

Statistical Analysis of Library and Information Science (LIS) Journals of Asiatic Region during 2006-2015: A Study Based on SCImago Journal and Country Ranking

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Abstract

This article concentrates on the inferential statistical analysis of H-index and SCImago Journal Rank (SJR) rank of 10 Library and Information Science (LIS) journals of Asiatic region as appeared in SCImago Journal and Country Rank databases for the period of 2006–2015. It also analyzes the citations, self-citations and citations without self-citations of six countries publishing these 10 LIS journals in Asiatic region. The mean rank of these 10 LIS journals among the Asiatic region during the period is also discussed in the article. The statistical test applied throughout the study is Kruskal-Wallis H-Test (nonparametric).

Keywords: LIS Journals, H-index, SCImago Journal and Country Rank, Citations, Self-citations, Ranking of LIS Journals, Statistical Analysis

Introduction

Journals in Library and Information Science (LIS) discipline play a vital role in the dissemination of the research communication among LIS professionals. Ranking of LIS journals is now the major criteria for evaluating the quality of articles published in these journals. There are various journal ranking systems available online for evaluation and different aspects of the journals are subjected to ranking by each of these ranking systems. Based on the information in Scopus database, scholarly journals and the nations' scientific productivity indicators were developed SCImago. It is now publicly available through their portal. The productivity related

to various scientific disciplines can be assessed and evaluated by using the aforementioned indicator. The portal facilitates for the separate comparison of journals and country rankings. The present study is intended to statistically analyze the H-index and SCImago Journal Rank (SJR) of LIS journals of Asiatic region during the period of 2006–2015. The study also analyzes statistically the citations, self-citations and citations without self-citations of Asiatic region during the period of 2006–2015.

H-index and SCImago Journal Rank (SJR)

In the year 2005, H-index developed by Jorge E. Hirsch for quantifying the research output of an individual researcher. Hirsch's H-index was suggested as a substitute to other bibliometric indicators such as citations per article. It is established on a scientist's lifetime citedness, which includes yield as well as citation impact (an all-in-one metric).⁵ Now, it is applied for assessing the scientific productivity of research and academic institutions and organizations, countries, etc., across the world. The author-level metric output and citation impact of the publications of a scientist or scholar are calculated with the support of H-index. The most cited articles and the number of citations that scientist have received in other publications is on the basis of H-index. The productivity and impact of a scholarly journal are measured by H-index.²

SJR is a calculation of scientific inspiration of scholarly journal that accounts for both the number of citations acknowledged by a journal and the significance or

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reputation of the journals where such citations originates.³ It states the average number of weighted citations received in the particular year by the documents published in the selected journal in the three previous years, – i.e. weighted citations received in year X to documents published in the journal in years X-1, X-2 and X-3. The SJR indicator, which is enthused by the Page Rank algorithm, was developed for enormous and heterogeneous journal citation networks. The algorithm developed by SCImago is based on the widely known algorithm, Google Page Rank.¹

Citations, Self-Citations and Citations without Self-Citations

Citations are important and expected component of scholarly communication. All substantive citations can be assigned to one of three large categories depending on whether their primary function is: 1. linking the current work to past relevant work; 2. providing credit and paying honor; or 3. providing supporting suggestions and interpretations.⁷ Self-citation is one of the challenging subjects in scientific evaluation or citation analysis. Self-citation is a usual process but this cannot be ignored in citation analysis. Journal self-citation is the giving of reference to articles published in a certain journal. In other words, a journal cited from an earlier publication in the same journal is known as journal self-citations. This phenomenon can be seen either positively or negatively.⁸ Citations without journal self-citations are computed by excluding citations that come from articles published in the same journal.

Literature Survey

Review of literature gives an overview of major studies conducted on the topic as well as related field.

Journal Citation Report (JCR) is the oldest and most important database of journal's assessment. In the year 2015, a study conducted by Motamedi F discloses that the key objective of this study was to define the IF ranked in JCR database compare with the SJR ranked in SCImago database during a 3-year period from 2012 to 2014. This comparative cross-sectional study was conducted on 38 LIS journals using scientometric method and the data were collected from Thomson Reuters and

Scopus databases. According to the findings, there was a positive correlation between the values of IF and SJR in LIS journals indexed in Scopus and Thompson Reuters databases. In addition, there was a positive relationship between the ranking of these journals indexed in JCR and Scopus ($P < 0.05$). The result showed that it is necessary to use both of these ranking systems such as Scimago and SJR by the researchers of the arena of LIS.⁹

Jianjie Du (2013) reveals that an empirical research of H-index is judged in the LIS journals. The valuation matters consists of 19 kinds of LIS core journals from the *Journal of Library Science* in China using citation, H-index, and relative H-index. It evidenced that this journal has a top H-index, relative H-index, citation, and highest citation in the LIS core journals, and high-quality authors of highest citation. The articles in the journal have a high eminence and outstanding academic impact.¹⁰

In this article, Sadeghi Ramin & Alireza Saraff Shirazi (2012) explains about the predominant acceptance in the scientific world, impact factor (IF) has been evaluated recently on many accounts, including: the absence of quality valuation of the citations, impact of self-citation, English language bias, etc. In the present study, they assessed three indices of journal scientific impact: (IF), Eigen factor Score (ES), and SJR of nuclear medicine journals. Overall, 13 nuclear medicine journals are indexed in Institute for Scientific Information (ISI) and SCOPUS and 7 in SCOPUS only. Self-citations, citations to non-English articles, citations to non-citable items and citations to review articles contribute to IFs of some journals very flagrantly, which can be better detected by ES and SJR to some extent. Considering all three indices while adjudging quality of the nuclear medicine journals would be a better strategy due to several shortcomings of IF.¹¹

The persistence of this article is to compare the journal impact rankings of the open-access SCImago Journal & Country Rank (SJR) database and the subscription-based JCRs. Péter Jacsó (2010) looks at the SJR database, which deals crucial scientometric information for more than 17,000 scholarly and professional journals based on data licensed from Elsevier's Scopus database and compares this with the JCR database. The key judgments are open-access SJR database offers very informative new visions to counterpart those that have been provided by the JCR

for more than three decades by the ISI and its successor, the Thomson (later Thomson-Reuters) company. Mainly valuable are its features of weighting the citations received based on the prestige of the citing journals, the (partial) exclusion of journal self-citations, and the broader base of source journals. They provide new chances to analyses and understand their effects on the ranking of journals. The article provides useful information on the open-access SJR and JCR databases and their effects on the ranking of journals.¹²

Objectives of the Study

The study is based on SCImago Journal and Country Rank, the bibliometric indicator of journals and countries. The specific objectives of the present study are the following;

- To trace out whether there is significant difference among LIS journals from Asiatic region with regard to H-index during the period of 2006–2015
- To find out mean rank of LIS journals among Asiatic region during the period of 2006–2015
- To trace out whether there is significant difference among LIS journals of Asiatic region with regard to SJR during the period of 2006–2015
- To find out whether there is significant difference among countries of Asiatic region with regard to total number of citations, self-citations and citations without self-citations of their LIS journals during the period of 2006–2015

Methodology

The data for the present study were collected from SCImago Journal and Country Rank page. LIS journals from Asiatic region are selected for the present study. The number of countries and the LIS journals studied are 6 and 10, respectively. The countries and the journals under the present study are given in Table 1. The H-index, SJR of 10 LIS journals of Asiatic countries are subjected to analysis. The countries' total citations, self-citations and citations without self-citations in LIS journals are also statistically analyzed. The statistical test applied throughout the study is Kruskal-Wallis H-Test. This test works in the same way as the Mann-Whitney U-test and can be seen as an extension of that procedure. It is often described as a 'non-parametric' one-way ANOVA by ranks. It tests the null hypothesis that three or more samples have been

drawn the same population.⁶ The statistical software used for the present study is R Commander, free software.

R Commander

R commander is a free statistical software. R commander was established as an easy to use graphical user interface (GUI) for R. R is a freeware statistical programming language. Prof. John Fox developed the R commander to simplifying the teaching of statistics courses and removing the interruption of software complexity from the process of learning statistics. Among the existing R GUIs, RCMR together with its plug-ins is perhaps the most viable R-alternative to commercial statistical packages like SPSS. The package is highly useful to R novices, since for each analysis run it displays the underlying R code.⁴

Table 1: Countries and Their LIS Journals Studied

Country	Name of the Journal
India	Annals of Library and Information Studies (ALIS)
	DESIDOC journal of Library and Information Technology (DJLIT)
	Journal of Digital Information Management (JDIM)
China	Journal of Information and Computational Science (JICS)
Japan	Progress in Informatics (PRICS)
	Library and Information Science (LIS)
Malaysia	Malaysian Journal of Library and Information Science (MJLIS)
Taiwan	Journal of Educational Media and Library Science (JEMLS)
	Journal of Information Science and Engineering (JISE)
Pakistan	Pakistan Journal of Library and Information Science (PJLIS)

Analysis and Interpretations

Mean H-Index of LIS Journals of Asiatic Region During the Period 2006–2015

Taiwan LIS journal '*Journal of Information Science and Engineering*' has the highest average H-index during

the period of 2006–2015 followed by Malaysian LIS journal ‘*Malaysian Journal of Library and Information Science*’ and Chinese journal ‘*Journal of Information and Computational Science*’ having the H-index 14 each. ‘*Progress in Informatics*,’ Japanese LIS journal has the

H-index of 10. The H-indexes of other countries’ journals are below 10. Kruskal-Wallis Test shows that there is significant difference among LIS journals of Asiatic region with regard to H-index during the period 2006–2015 (p-value is $1.62e-13$ i.e.) (Table 2).

Table 2: Average H-index of LIS Journals of Asiatic Region During 2006–2015

Name of the Journal	ALIS	MJLIS	DJLIT	JISE	JICS	PRICS	JDIM	JEMLS	LIS	PJLIS
H-index	5	14	4	28	14	10	9	5	4	2
Chi-square	80									
P value	$1.62e-13$									

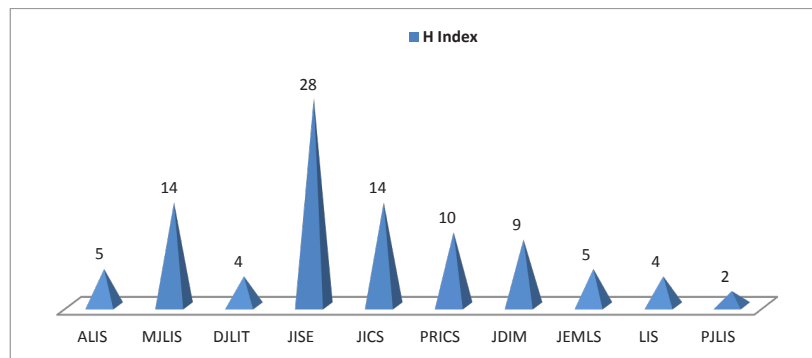


Fig. 1: Average H-index of Journals

Mean Rank of LIS Journals of Asiatic Region During the Period of 2006–2015

Malaysian LIS journal ‘*Malaysian Journal of Library and Information Science*’ has the highest average rank of 1 during the period of 2006–2015 followed by the Indian LIS journal ‘*Annals of Library and Information*

Science’ and Taiwan LIS journal ‘*Journal of Information Science and Engineering*’ having the mean rank of 2 each. Indian LIS journal ‘*DESIDOC journal of Library and Information Technology*’ and Japanese LIS journal ‘*Progress in Informatics*’ share the mean rank of 4 each. Other LIS journals’ mean ranks are 5 and below 5 (Table 3).

Table 3: Mean Rank of the Journals During the Period 2006–2015

Name of the Journal	ALIS	MJLIS	DJLIT	JISE	JICS	PRICS	JDIM	JEMLS	LIS	PJLIS
Mean Rank	2	1	4	2	5.5	4	5	6	7	8

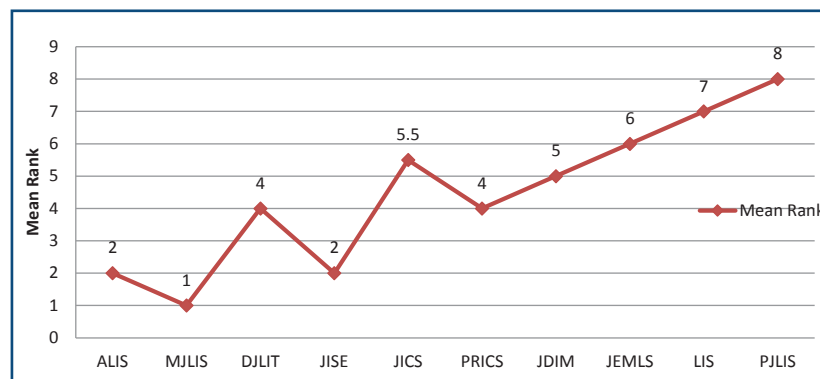


Fig. 2: Mean Rank of Journals During 2006–2015

Mean SJR of LIS Journals of Asiatic Region During the Period 2006–2015

Indian LIS journal ‘*Annals of Library and Information Science*’ has the highest SJR value of 0.3085 followed by Malaysian LIS journal ‘*Malaysian Journal of Library and Information Science*’ having the SJR value of 0.2835. Taiwan LIS journal ‘*Journal of Information Science and*

Engineering’ and Indian journal ‘*DESIDOC journal of Library and Information Technology*’ have the SJR values, 0.2415 and 0.2290, respectively. Other journals’ SJR values lie below 0.2. (Table 4). The statistical test shows that there is significant difference among LIS journals of Asiatic region with regard to SJR during the period of 2006–2015. Here, p-value is 1.23e-05 (Table 4).

Table 4: Mean SJR of Journals During the Period 2006–2015

Name of the Journal	ALIS	MJLIS	DJLIT	JISE	JICS	PRICS	JDIM	JEMLS	LIS	PJLIS
Mean SJR	0.3085	0.2835	0.2290	0.2415	0.1505	0.1790	0.1380	0.1315	0.1120	0.1040
Chi-square	38.849									
P value	1.23e-05									

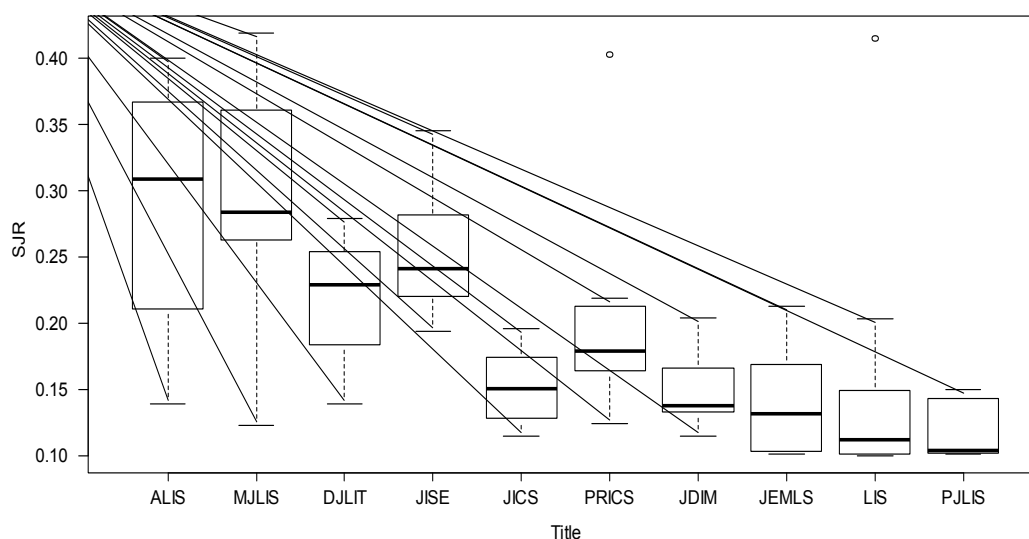


Fig. 3: Mean SJR of Journals During the Period 2006–2015

Average Total Citations of Asiatic Countries in their LIS journals during the period 2006–2015

China has the highest average number of citations (2154.5) for their only one LIS journal (JICS) during the period of study followed by Taiwan (1430.5) in their 2 LIS journals JISE and JEMLS. India occupies the third position in respect of average number of total citations (943) through their 2 LIS journal ALIS and DJLIT. Japan has 524.5 average numbers of citations in their 2 LIS journals

(PRICS and LIS). In Malaysia, there is only one journal MJLIS that has got 242 mean number of total citations. The lowest average number of total citations during the period goes to Pakistan through their LIS journal PJLIS. The statistical test shows that there is significant difference among countries of Asiatic region with regard to the average number of total citations received through their respective LIS journals. (p value is 2.12e-06) (Table 5).

Table 5: Mean Number of Total Citations of Asiatic Countries of LIS Journals During the Period 2006–2015

Country	China	India	Taiwan	Japan	Malaysia	Pakistan
Mean Total Citations	2154.5	943	1430.5	524.5	242	90
Chi-square: 34.258						
P value: 2.12e-06						

Average Number of Self-Citations of Asiatic Countries of LIS Journals during the period 2006–2015

In the same way as above, China positions first with the value 1140.5 followed by Taiwan (378.5). India occupies

the third position with 253.5 numbers of self-citations followed by Japan, Malaysia and Pakistan. The result shows that there is significant difference among countries of Asiatic region with regard to average number of self-citations during the period of 2006–2015 (p-value 5.23e-07) (Table 6).

Table 6: Mean Number of Self-Citations of Asiatic Countries of LIS Journals during the period 2006–2015

Country	China	India	Taiwan	Japan	Malaysia	Pakistan
Mean Total Citations	1140.5	253.5	378.5	151	72	21
Chi-square: 37.295						
P value: 5.23e-07						

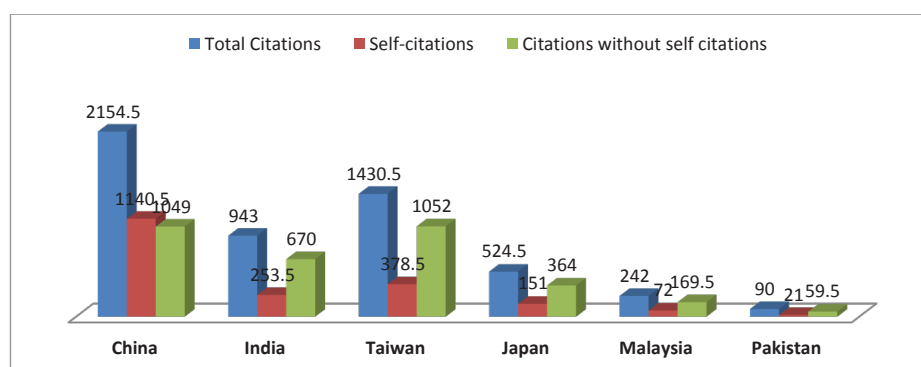
Average Number of Citations without Self-citations of Asiatic Countries of LIS Journals during the period 2006–2015

In the case of average number of citations without self-citations, China positions top with 1,049 citations without

self-citations followed by Taiwan, India, Japan, Malaysia and Pakistan, respectively (Table 7). The study shows that there is significant difference among countries of Asiatic region with regard to citations without self-citations of LIS journals during the period 2006–2015 (p value 1.281e-05).

Table 7: Mean Number of Citations without Self-Citations of Asiatic Countries of LIS Journals During the Period 2006–2015

Country	China	India	Taiwan	Japan	Malaysia	Pakistan
Mean Total Citations	1049	670	1052	364	169.5	59.5
Chi-square: 30.31						
P value: 1.281e-05						

**Fig. 5: Country Wise Citations, Self-Citations and Citations Without Self-Citations During the Period 2006–2015**

Findings

From the aforementioned statistical analysis, the following findings are arrived at:

Taiwan LIS journal '*Journal of Information Science and Engineering*' has the highest average *H-index* (28) during the period of 2006–2015. There is significant difference among LIS journals of Asiatic region with regard to *H-index* during the period 2006–2015.

Among the Asiatic region countries, Malaysian LIS journal '*Malaysian Journal of Library and Information Science*' has the highest average rank of 1 during the period of 2006–2015. Indian LIS journal '*Annals of Library and Information Science*' positions second among the Asiatic region countries.

Indian LIS journal '*Annals of Library and Information Science*' has the highest SJR value of 0.3085 followed by Malaysian LIS journal '*Malaysian Journal of Library and Information Science*' having the SJR value of 0.2835. There is significant difference among LIS journals of Asiatic region with regard to SJR during the period of 2006–2015.

Chinese LIS journal's citations, self-citations and citations without self-citations are extremely high when compared with that of other countries of Asiatic region during the period 2006–2015. There is significant difference among countries of Asiatic region with regard to average number of citations, self-citations and citations without self-citations during the period of 2006–2015.

Conclusion

There are many LIS journals both in print and electronic form published from Asiatic region in the world. But the SCImago Journal and Country Rank covers only 10 LIS journals from the Asiatic region, this is the major drawback of this study. The covered journals in LIS discipline from the Asiatic regions are the most prestigious and reputed journals in their respective country. Such types of journal ranking systems will enable LIS professionals and research scholars in publishing their valuable research articles in the most prestigious and reputed LIS journals. From the journals' point of view, these ranking enables to attract more and better quality research article submissions.

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