Asian Journal of Multidisciplinary Studies

ISSN: 2321-8819 (Online)
2348-7186 (Print)
Impact Factor: 1.498
Vol.4, Issue 6, May 2016

Knowledge inflow in Library and Information Science in India: a case study of Library Herald

Atanu Das[1] and Udayan Bhattacharya[2]

[1]Librarian, Vivekananda College for Women, Kolkata-700008
[2]Professor, Department of Library and Information Science
Jadavpur University, Kolkata-700032

Abstract: *This study determined the knowledge inflow in library and information science publications in Indian. Citation analysis and co-author(s) academic background study was done by the authors to analyzed articles published in Library Herald during 2005-2014. Total 220 articles contributed by 371 scholars with 2662 references were studied and it was found that journals were most referred documents, 33 major disciplines has influenced on LIS, education was the most influencing discipline on LIS based on co-authorship study and citation counting analysis.*

Keywords: cross-domain citation, cross-disciplinary collaboration, disciplinary influence, extradisciplinarity, information inflow, knowledge inflow, multi-disciplinary, subject input

1. Introduction

The primary and important role of literature is to record and translate the ideas on discoveries, inventions, new technologies, etc. that brings advanced knowledge. As most of the research output and original findings or new application of existing knowledge are reported in periodicals, a number of periodicals in library and information science (LIS) were started in India by various library associations, university departments, individual professional luminaries, and learned bodies (Singh & Panda, 2002). LIS scholars written their research findings and were subsequently published and cited in journals articles relevant to the research interests of their field. Borkor (1968) observed that information science is an interdisciplinary science derived from and related to such fields as mathematics, logic, linguistics, psychology, computer science, operation research, graphic arts, communications, library science, management, and other similar fields. Researchers have collaborated with one another for many years. Now a days, researchers are produces collaborative works belonging to more than one discipline.

Library and information science have developed out of multidisciplinary collaborations. The importance of interdisciplinary research is widely accepted and cross-disciplinary initiatives are promoted through national and international programs. However, there are no appropriate indicators to measure interdisciplinarity of any discipline (Morillo, Bordons & Gomez, 2001). Although citing literature from different disciplines and the co-authorship of researchers from different disciplines are common ways to determine interdisciplinary information transfer (Pierce, 1999). In bibliometrics, links between research areas or topics have been analyzed through the "maps of science", especially those based on co-word analyses (Tijssen, 1992), or through the flow of citations among fields (Porter and Chubin, 1985; Urata, 1990; Tomov and Mutafov, 1996). Interdisciplinarity in publications was also analayzed through the collaboration between researchers from different disciplines (Qiu, 1992), whilst collaboration itself was found to be associated to higher interdisciplinarity in some disciplines (Qin, Lancaster & Allen, 1997).

2. Objectives of the study

The objective of the study is to find the answers of the following research questions.

- What is the academic background of the contributors?
- What is the quantity of disciplinary collaboration?
- From which disciplines did the co-authors are contributed in *Library Herald*?
- What type of documents was cited by the researchers?
- What are the disciplines contributed to LIS field?

3. Literature Review

Influence of various disciplines on LIS field was tested after considering different sample journal from the long days back. Al-Sabbagh (1987) analyzed references in the articles published in the *Journal of the American Society for Information Science* (JASIS) from 1975 to 1985 and found that the cited publications came from a

variety of disciplines. The publications on computer science, library science and science in general were cited most frequently. It was observed that the percentage of computer science citations has increased and the percentage of library science citations has decreased. Tsay (2008) also studied the relationship between information science and other disciplines via citation analysis and examined the publications in *Journal of the American Society for Information Science and Technology* (JASIST) in 1980, 1985, 1990, 1995, 2000, and 2004. She found that the cited journals came from various disciplines, about half of which in the field of LIS, followed by science (22.7%) and social sciences (6.3%).

Baradol and Kumbar (1998) reported that the subject librarianship has relationship with twenty-nine other subject disciplines after studying *Advances in Librarianship*. Das and Bhattacharya (2014) studied articles published in *IASLIC Bulletin* during the year 2008 to 2013 to identify the influence of different subject disciplines in LIS. They analyzed the cited journals and cited books and found that 15 subject descriptor of cited journals and 26 subject descriptors of cited books. They also calculated the Karl Pearson's coefficient of correlation, which was 0.83 indicated strong relation between the LIS and non-LIS references. Fang and Xiangnv (2010) studied *Journal of the China Society for Scientific and Technical Information* (JOCSSTI) and found that the research methods applied in JOCSSTI trends more and more scientific, computer and information technology were the most adopted ones followed by informetrics and bibliometrics methods.

Again Borgman and Rice (1992) investigated the citation relationship between information and communication. They found little convergence between the two disciplines. Cheng (1994) analyzed 1,079 articles published in seven LIS journals published from Taiwan during 1974 to 1993, and concluded that LIS does not have interdisciplinary characteristics. Cited literature from different disciplines and the co-authorship of researchers from different disciplines are common ways of interdisciplinary information transfer (Pierce, 1999). In most of the cases, the citing authors do not interact with the cited authors. But in case of co-authorship work it involves more collaborative and interactive relation than citing-cited relation.

The relationship of co-authorship implies that at least two authors are willing to create a paper together. Before publishing their co-authored paper, they may discuss and exchange ideas (Huang & Chang, 2011). Lipetz (1999) has analyzed JASIS and discovered that its rate of co-authored articles was 4.8% in 1955 but it increases to 32.4% in 1995. Chua and Yang (2008) studied multi-disciplinarity in information science during 1988-2007 and found that cross-disciplinariy co-authors pairs have become more prevalent. Qiu (1992) has analyzed co-authored articles in 24 LIS journals and only indicated that LIS researchers collaborated with researchers from 10 disciplines outside LIS.

4. Methodology

4.1 Journal selection

The *Library Herald* is selected as source journal to study the current research. The *Library Herald* is a quarterly peer reviewed journal published by Delhi Library Association. It was first published in April 1958. This journal published original contributions in the field of library science and services, review of Indian and foreign publications and includes research reports. Special issues on various aspects of library and information science are also published from time to time. The journal is indexed in Library Literature, Library and Information Science Abstracts, Guide to Indian Periodical Literature, Indian Library Science Abstract and Index India. It is one of the oldest journals in India in the field of Library and Information Science (Singh & Bebi, 2014) and now it is available online.

4.2 Data collection

In this study, only the scholarly writings were considered published between 2005 and 2014 in the *Library Herald*. Other publications such as reminiscences, footnote, editorials, obituaries, book review, letters to the editors etc. were excluded for this study purpose. All the requisite data were collected from the source articles and recorded in MS Office-Excel 2007 spread sheet and sorted accordingly.

4.3 Data analysis

This study analyzed the collected data according to the research questions. Analysis includes Authors' academic background, study of cited journals, cited books, cited conference proceedings, and cited theses/dissertations.

The disciplines of the authors were determined according to the institutional affiliation mentioned in the articles. In few cases affiliated institution's database was search to find the author's academic background. The discipline of each reference was determined by the retrieval of Dewey decimal classification (DDC) number from the selected database(s). Dewey decimal class number of each cited journals were collected from the *Ulrich's Periodical Directory.*

The DDC class numbers of the cited books were collected from the OCLC Classify-an experimental classification service (classify.oclc.org) database, online British Library integrated catalogue (www.catalogue.bl.uk) and subject descriptor was verified by the WorldCat.org: The World's Largest Library Catalog (www.worldcat.org). If the subject discipline of any cited books was not available in the said

database(s), then online National Library Book Database (www.nationallibrary.gov.in), and/or IndCat: Online union catalogue of Indian universities (indcat.inflibnet.ac.in) was searched to find the main class.

Conference publications were analyzed after searching WorldCat, British Libray Catalogue and IndCat database. Cited theses were first separated according to the awarded university. Then the main subject descriptor of the cited theses awarded in India were searched and collected from the Shodhganga Database (shodhganga.inflibnet.ac.in), a reservoir of Indian theses. British Library catalogue and WorldCat databases searched to identify the subjects of the cited theses awarded by the foreign universities. Once the class numbers were identified, the cited documents were arranged according to their subjects class based on DDC second summary.

5. Analysis and Interpretation

5.1 Total Publication and References

Total 220 articles were published in Library Herald during 2005 to 2014. There were two memorial volumes, one was 4th issue of the year 2009 in the name of Prof P.N. Kaula and other one was 3rd issue of the year 2012 in the name of Prof S. DasGupta. Total number of contributors was 371 and they referred 2662 documents during the study period. Table-1 shows the data regarding number of articles, contributors and total references.

Table-1: Total Contributions, Contributors and References

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Articles	14	28	27	21	18	27	24	15	22	24	220
Contributors	17	45	45	38	29	45	42	26	45	39	371
References	117	365	241	180	263	234	260	223	374	405	2662

5.2 Academic Background of the Authors

Table-2 shows that total 371 authors contributed in the *Library Herald* during the year 2005 to 2014. Most of the authors (94.34%) were from LIS field. It is clear from the Table-2 that there were 13 authors outside the LIS disciplines who made the contributions in *Library Herald*. Educationists are the most contributing authors in LIS field. Other contributors were from anthropology, computer science, law, management, and psychology. Few contributing authors' academic background was not possible to identify because the lack of requisite information.

Table-2: Authors Academic Background and Collaboration

Disciplines	Authors' Specialisation	LIS Collaboration	Non-LIS Contribution
Anthropology	01	01	-
Computer science	01	01	-
Education	06	02	04
Law	01	01	-
LIS	350	-	-
Management	01	01	-
Psychology	02	01	01
Public Administration	01	-	01
Unidentified	08	-	-
Total	371	07	06

Again seven contributions in *Library Herald* were cross-disciplinary collaboration between LIS professionals and others field of studies which were anthropology, education, computer science, management, psychology. Authors from non-LIS disciplines contributed six articles during the study periods. Educationist contributed four articles, and Public Servant and Psychologist contributed one article each in *Library Herald* during the study periods.

5.3 Types of Cited documents

Table-3 shows the types of documents cited in the *Library Herald* during the year 2005-2014. The contributors in *Library Herald* highly referred journals (48.16%) for their scholarly publications, followed by books/ book chapters (21.45%), web resources (15.44%), conference publications (6.65%), and theses/ dissertations (1.62%). Other documents that were consulted by the contributors include research proposals, reports, interviews, case studies, souvenir, newspapers articles etc.

Table-3: Type of Cited Documents

Types of Documents	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total	%
Journals	41	162	103	87	144	90	111	84	232	228	1282	48.16
Book/ Book chapters	49	102	59	45	43	54	67	54	44	54	571	21.45
Conference publications	03	28	06	05	19	36	14	18	33	15	177	6.65
Theses /dissertation	01	09	03	01	05	04	13	01	03	03	43	1.62
Web resources	12	49	46	17	34	27	48	56	50	72	411	15.44
Others	11	15	24	25	18	23	07	10	12	33	178	6.68
Total	117	365	241	180	263	234	260	223	374	405	2662	100

5.4 Distribution of Disciplines

Table–4 shows that LIS researchers mainly depend on LIS publications such as journals, conference publications and theses etc. But they also consulted non-LIS journal by 36.9%, non-LIS books by 50.44%, non-LIS conference publications by 6.78% and non-LIS theses by 32.56%. Top ten non-LIS disciplines that were cited by the contributors in *Library Herald* were education (7.72%), management (4.29%), science in general (3.38%), medical science (2.89%), computer science (2.80%), law (1.72%), sociology (1.50%), news media & publishing (1.35%), economics (1.21%), language & linguistics (1.21%). Education and medical sciences were only two non-LIS disciplines that cited in all types of studied documents. Agriculture, computer science, news media & publishing, psychology, science general, sociology were the non-LIS disciplines that contributed to LIS publications as represented in any three types of cited documents.

Table-4: Distribution of Disciplines

Disciplines	Journals	Books	Conferences	Theses	Total
Agriculture	05	07	-	01	13
Architecture	-	01	-	-	01
Art	01	-	-	01	02
Biology	01	-	-	-	01
Chemical engineering	02	-	-	-	02
Communication	02	05	-	-	07
Computer science	39	17	02	-	58
Economics	21	04	-	-	25
Education	112	40	06	02	160
Encyclopaedia	-	04	-	-	04
Engineering	06	01	-	-	07
Ethics	04	10	-	-	14
Geography & travel	01	01	-	-	02
History	03	06	-	-	09
Home management	-	02	-	-	02
Knowledge & systems	03	12	-	-	15
Law	10	26	-	-	36
Languages & Linguistics	01	24	-	-	25
LIS	809	283	165	29	1286
Literature	04	09	-	01	14
Management	40	49	-	-	89
Mathematics	01	-	-	-	01
Medical science	48	08	01	03	60
News media & publishing	19	08	01	-	28
Physics	01	-	-	-	01
Political Science	01	03	-	-	04
Psychology	20	08	-	01	29
Public Administration	02	-	-	-	02
Religion	04	08	-	-	12
Science-General	58	10	02	-	70
Social Science-General	20	04	-	-	24
Social problems & services	11	01	-	-	12
Sociology	16	14	-	01	31
Technology	08	01	-	-	09
Unidentified	09	05	-	04	18
Total	1282	571	177	43	2073

5.5 Subject descriptors of Cited Journals

Table-5 shows the citation frequency of LIS and non-LIS journals. Two-third of the total cited journals were from library science discipline and one-third journals were from outside of the LIS domain. The citation rate of non-LIS journals increases every year and Karl Pearson coefficient of correlation was 0.727.

Table-5: LIS and Non-LIS Cited Journals

Disciplines	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total	%
LIS Journals	23	101	56	65	117	69	70	49	138	121	809	63.55
Non-LIS Journals	18	61	47	19	27	21	41	33	91	106	464	36.45
Total	41	162	103	84	144	90	111	82	229	227	1273	100

Table–6 indicated the disciplines of the cited journals that are frequently cited by the contributors of *Library Herald* was education (8.74%), followed by science-general (4.52%), medical science (3.74%), management (3.12%), computer science (3.04%) etc.

Table-6: Subject Distribution of Cited Journals

Sl. No.	Subjects	Citation frequency	Percentage	Rank
1	Agriculture	05	0.39	15
2	Art	01	0.08	19
3	Biology	01	0.08	19
4	Chemical engineering	02	0.16	18
5	Communication	02	0.16	18
6	Computer science	39	3.04	6
7	Economics	21	1.64	7
8	Education	112	8.74	2
9	Engineering	06	0.47	14
10	Ethics	04	0.31	16
11	Geography & travel	01	0.08	19
12	History	03	0.23	17
13	Knowledge & systems	03	0.23	17
14	Law	10	0.78	12
15	Linguistics	01	0.08	19
16	LIS	809	63.10	1
17	Literature	04	0.31	16
18	Management	40	3.12	5
19	Mathematics	01	0.08	19
20	Medical sciences	48	3.74	4
21	News media & publishing	19	1.48	9
22	Physics	01	0.08	19
23	Political Science	01	0.08	19
24	Psychology	20	1.56	8
25	Public Administration	02	0.16	18
26	Religion	04	0.31	16
27	Science-general	58	4.52	3
28	Social problems & services	11	0.86	11
29	Social Sciences-general	20	1.56	8
30	Sociology	16	1.25	10
31	Technology	08	0.62	8
32	Unidentified	09	0.70	NA
	Total	1282	100	

5.6 Subject descriptors of the Cited Books

Table-7 show that researchers consultant equal quantity of books from LIS and outside of LIS domain i.e. 49.56% books were from LIS domain and 49.56% books were from non-LIS domain excluding unidentified books. Management (8.58%) books was the most cited discipline outside the LIS domain, followed by education (7.01%), law (4.55%), language and linguistics (4.20%), computer science (2.98%), sociology (2.45%), knowledge & systems (2.10%), and ethics (1.75%).

Table-7: Subject Distribution of Cited Books

Sl. No.	Disciplines	Citation frequency	Percentage	Rank
1	Agriculture	07	1.23	12
2	Architecture	01	0.18	18
3	Communication	05	0.88	14
4	Computer science	17	2.98	6
5	Economics	04	0.70	15
6	Education	40	7.01	3
7	Encyclopaedia-general	04	0.70	15
8	Engineering	01	0.18	18
9	Ethics	10	1.75	9
10	Geography & travel	01	0.18	18
11	History	06	1.05	13
12	Home management	02	0.35	17
13	Knowledge & systems	12	2.10	8
14	Language & linguistics	24	4.20	5
15	Law	26	4.55	4
16	LIS	283	49.56	1
17	Literature	09	1.58	10
18	Management	49	8.58	2
19	Medical science	08	1.40	11
20	News media & publishing	08	1.40	11
21	Political science	03	0.53	16
22	Psychology	08	1.40	11
23	Religion	08	1.40	11
24	Science-general	10	1.75	9
25	Social problems & services	01	0.18	18
26	Social sciences-general	04	0.70	15
27	Sociology	14	2.45	7
28	Technology	01	0.18	18
29	Unidentified	05	0.88	NA
	Total	571	100	

5.7 Main Class of Cited Conferences

Table-8 shows that most of the referred conference papers were from LIS disciplines (93.22%). Very few conference papers from non-LIS (6.87%) domain were referred by the researchers in *LH* during the study period. The main classes of cited conference publications were education (3.39%), computer science (1.13%), science in general (1.13%), and medical sciences and news media & publishing with 0.56% each.

Table-8: Subject Distribution of Cited Conferences

Sl. No.	Disciplines	Citation frequency	Percentage	Rank
1	Computer science	02	1.13	3
2	Education	06	3.39	2
3	LIS	165	93.22	1
4	Medical science	01	0.56	4
5	News media & publishing	01	0.56	4
6	Science	02	1.13	3
	Total	177	100	

5.8 Main Class of Cited Theses

Table-3 shows that the rate of theses/dissertation citation is 1.62% of total references. Researchers referred less number of thesis and dissertations from non-LIS field (32.56%) in *Library Herald* during the study period. Table-9 shows that out of 43 theses and dissertations, 67.44% belong to LIS field. Subject description of 4 theses was unable to identify as these were in Persian language and not covered in any selected database. Most of the non-LIS theses were from medical science (6.98%) and other disciplines were education, agriculture, art, literature, psychology, and sociology.

Table-9: Subject Distribution of cited Theses and Dissertations

Sl. No.	Disciplines	Total	Percentage	Rank
1	Agriculture	01	2.33	4
2	Art	01	2.33	4
3	Education	02	4.65	3
4	LIS	29	67.44	1
5	Literature	01	2.33	4
6	Medical science	03	6.98	2
7	Psychology	01	2.33	4
8	Sociology	01	2.33	4
9	Unidentified	04	9.30	NA
	Total	43	100	

6. Findings and Conclusion

The study of *Library Herald* reveals the following observations:

(1) Most of the contributing authors are from the LIS field. Authors from other field of studies include anthropology, computer science, education, management, psychology, public administration etc. and LIS researchers started to works with them.
(2) Non-LIS researchers also contribute their knowledge in LIS journal.
(3) Journals were the most cited documents, followed by books, web resources, conference proceedings, theses etc.
(4) Most of the cited journals were from LIS field but use of non-LIS journals articles increases year after year.
(5) Contributors of LH mostly referred to the books outside of their domain. Cross domain citation of books were from education, management, law, linguistics and language, computer science, ethics etc.
(6) Contributors in LH mostly consultant conference publications from their own domain i.e. LIS. Few non-LIS conference papers were also cited and they belong to computer science, education, news media and publishing, science-general disciplines etc.
(7) LIS researchers were referred to the theses and dissertation belongs to their own field of study and they also cited the theses of other disciplines such as agriculture, art, education, medical science, literature, psychology, and sociology.

This study has confirmed that LIS is more and more influenced by many others disciplines. It was found in this study that contributors of LH have cited publications from 34 disciplines. Researchers in LIS most frequently referred publications of LIS, followed by education, management, law, linguistics and language, computer science, and ethics. Academic background of the contributing authors was LIS. Though there was less collaboration between LIS and non-LIS researchers, but there were varieties of authors from different disciplines. The co-authors were from anthropology, computer science, law, management, and psychology disciplines. Again authors like educationist, public servant also contributed their knowledge in LIS domain which enriches the library and information science discipline. The quantitative data regarding co-authorship and references shows that library professionals tend to cite more publications from outside of their own disciplines and produces collaborative researches in diverse disciplines.

References

Al-Sabbagh, IA (1987). The evaluation of the interdisciplinarity of information science: A bibliometric study (Doctoral dissertation, Florida State University, Tallahassee, FL) Retrieved from ProQuest Dissertation & Theses database.

Borkor, H. (1968). Information science: What is it? *American Documentation*, *19*, 3-5.

Borgman, C. L., & Rice, R. E. (1992). The convergence of information science and communication: A bibliometric analysis. *Journal of the American Society for Information Science, 43*, 397-411.

Chua, A. Y. K., & Yang, C. C. The shift towards multi-disciplinarity in information science. *Journal of the American Society for Information Science and Technology, 59*, 2156-2170.

Das, A ., & Bhattacharya, U. (2014). Cross-domain citations in library and science publications: A case study of Iaslic bulletin. *RBU Journal of Library and Information Science, 16*, 8-14.

Fang, W., & Xiangv, W. (2010). A bibliometric study on research methods information science in China: Taking JOCSSTI (1999-2008) as example. Journal of the China Society for Scientific and Technical Information, 29(4), 652-662.

Huang, M. H., & Chang, Y. W. (2011). A study of interdisciplinarity in information science: Using direct citation and co-authorship analysis. *Journal of Information Science*, doi: 10.1177/0165551511407141

Lipetz, B. A. (1999). Aspects of JASIS authorship through five decades. *Journal of the American Society for Information Science, 50*, 994-1003.

Pierce, S. J. (1999). Boundary crossing in research literatures as a means of interdisciplinary information transfer. *Journal of the American Society for Information Science, 50*, 27-279.

Porter, A. L., & Chubinm, D. E. (1985). An indicator of cross-disciplinary research. *Scientometrics, 8*, 161-176.

Qin, J., Lancaster, F. W., & Allen, B. (1997). Types and levels of collaboration in interdisciplinary research in the science. *Journal of the American Society for Information Science, 48*, 893-916.

Qiu, L. (1992). A study of interdisciplinary research collaboration. *Research Evaluation, 2*, 169-175.

Singh, N., & Panda, K. C. (2002). Growth of LIS literature as reflected in ILA bulletin (1995-2001): A study. *ILA Bulletin, 38*(4), 118-122.

Tijssen, R. J. W. (1992). A quantitative assessment of interdisciplinarity structures in science and technology: Co-classification analysis of energy research. *Research Policy, 21*, 27-44.

Tomov, D. T., & Mutafov, H. G. (1996). Comparative indicators of interdisciplinairty in modern science. *Scientometrics, 37*, 267-278.

Tsay, M. Y. (2008). Journal bibliometric analysis: A case study on the JASIST. *Malayasian Journal of Library & Information Science, 13*, 121-139.

Urata, H. (1990). Information flows among academic disciplines in Japan. *Scientometrics, 18*, 309-319.