N/A Cited Half-Life: N/A

Irrespective of the categories, we find that the impact factor of *JELIS* is pretty much at the bottom. LIS journals perceptual ratings studies were next examined.

Data from three different studies (Kohl, 1985; Blake, 1996; Nisonger and Davis, 2005) show the place of *JELIS* in perceptual ratings studies of LIS journals. Data from all three studies is shown in Table 3 and the findings of each study further explained.

**Table 3: Rank of *JEL/JELIS* in LIS journals perceptual ratings studies and the Relative rank position**

Source (name) of the study	Number of LIS journals in the study	Rank in the Rating of <i>JELIS</i> by ARL Library Directors	Relative rank position calculated in terms of total number of journals in the study	Rank in the Rating of <i>JELIS</i> by Library School Deans	Relative rank position calculated in terms of total number of journals in the study
Kohl and Davis (1985)	31	# 15	0.483	# 5	0.161
Blake (1996)	57	# 18	0.315	# 6	0.105
Nisonger and Davis (2005)	71	# 23	0.323	# 12	0.169
Nisonger and Davis (2005) *	71	# 31	0.436	# 28	0.394

\* Average rating of journal prestige in terms of value for tenure and promotion by Directors and Deans: Not familiar and blank responses are not considered

Kohl and Davis (1985) attempted to measure the prestige and the top-five (two separate ranking criteria and lists) LIS journals. It was a rating study that ranked 31 core library journals by the directors of ARL libraries and library school deans. Some variation was found in the journals viewed as prestigious for tenure and promotion and top five. For prestige, *JEL* was ranked fifth by library school deans and # 15 in the ARL directors' list. In terms of importance, for the top five, *JELIS* ranked # 5 on the deans list and did not even show up on the directors list. *JEL* also featured as the fourth journal in the final list of 11 journals whose ratings by ARL directors and library school deans varied significantly (significance level <.001).

Ten years later Blake replicated the 1985 Kohl-Davis perceptual rankings of LIS journals study (Blake, 1996) with an expanded list of journals; he used the original 31 plus new journals in the area, for a total of 57. He found that the two populations – ARL directors and library school deans – now held very different views on the LIS journals. *JELIS* fell to #6 in the prestige list of the deans and ranked #18 in the directors list; *JELIS* continued to hold its #5 place in the most important top-five journal ranking in the core subset of LIS journals with 24 deans and 13.4% indications; it was ranked # 18 with only 2 of the 48 directors and 0.7% indications selecting it as an important journal. But this is actually promising news because *JEL/JELIS* did not even receive one vote, in terms of importance, from the ARL library directors in the original study (Kohl, 1985, p. 46). The variation in the rankings by the two populations however drew Blake to the following conclusion: “a major issue facing library/information science education is how to satisfy the demands of research within graduate education without becoming isolated from the

library/ information science professions themselves. Confronting this question may lead to a reconfiguration of both faculty responsibilities and the locus of library/information science education in the evolving information age.” (concluding para). Incidentally, a similar prestige study of LIS journal rankings by Tjoumas and Blake (1992) found that LIS faculty also ranked *JELIS* among the top five journals.

More recently Nisonger and Kohl (2005) repeated the original Kohl-Davis (1985) study. In terms of prestige they found that *JELIS* ranked #12 on the library school deans list and # 23 on the directors list when unfamiliar and blank responses were counted as 0. The two groups also ranked completely different journals in the top five with only journal held in common: *Library Quarterly*. There was remarkable continuity in the directors choices and less so in the deans but Nisonger and Davis (2005) concluded that “[j]ournal value is multi-faceted, so that a low-ranking journal in this study may still be important for supporting teaching, professional practice, a specialty area, or some other purpose.” (p. 375). Thus, even as the impact factor for *JELIS* was declining starting in the mid-1990s library school deans continued to rank *JELIS* highly. In Table 3, the relative rank position calculations for *JELIS* indicate that the journal has tended to remain in a holding pattern despite the increasing number of journals in each study, from 31 to 71. Correlation studies, presented next, only partially explain the discrepancies between *JELIS* impact factors and ratings.

### **Correlating Citation Measures with Perceptual Ratings**

Kim (1991) compared the subjective and citation-based measures of a number of LIS journals in an effort to understand those journal characteristics that might be contributing to the prestige factor i.e. the other dimensions of quality besides impact that citation measures can show. She used the original 31 journals in the Kohl-Davis (1985) study but expanded it to a 51-journal network and then reduced it to a final list of 28 as her methodology was considerably complicated and involved hand-tallies. Her data shows that *JEL* was within the top twelve journals ranking when the following subjective and citation based measures were used: prestige, when ranked by library school deans, with discipline citation factor, discipline popularity factor, discipline consumption factor, and discipline self-citation rate. *JEL*, whose orientation was categorized as research rather than practitioner, failed to feature in ranking lists that used demographic measures such as age, circulation, or indexing coverage. Table 4 shows the rank of *JEL* (n=12) with data extracted from Kim (p. 28).

**Table 4: The rank of JELIS in terms of varying journal characteristics  
(Source: Kim, 1991)**

<b>Characteristics in the Kim (1991) study</b>	<b>Rank (n=12) in the Kim (1991) study</b>
Prestige (ARL directors)	0 (unranked)
<i>Prestige</i> (Library school deans)	<i>11*</i>
Total Discipline Citations	0 (unranked)
Discipline Impact Factor	0 (unranked)
Discipline Immediacy Index	0 (unranked)
References Per Paper	0 (unranked)
Price Index	0 (unranked)
<i>Discipline citation factor</i>	<i>8</i>
<i>Discipline popularity factor</i>	<i>9</i>
<i>Discipline self-citation rate</i>	<i>8</i>
<i>Discipline consumption factor</i>	<i>8</i>
Age	0 (unranked)
Circulation	0 (unranked)
Index Coverage	0 (unranked)

\* Kim's method took the original Kohl-Davis list of 31 journals and expanded it to a 51-journal network from which only 28 journals were finally more closely studied.

Kim tested several hypotheses related to all these measures and her major findings offer a clue to what may be happening with some journals including *JELIS*: journals with higher self-citation rates tended to be more highly specialized within a sub-discipline, received

fewer citations from the LIS journals in the network, and ranked lower on the discipline consumption factor. Kim found that 1) discipline citation measures identified a core of top journals, which overlapped well with the core listings of directors and deans, but 2) while both groups “valued publication in journals which fed information to the network” (p. 34), 3) deans and directors appeared to use different criteria to judge the value of a publication for tenure and promotion. Deans valued *scholarliness* which they defined as the absence or presence of references (Windsor and Windsor, 1973) and references per paper, and *journal consumption* defined as citation rates in older practitioner journals. Directors valued *timeliness* (recency, news or immediate practical value). Her findings, she concluded, supported the need to evaluate research and practitioner journals separately when the knowledge structure of a profession, such as LIS, is being investigated.

### **The *JEL* Bibliometric Study**

Kim (1991) categorized *JEL/JELIS* as a “research” rather than professional journal in it’s orientation. She also found that in keeping with findings from citation and impact studies in other disciplines *JELIS* had a high self-cited rate suggesting specialization; this is corroborated by Schrader who completed the first bibliometric study of *JEL* (1985a, 1985b) and traced its development from a news journal in the 1960s to a scholarly research journal in the 1980s focusing on education for professional work in libraries and other information environments. Schrader’s findings are crucial in helping to identify the value dimensions of *JEL/JELIS*. They show that *JEL* accomplished a change to a

research journal; in 1971 peer-review was implemented and this led to a growth in the number of peer-reviewed articles published in *JELIS*. An increase in scholarliness, as measured through growth of citations, was evidenced by growth in terms of 1) the number of references cited in the articles, 3) number of articles submitted, rather than other ‘types’ of publications, 4) size of article and 5) number of collaboratively authored articles. *JEL* growth and distributions data in terms of subject, author affiliations, both institutional and geographic, and cited journal distributions are summarized below.

*Growth:* *JEL* published a total of 473 articles which contained a total of 3,655 references of which 156 had no references whatsoever.

*Subject coverage:* When the coverage of subjects was ranked, a list of narrow subjects within the discipline, as shown in Table 5, emerged with international and comparative librarianship and library curriculum concerns as the top themes.

**Table 5: The subject coverage of *JEL* from twenty to forty years ago**

<b>Subject coverage in <i>JEL</i>, 1960-1984 from the Schrader (1985) study</b>
International and comparative library education
Curriculum – reference services
Curriculum – design and development
Curriculum – core courses
Curriculum – cataloging and classification
Curriculum – special librarianship
Curriculum – book selection
Curriculum – aims and objectives
Library education – aims and objectives
Library education – philosophy

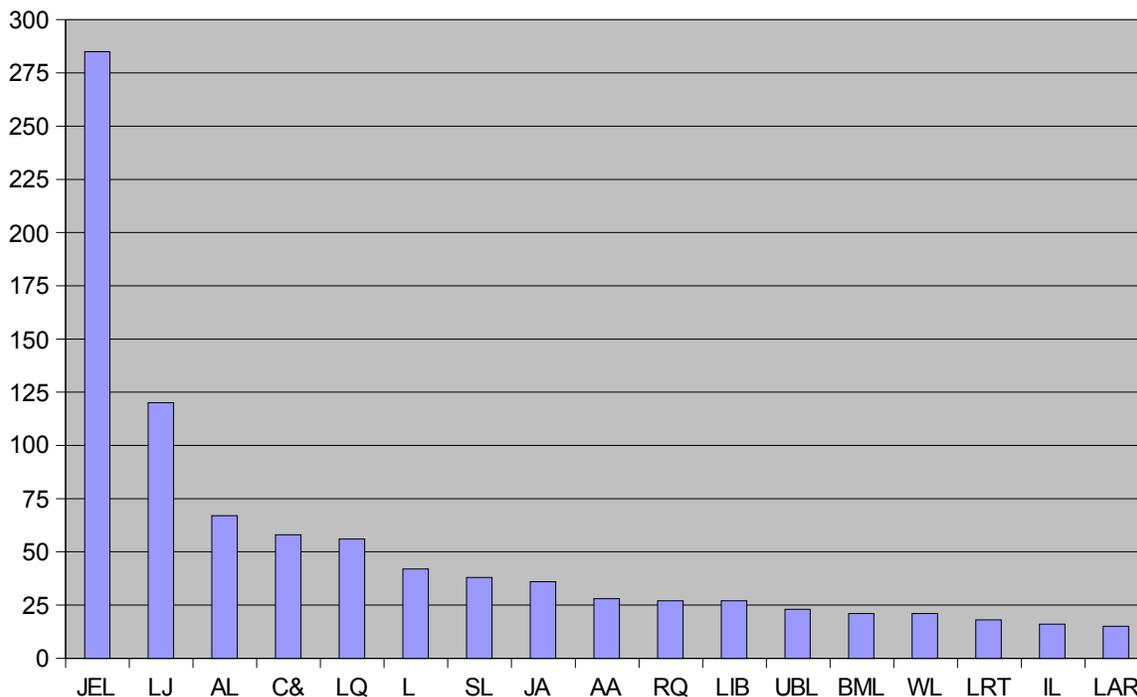
Source: Schrader (1985)

*Affiliation distribution:* Seven out of ten first authors were educators, i.e. 100 of the 473 authors were practitioners (21%); 340 were educators (72%); 16 students both doctoral and master's (3%); and 6 were unidentified (1%). This led Schrader to wonder: "The presence of such a considerable proportion of practitioners raises the interesting question of whether or not the educators are intellectual masters in their own domain." (p. 291)

*Collaboration distribution:* Joint authorship, almost unknown in the early years of the journal, patterns changed and by the early 1980s one of three articles was authored by two or more individuals.

*Geographic distribution:* The geographic distribution of first authors showed that 90% were American, 5% Canadian or British, and the remainder came from 14 different countries.

*Cited Journal distribution:* *JEL* was the most cited journal in *JEL* articles (receiving 285 citations) with *Library Journal* receiving the next highest number (but still only 50% of what *JEL* received). 17 journals received almost 900 citations while 282 other journals accounted for the rest, 581 of the citations. For Schrader, the reliance on "news" publications such as *Library Journal* and *ALA Bulletin* "raises important questions about the qualitative nature" of the scholarship reported. (p. 294).



**Figure 1: Cited journal variability (includes times cited) to JEL (1960-84) articles** (titles are: LJ - *Library Journal*, AL - *American Libraries (ALA Bulletin)*, C& - *College & Research Libraries*, LQ - *Library Quarterly*, SL - *Special Libraries*, JL - *Journal of the American Society for Information Science & Technology*, AA - *American Archivist*, RQ - *Reference Quarterly*; LIB - *Libri*, UBL - *Unesco Library Bulletin*, BMLA, *Bulletin of the Medical Library Association*, WLB, *Wilson Library Bulletin*, LRTS - *Learning Resources & Technical Services*, IL - *Illinois Libraries*, LAR - *Library Association Record*)

Despite “increasingly rigorous scholarship among library science educators and authors” Schrader concluded: “the goal of any field is intellectual consensus, and none of the indices developed in this study point to the existence of such a consensus. There is on the conceptual level, little interest in the philosophical foundations of library science education. There is no well-defined core of either contributing authors, cited authors, or cited works over the 24-year period examined in the study.” (p. 297). In addition,

Schrader wondered about exactly who – practitioner or educator - was the master of the education for LIS domain. Schrader's conclusions seem overly pessimistic. Bibliometric indicators for *JELIS*, 1984-2004, calculated for specific years and aspects, that have emerged from the foregoing discussion, are promising.

### **Bibliometric Measures of Journal Value – *JELIS* Study, 1984-2004**

The *JELIS* bibliometric study gathered data about *JELIS*, 1984-2004, from three databases: *Library Literature (LL)*, *Library and Information Science Abstracts (LISA)*, and *Web of Science (WoS)*. Data from *LISA* was discarded as it was lacking in *JELIS* coverage for 1984-1997. There were a total of 821 records in *LL*. Coverage of *JELIS* in *WoS (SSCI)* ended with 2000; 718 records were downloaded from this database. Besides incomplete coverage as both databases had missing items which had to be manually checked with print issues in hand, the data gathering and analysis effort faced a number of other difficulties as well. For example, both databases classified document types quite differently. The classification of document types, in order to include only *articles*, as opposed to editorial material and columns in some of the bibliometric calculations, had to be done on an item by item basis and checked manually against a print copy. Four years, 1984, 1985, 1994, and 2004 were selected to serve as waypost years or milestones and data for them gathered and analyzed. Table 6 shows the total number of records from each database and the breakdown for selected years that have been manually checked with a print copy; it also shows the relevant data that has been collected from the *WoS* about citations received by *JELIS*.

**Table 6: Selective *JELIS* - 1984-2004, bibliometric data**

	1984	1985	1994	2004	Total
Number of authors (number of foreign authors in parentheses)*	15 (1)	20 (1)	22 (8)	35 (13)	92 (23)
Number of articles**	10	16	18	23	67
References per paper	9	13.5	26.2	19.4	18.2
Number of citations received***	13	64	28	0	105
Number of references made***	90	216	472	447	1225
Number of citing journals***	6	22	16	0	44
Number of cited journals*	27	78	34	60	199

\*Source: Manual check of printed copies and cross-checks with databases

\*\* Source: *Library Literature*, So=JELIS and Limits of Publication year=1984-2004

\*\*\*Source: *Web of Science* (Source title and cited references searching, duplicates eliminated, only data for 'articles' included, errors and missing information corrected)

For the selected years of 1984, 1985, 1994, and 2004, *JELIS* published a total of 67 research articles. The 67 articles received 105 citations from 44 distinct journals. There were a total of 1225 references in the 67 articles, which includes 199 distinct journal titles. 92 authors wrote the 67 papers of whom 23 were from foreign countries.

The coverage of subjects for the period, 1984-2004, is reported next. It should be kept in mind that the subject headings reflect the commercial indexer's vagaries. 476 unique subject headings were assigned to all articles for the period; this excluded columns and editorial materials. The emerging pattern is one of a diverging and expanding discipline more broadly conceptualized as education for the information professions. Tables 7 and 8 show two different views of the subject coverage. Table 7 provides an overview of the percentage of articles that are in these subjects, tracing the pattern over the three decades of the study (1984-89, 1990-1999, and 2000-2004) for all document types (articles, editorials, columns, and book reviews). Table 8 shows the subject headings for articles only across all twenty-five years. Irrespective of the type of document, the predominant subject is *Library schools* followed by *Education for librarianship*. Other well-defined topics of interest, although not always as discrete sub-disciplines, are discernible. *Library schools* in terms of *Curriculum* and *Faculty* are the predominant topics and *Surveys* are the most widely used methodology for the research. The teaching of traditional library activities/services such as *Cataloging* and *Reference* as well as relatively newer ones such as *Bibliographic Instruction* and *Online Searching* are well represented. As the field and journal matures, articles about modes of information delivery such as *Distance education*, and educational concepts such as *Cognition*, are included. Disciplinary-level headings such as *Information Science*, *Communication*, and topics such as *Hypermedia*, *Multiculturalism*, *Feminism*, and *Bibliometrics*, and other information environments such as *Archives*, are merging. Not all of these are in the tables but articles covering them have been published in the journal. They reflect the addition of new topics while keeping older ones, and indicate multi and inter-disciplinary expansion.

**Table 7: The subject coverage of *JELIS*, last twenty-five years, all documents**

<b>Term</b>	<b>1984-1989</b>	<b>1990-1999</b>	<b>2000-2004</b>
Document Type breakdown*	177 articles; 53 book reviews	349 articles; 62 book reviews; 2 Others	134 articles; 15 book reviews 29 Others
Library schools**	28%	24%	32%
Education for librarianship***	-	16%	16%
ALISE	8%	10%	-
Associations	10%	-	-
Speech	4%	28%	-
Conferences	-	6%	
Surveys	10%	-	14%
Use studies	-	-	6%
End user searching	-	-	4%
Cataloging	4%	-	-
Reference services	12 %	-	-
Information Science	-	-	6%
Cognition	-	6%	6%
Research in librarianship	-	8%	8%
Paraprofessional	-	-	6%
Distance education	-	-	8%
Continuing education	6%	8%	8%
College and University Libraries	4%	-	-
Censorship	-	6%	-

Source: *Library Literature* (search for *JELIS* documents, 1984-2004)

\* Document type breakdown is per the source database

\*\* Includes subdivisions such as curriculum

\*\*\*Includes subdivisions such as curriculum, faculty, aims and objectives.

**Table 8: The subject coverage of JELIS, 1984-2004, Articles**

<b>Subject headings for <i>JELIS</i> (from <i>Library Literature</i>)</b>	<b>Number</b>
Library schools - Curriculum	64
Library schools -- Faculty	36
Distance education	31
Surveys – Library schools	29
Information science -- Teaching	26
Education for librarianship -- Evaluation	20
Research in librarianship	16
Continuing education	15
Education for librarianship	14
Library schools -- Evaluation	13
Library schools -- Students	13
Cognition	12
Archivists -- Education	12
Cataloging -- Teaching	11
Computer-assisted instruction	11
Research in librarianship -- Evaluation	11
Bibliographic instruction -- Teaching	9
Internet – Library schools	9
Education for librarianship – Aims and objectives	9
Library schools – Practice work	9
Library schools – Post-master's and doctoral programs	9
Online searching – Teaching	9

Table 9 shows the breakdown of the authors in terms of their status as educators, practitioners or others for three years in the period, 1984, 1994, and 2004. As can be seen, a majority of the *JELIS* authors (61%) are LIS faculty, 15% are librarian-practitioners, and 24% are students, consultants and faculty in other disciplines (Interdisciplinary studies and Educational Technology).

**Table 9: Professional status of *JELIS* authors for selected years from 1984-2004**

Year	LIS faculty	Librarian-Practitioners	Others
1984	9	2	4
1994	14	3	8
2004	21	5	8
All 3 years	44 (61%)	11 (15%)	17 (24%)

*JELIS* continued to be supportive of authorship from foreign countries and in keeping with other social science disciplines is slowly exhibiting an increase in collaborative authorship; there's been a gradual evolution from reporting news and research to research about education in LIS only. These three were assumed to reflect values; that is, they are value characteristics. Three corresponding bibliometric measures, journal attraction power, author associativity, and journal consumption factor, are used to chart the value of *JELIS*. Affinity reflects the value of scholarly communication about LIS education on a global scale; associativity represents the collaboration of authors in educational research for the information disciplines, and consumption the popularity and citation factors of the journal from both its own and other scholarly journals different perspectives.

Consumption was also a correlate for deans prestige ratings (Kim, 1991), further

justifying its choice. Table 10 provides a quick definition of these measures and a detailed section on them follows.

**Table 10: Definitions of bibliometric measures of value**

Bibliometric Measures	Definition
Journal Affinity	$\frac{\text{Total number of foreign authors for a given period}}{\text{Total number of authors for a given period}}$
Journal Associativity	$\frac{\text{Total number of articles for a given period}}{\text{Total number of authors for a given period}}$
Journal Consumption	$\frac{\text{Citations}}{\text{References}} \times \frac{\text{Citing Journal}}{\text{Cited Journal}}$

Attraction power of the journal is “the portion of articles that the journal publishes by authors outside the country, language, or organization usually associated with the journal.” (Diodata, p. 4). Arvainitis and Chatelin (1988) calculated the attraction power of journal published in northern nations to authors who lived in the southern countries as the proportion of articles produced by foreign authors in the total of articles published in the journals of a given country. This can be modified to calculate only the proportion of foreign authors to total authors in a single journal as a measure of *journal affinity*:

$$\frac{\text{Total number of foreign authors for a given period}}{\text{Total number of authors for a given period}}$$

It can also be expressed thus:  $\frac{\sum_{k=1}^m F_k}{\sum_{k=1}^m N_k}$  where  $F_k$  is the number of foreign authors in the  $k$ -

th article and similarly  $N_k$  is the number of authors in the  $k$ -th article, and  $m$  is the total number of articles in the given period for the collection.

Example:

$$\text{Journal affinity} = \frac{15 \text{ foreign authors for 1995}}{30 \text{ authors for 1995}} = 0.5$$

As can be seen, a collaboration between a local author and a foreign author is also accommodated in the calculation. One can also say that *journal affinity* for a given period is the *probability* for an author, who is taken at random from the set of authors who published with the journal in question during the given period, to be a foreign one.

Associativity is defined as “the mean number of authors per document in a group of documents.” (Diodata, p. 4). Chatelin and Arvanitis (1992) in their study of structural indicators in the science production of Cote d-Ivoire use author associativity to show differences between subject areas and within subsets of the broad subjects or disciplines.

Author associativity is related to multiple authorship and collaboration. Multiple authorship is when an article has three or more authors and co-authorship is when the article has exactly two authors. Associativity, however, differs from straightforward authorship counts because it is an average taken over all articles. Again, like co-authorship, the term collaboration is often used synonymously for multiple authorship but

it differs. It refers to the broader concept of two or more researchers (or researchers from two or more organizations or countries) working together. Joint authorship is often taken to be an indicator and measure of collaboration although there are other measures too.

Here's how journal associativity can be defined and calculated:

Let us say that during a given period, a total of  $m$  articles were published ( $A_1, A_2, \dots, A_m$ ). Let us also say that the number of authors who have co-authored article  $A_k$  (where  $k$  ranges from 1 to  $m$ , of course) is  $N_k$  (again:  $k$  ranges from 1 to  $m$ ).

*Journal associativity*:  $\frac{\sum_{k=1}^m N_k}{m}$ , where  $N_k$  is the number of authors in the  $k$ -th article,

and  $m$  is the total number of articles in the given collection.

For example, assume we have five (5) articles:  $A_1, A_2, A_3, A_4$ , and  $A_5$ . Assume also that  $A_1$  is co-authored by 3,  $A_2$  by 1,  $A_3$  by 5,  $A_4$  by 2, and  $A_5$  by 6 authors. Equivalently:  $N_1 = 3, N_2 = 1, N_3 = 5, N_4 = 2$ , and  $N_5 = 6$ .

Thus, *journal associativity* =  $\frac{3+1+5+2+6}{5} = \frac{17}{5} = 3.4$

Journal affinity and associativity are very similar concepts to the newer measures of collaboration such as internationalization and affinity indices and calculations that can be made and that has been demonstrated in the case of countries; collaboration between China and India by Arunachalam (2000) and among eleven countries in Asia (Arunachalam and Doss, 2000). These measures while they add to impact are not really

measures of impact but measures of other characteristics of a journal such as author affiliations and connections. Journal consumption factor, on the other hand, is a measure of impact and it is a combination of two characteristics of journal citations; the references made and the citations received. Diodata (1988) shows the calculation as a product of citation and popularity factors following Yanovsky (1991). The terminology and calculation were modified. Assume we are calculating the *consumption factor* for journal A, and measure the following:

**A** = # of citations received by articles in journal A (citations)

**B** = # of **references** made by articles in journal A (references)

**C** = # of journals that cite articles in journal A (citing journals)

**D** = # of journals **referenced by** articles in journal A (cited journals)

$$\text{Journal consumption factor} = \frac{\text{Citations}}{\text{References}} \times \frac{\text{Citing Journals}}{\text{Cited Journals}} = \frac{A}{B} \times \frac{C}{D}$$

Todorov and Glanzel (1988) note that the journal impact and consumption factors have been shown to be statistically independent; that is, each measures a distinct and different journal attribute. Yanovsky (1981) calls consumption a “synthetic index characterizing the relative significance of journals... it more fully and precisely indicates the role of a given journal in the information flows because it takes into account both the self-evaluation of the journal and its evaluation by other journals.” (p. 230).

Journal affinity and associativity were calculated for four different years of *JELIS*: 1984, 1985, 1994, and 2004 and consumption for three years, 1984, 1985, and 1994. The results are shown in Table 11.

**Table 11: Bibliometric measures of value calculated for *JELIS* and rating rank\***

Year	J. Affinity	J. Associativity	J. Consumption	IF	Rating Rank
1984	0.07	1.50	0.03	N/A	N/A
1985	0.05	0.80	0.08	N/A	#5
1994	0.36	1.22	0.02	0.24	#5
2004	0.37	1.52	N/A	N/A	#12

\* The rating ranks are extracted from the LIS journals subjective ratings studies discussed.

In 1984, the journal affinity was 0.07 – only one author out of a total of 15 authors was from a foreign country. It should be emphasized that for the purposes of this calculation Canada and US were considered local, all other countries foreign. In 1985, the affinity was 0.05 – again, only one author out of a total of 20. Ten years later, in 1994 the journal affinity had increased to 0.36 – there were eight foreign authors out of a total of 22. Another ten years later, the journal affinity was 0.37 - showing that 13 of 35 authors came from foreign countries. Journal associativity in 1984 was 1.5 falling in 1985 to 0.8 – 20, increasing in 1994 to 1.2 , and in 2004 to 1.521 (35 authors for 23 articles). Journal consumption for 1984, 1985, and 1994 are as follows: 0.03, 0.08, 0.02 and is discussed below. Table 11 shows the overview for these values and summarizes the IF and the rating of the journal.

Recall that the consumption factor reflects popularity as well as citation. Kim (1991) calculated consumption factors of 0.33 for LIS research journals and 0.52 for practitioner journals (p. 31) and Yanovsky (1981) calculated 0.029 for *JASIS* (p. 230). The *JELIS* consumption factor is fluctuating across the years and this is not unusual. But since the data for all years is not available it is meaningless to speculate whether consumption is rising or falling. It is more revealing to examine the components of consumption.

In 1984 the popularity factor was 0.14 and by 1994, it was 0.05. One explanation for this could be the loss of librarian-practitioners as author-readers of *JELIS*. By becoming more scholarly, as exhibited by the increase in the references per paper during this period, and by focusing on education for the information professions more broadly conceptualized than just librarianship, as shown by the changed diversity in subject coverage, *JELIS* may have alienated and lost a part of a critical mass of reading audience in the United States. Simpler explanations are also possible; the serials price crisis in the US might have triggered a cut. Similarly, when individual components contributing to the consumption factor are examined qualitatively, we can find the top journals citing *JELIS*. Arranged in descending order of rank (times they cite *JELIS*) the titles are *Library and Information Science Research*, *Library Trends*, *Journal of the American Society for Information Science and Technology*, *Library Quarterly*, *College & Research Libraries*, *Education for Information*, *Library Resources & Technical Services*, *Journal of Academic Librarianship*, *Libri*, and the *Annual Review of Information Science and Technology*. All of these journals with the exception of *JELIS* and *Education for*

*Information* are ISI-ranked journals. These same journals are also some of the top journals that receive citations from *JELIS* authors. News and practitioner publications such as *American Libraries*, *Wilson Library Bulletin*, *Library Journal*, do not form a large part of the references in *JELIS*. At the other end, highly specialized journals in areas as diverse as Education and Education Research, Computer Science, Information Systems, Computer Science, Cybernetics, Psychology (Multi-disciplinary), History and Philosophy of Science are citing *JELIS*. These titles include *Abdominal Imaging*, *Journal of Experimental Imaging*, *Psychological Bulletin*, *International Journal of Engineering Education*, *Teaching and Learning in Medicine*, *Journal of Educational Computing Research*, etc. One cannot help wondering what role, if any, *JELIS* is serving in these communities. Clearly, educational research, by its very nature, is a multi-disciplinary endeavor, as is education for the information professions (health informatics, bio-informatics, engineering informatics, etc.). Multi-disciplinary journals that are also highly specialized can serve as boundary objects, stimulating new ideas and building cohesion among fragmented communities (Ackerson and Chapman, 2003). Investigating these values as bibliometric measures would be a meaningful addition that improves the current consumption factor and adds new dimensions.

### **Conclusion:**

It is promising that in terms of values such as affinity, associativity, and consumption *JELIS* appears to be in a holding pattern even exhibiting a slight tendency or slow show of improvement. A few of the practical implications of these findings are as follows:

1) *JELIS* editorial board needs to reflect the value of affinity by having members from different countries;

2) Outreach and marketing to constituencies beyond the scholarly society-publisher ALISE will help increase associativity. For example, Information System departments, societies, and multi-disciplinary research centers which are also engaged in teaching/research that impact the information professions should be explored. They may also have a stronger culture of research collaboration than the humanities-based library science and it might be worthwhile to tap them as both authors and readers of *JELIS*.

3) A correlation study along with a readership survey of *JELIS* and the other top five or top ten LIS journals in the citing journal network may reveal the finer gradations of popularity versus citation and contribute to a deeper understanding of value.

4) A comparative study of *JELIS* with educational and psychology journals may expand understanding of the significance of cross-subject or cross-disciplinary information flows based on which other bibliometric value measures can be developed.

Garfield, ISI, and many other scholars have always been careful to highlight all the disadvantages of relying upon the journal impact factor alone as an evaluation of a journal. Impact of a journal should not be confused with impact of an article or author; even something as small as a title change affects the impact factor (Garfield, 1994).

There have also been many studies that show self-citations tend to be higher in specialized journals (Garfield, 1974a; Garfield 1974b). However, in a society that values

rankings it becomes difficult to understand subtle differences among journals. Three bibliometric indicators journal affinity, associativity, and the consumption factor, have been used to demonstrate the measurement of a journal's value beyond the traditional impact factor. Findings from journal evaluation studies have been used to show why a composite, multi-dimensional rubric of journal value is needed. *JELIS* is a specialized journal focusing on a narrower subject – education – of multi-disciplines/professions namely, information science/studies. While the impact factor of the journal, as calculated by *JCR*, continued to fall, perceptual ranking studies of *JELIS* by the deans and faculty of LIS schools continued to rate it highly. Similarly, while the self-citation rate of *JELIS* is also high, probably attesting to its nature as a narrowly focused journal, articles appearing in *JELIS* appear to be cited in a wide variety of other journals. Finally, *JELIS* attracts a high percentage of its authors from beyond the organization and the country in which it is located. It is also beginning to exhibit the collaborative authorship model of big science.

Understanding specialized and multi-disciplinary journals in terms of value, and using other quantitative indicators besides impact is critical and this paper has outlined some first steps towards such an understanding. The discussion of how bibliometric measures can be converted into benefits ratios for a final calculation or numeric reporting of value is beyond the scope of this paper but is recommended in order to develop a rich theory of journal value that can both explain and predict the role of the scholarly journal in the communication system. Other areas are also open for future investigation. For example, Esteibar and Lancaster (1992) have argued for the inclusion of “curriculum-relatedness” (appearance in course reading lists) and “exclusivity” (i.e. proportion of content devoted

to a particular topic) in journal ratings. In the interests of keeping the assessment of journal value doable, these measures were not explored but subsequent studies may do so.

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