

*Webology, Volume 6, Number 1, March, 2009*

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## Citation Analysis of Library Trends

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*Received November 27, 2008; Accepted February 5, 2009*

### Abstract

*Citation analysis of all the journal articles published in the Library Trends from 1994-2007 is carried out. 593 articles are published in the journal during 14 years. Highest number (52) of articles is published in 2004. The Journal contained 15662 references for the study period of which 13783 are p-citations and 1879 are e-citations. Every issue published approx. 11 articles and each article has an average of 23.2 p-references and 3.1 e-citations. It was found that 44.51 % print books are consulted by the authors and 0% e-books are accessed. Authors have consulted 44.04% p-journals as against 11.82% e-journals. Figures shows that 88.14% other web references are used in the articles reference. Female contribution (52.34%) accounts more than male contribution (47.66%).*

### Keywords

*Citation analysis; Journals; Bibliometrics; Print-citations; Electronic-citations*

### Introduction

Periodicals are sensitive indicators of the emerging new ideas in any discipline. A careful evaluation of periodical literature may indicate a complete picture of the discipline. The present study has undertaken one of the renowned journal, [Library Trends](#) into consideration with an aim to analyze citations cited by various articles appeared in it. Citation analysis reveals interesting information about knowledge producers in terms their information seeking behavior and usage of various information sources. It can highlight the familiarity, awareness and usage of knowledge producers regarding the online and print information sources. Citation analysis examines the frequency, patterns and graphs of citations in articles and books ([Garfield](#), 1983).

Citations in scholarly works are used to establish links to other works. It is one of the most widely used methods of bibliometrics or it is an aspect bibliometrics, and studies reference to and from documents ([Gooden](#), 2001). The benefit of bibliometrics and citation analysis is expressed by ([van Raan](#), 2003) which is reinforced by the studies ([Lal & Panda](#), 1996;

[Aksnes](#), 2006) that have used this method of research enquiry to evaluate a library collection. The present studies choose *Library Trends* for citation analysis.

*Library Trends* is a quarterly journal issued in summer; fall, winter and spring by Graduate School, of Library and Information Science at the University of Illinois since 1952 edited by W. Boyd Rayward. It explores critical trends in professional librarianship. The journal is an essential tool, for both practicing librarians and educators in the professional development and continuing education.

The main objectives of this study are:

- to assess the authorship pattern;
- to estimate quantitative growth of articles by volume;
- to understand distribution of references by volume;
- to study the consultation frequency of print-citations or p-citations;
- to determine the consultation frequency of electronic-citations or e-citations; and
- to analyze the composition of citations.

## Literature Review

[Das & Sen](#) (2001) analyzed 1049 citations appended to 34 research articles of Journal of Biosciences; 2000. It was found that out of the total citations, journal articles comprises 85.89% and monographs 10.1%. [Ramesh & Nagaraju](#) (2000) analyzed the citations provided in articles of Indian journal of Information, Library and Society. 138 citing articles have cited 901 citations i.e. on an average 7 citations were cited per article. About 67.5% of articles had 1-20 citations. More citations were from the books and periodicals than the other type of materials. Similar type of study was performed by [Koley & Sen](#) (2003) covering 457 citations appended to 26 research articles published in the four issues of the quarterly Indian Journal of Physiology and Allied Sciences. Of the citations, 76.81% relate to journal articles, 18.59% to monographs, and the rest to conference papers, theses, etc.

[Rethlefsen](#) (2007) analyzed citation of journal articles authored by Minnesota Department of Health staff. Information on each cited reference was recorded, including reference type, relative age of citation, and journal name. Journals were the most heavily cited format (63%). [Bhat & Sampath Kumar](#) (2008) describes a citation analysis of research articles from scholarly electronic journals published in 2000-2006. The analysis focused on the extent to which scholars are using web-based sources in scholarly electronic journals. Results of the study shows that 81.49% of articles published in selected 9 electronic journals during 2000-2006 have web references. Out of 25,730 references 56.54 % of references are print journal references and 43.52% of them are web references. 437 citations in 32 research articles in two issues of the RMJ were collected by [Javed & Shah](#) (2008). The study revealed that 49.52 % citations pertained to journal articles and rest to other resource types. All the above studies except the last one reveals that journals are heavily cited and preferred source of information. In the above studies citations of journal articles were analyzed. Other studies have analyzed the citations of doctoral dissertations or masters' theses come up with the following results.

[Slutz](#) (1997) did a citation analysis of 16 Master's theses. Each citation from the 16 theses was analyzed along the following criteria: gender of citation author; format of citation (book, article within book, journal article, thesis, dissertation); and place of publication. Findings indicated that more male authored citations were utilized; most sources were books, articles within books, and journal articles. [Gooden](#) (2001) performed citation analysis of dissertations. The 30 dissertations studied generated a total of 3,704 citations. It was found that Journal articles were cited more frequently than monographs: 85.8% of the

citations were journal articles and 8.4% of the citations were monographs. A total of 4,012 citations in 70 postgraduate dissertations in education were studied by [Okji](#) (2003). Most students in education used more textbooks (60.3 per cent), than other forms of library materials. [Megnigbeto](#) (2006) studied the citations of dissertations of library and information science undergraduate students and found that the number of citations to Internet resources was very low.

## Methodology

The database of the present study comprises of 593 articles published in the journal from 1994-2007. The articles were accessed from [Find Articles](#) (website which provides access to articles previously published in over 3,000 magazines, journals, and other sources containing 11 million articles). Each articles published during the study period were examined. The references listed for each article were examined and duplicate references in each individual list were removed. Data concerning total number of articles, total number of references, total number of articles with electronic references, total number of print references were recorded along with the authorship pattern for each article. The gender of authors has been identified by looking at all the forename of the authors one by one. The collected data have been analyzed and is presented in the form of tables and figures as follows.

## Results and Discussion

### 1. Quantitative Growth of Articles by Volume

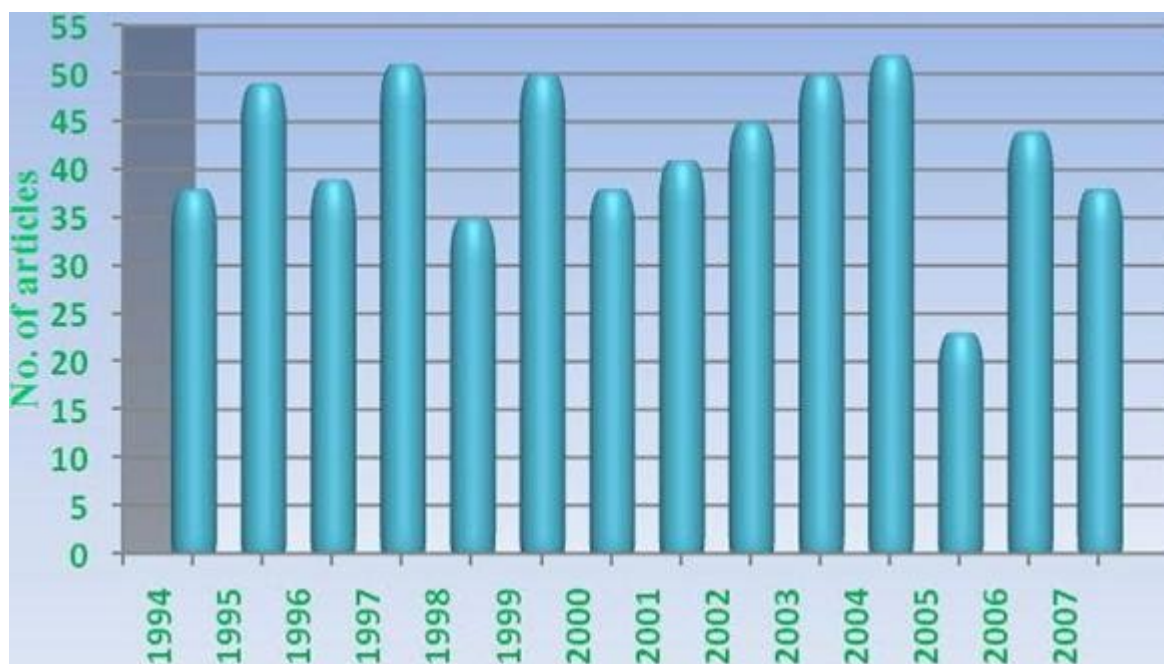
Table 1 shows the total number of articles published from 1994 to 2007. From 14 volumes or 56 issues of the journal under study, the total number of articles published is 593. The distribution of articles by volume shows that the number of articles is highest in 2004, with 52 articles. The range of articles published per year during the period under study is between 23 and 52. It is noted that same number of articles (38) got published in the year 1994, 2000 and 2007.

**Table 1. Frequency distribution of articles by volume**

Year	Volume*	No. of articles	Cumulative Total
1994	1	38	38
1995	2	49	87
1996	3	39	126
1997	4	51	177
1998	5	35	212
1999	6	50	262
2000	7	38	300
2001	8	41	341
2002	9	45	386
2003	10	50	436
2004	11	52	488
2005	12	23	511
2006	13	44	555
2007	14	38	593

\* Each volume consists of 4 issues

**Figure 1. Frequently distribution of articles by volume**



## 2. Distribution of citations by volume

The volume-wise distribution of references indicate that the fourteen volumes (56 issues) of the journal contained 15662 references of which 13783 are p-citations and 1879 are e-citations in 593 articles which means that every issue published approx. 11 articles and each article has an average of 23.2 p-references and 3.1 e-citations. Year wise analysis shows that the highest number of p-citations appeared in 2004 and least in 2005. Whereas e-citations are frequently cited in 2003 and least in 1996 (Table 2).

**Table 2. Distribution of citations by volume**

* Vol. No.	Year	No. of p-citations	No. of e-citations	No. of articles	Avg. no. of p-citations/ Article	Average no. of e-citations / Article	Total citations	Cumulative References
1	1994	747	9	38	19.6	0.23	756	756(4.8)
2	1995	1146	37	49	23.3	0.75	1183	1939(12.3)
3	1996	1658	4	39	42.5	0.10	1662	3601(22.9)
4	1997	899	75	51	17.6	1.47	974	4575(29.2)
5	1998	1054	43	35	30.1	1.22	1097	5672(36.2)
6	1999	1192	62	50	23.8	1.24	1254	6926(44.2)
7	2000	920	186	38	24.2	4.89	1106	8032(51.2)
8	2001	790	89	41	19.2	2.17	879	8911(56.8)
9	2002	961	144	45	21.3	3.20	1105	10016(63.9)
10	2003	944	322	50	18.8	6.44	1266	11282(72)
11	2004	1719	231	52	33	4.44	1950	13232(84.4)
12	2005	174	278	23	7.5	12.0	452	13684(87.3)
13	2006	818	273	44	18.5	6.20	1091	14775(94.3)
14	2007	761	126	38	20	3.30	887	15662(100)
Total		13783	1879	593	23.2	3.10	15662	15662(100)

Each volume consists of 4 issues (14\*4= 56 issues)  
 Numbers in parentheses indicate percentage.

**Figure 2. Distribution of citations by volume**



### 3. Composition of print-citations or p-citations

Table 3 indicates that the books are the preferred cited sources in the year 1995, 1996, 2004 with the highest percentage (56.64) in 1998. while as journals are cited most in the year 1994, 1997, 1999, 2000, 2001, 2003, 2005, 2006 and 2007 with highest percentage (63.57) consulted in 2002. Although journals over numbered the books and other sources in most of the years but aggregated figure shows the difference of books and journal citation is in decimal fraction. Largest numbers of conference proceedings are consulted in the year 1999 and least in the year 2007. No article consulted a Review from the year 1998-2002 and from 2004-2007.

**Table 3. Composition of p-citations**

p-citations							
Year	Total citations	Books	Journals	Conference proceedings	Reviews	Reports	Others*
1994	747	287 (38.42)	360 (48.14)	23 (3.2)	7 (0.9)	25 (3.3)	45 (6.04)
1995	1146	516 (45.02)	477 (41.62)	35 (0.03)	6 (0.52)	24 (2.09)	88 (7.6)
1996	1658	773 (46.62)	599 (36.13)	41 (2.47)	1 (0.06)	15 (0.90)	229(13.81)
1997	899	369 (41.06)	400 (44.49)	25 (2.78)	3 (0.33)	12 (1.33)	90 (10.03)
1998	1054	597 (56.64)	389 (36.92)	40 (3.79)	0	1 (0.09)	27 (2.56)
1999	1192	500 (41.94)	526 (44.12)	101 (8.47)	0	6 (0.57)	59 (4.9)
2000	920	340 (36.95)	440 (47.82)	38 (4.15)	0	20 (2.17)	82 (8.91)
2001	790	298 (37.72)	409 (51.77)	18 (2.27)	0	7 (0.88)	58 (7.36)
2002	961	308 (32.04)	611 (63.57)	33 (3.43)	0	9 (0.96)	0
2003	944	387 (40.99)	452 (47.88)	29 (3.07)	1 (0.13)	11 (1.16)	64 (6.77)
2004	1719	944 (54.91)	629 (36.59)	41 (2.38)	0	20 (1.16)	85 (4.96)
2005	174	47 (27.01)	94 (54.05)	20 (11.49)	0	2 (1.14)	11 (6.32)
2006	818	375 (45.84)	378 (46.23)	21 (2.56)	0	6 (0.73)	38 (4.64)

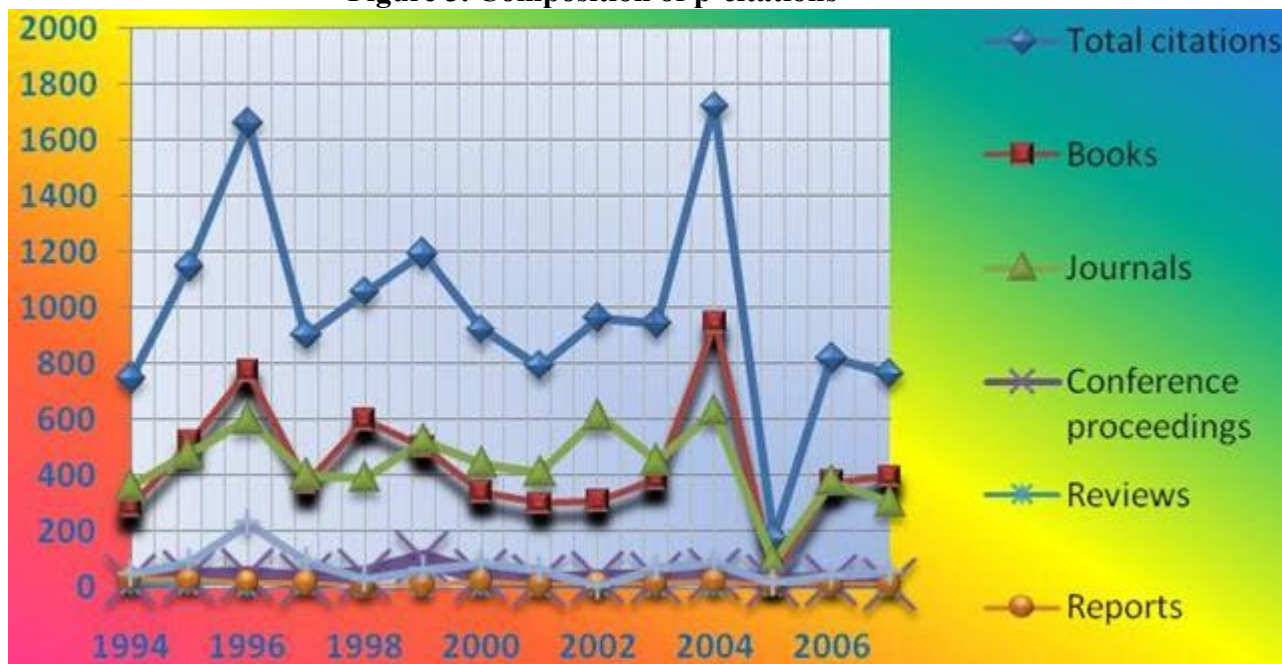


2007	761	395 (51.90)	302 (39.68)	7 (0.91)	0	6 (0.78)	51 (6.73)
TOTAL	13783	6136(44.51)	6066(44.04)	472(3.42)	18 (0.13)	164(1.18)	927(6.72)

Numbers in parentheses indicate percentage.

Others include Magazines, News paper Articles, Thesis and Dissertations, and Reference sources.

**Figure 3. Composition of p-citations**



### Composition of electronic-citations or e-citations

Table 4 reveals the reliance of author on e-resources. There is 0% usage of e-books by the researchers. Meager number 11.86% of e-journals are cited against 88.14% of other resource types during 14 years. 32% e- journals are cited in 1995 and 0% usage in the next consecutive year while as least percentage (2.77) is used in 2002. In 2007 only 10 e-journals are cited which accounts to only 8% of total citations during the said year.

**Table 4. Composition of e-citations**

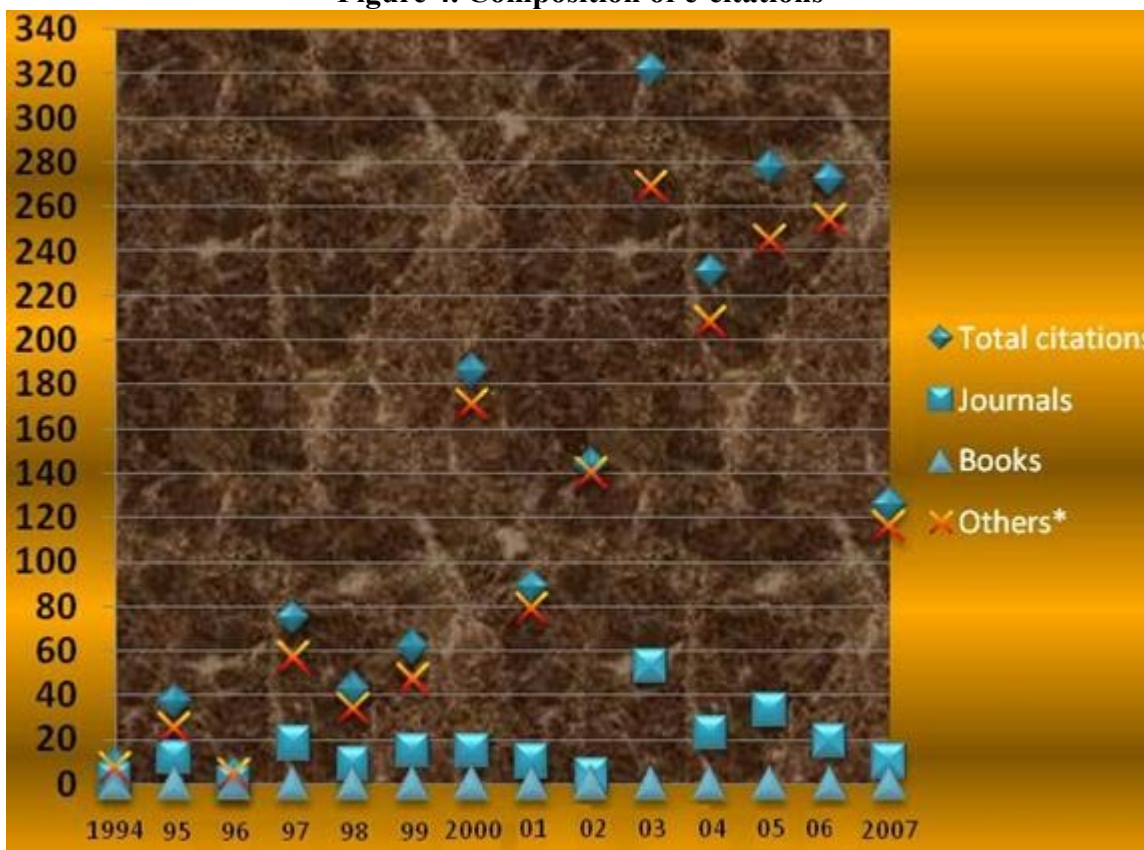
E-citations				
Year	Total citations	Journals	Books	Others*
1994	9	2 (22.23)	0	7 (77.77)
1995	37	12 (32.43)	0	25 (67.57)
1996	4	0 (0)	0	4 (100)
1997	75	18 (24)	0	57 (76)
1998	43	9 (20.93)	0	34 (79.07)
1999	62	15 (24.19)	0	47 (75.81)
2000	186	15 (8.07)	0	171 (91.93)
2001	89	10 (11.24)	0	79 (88.76)
2002	144	4 (2.77)	0	140 (97.23)
2003	322	53 (16.46)	0	269 (83.54)

2004	231	23 (9.96)	0	208 (90.04)
2005	278	33 (11.88)	0	245 (88.12)
2006	273	19 (6.96)	0	254 (93.04)
2007	126	10 (7.93)	0	116 (92.07)
Total	1879	223 (11.86)	0	1656(88.14)

Numbers in parentheses indicate percentage.

\*Others include General Web Sites, online Newspapers, Discussion Forum Postings and online Reference Sources

**Figure 4. Composition of e-citations**



### Authorship Pattern

Table 5 finds male dominance in terms of contribution for majority of years but aggregated figures highlights female dominance with contribution of 52.34 % articles during 14 years. Males have contributed more than 50% during the year 1994, 1995, 1997 and 2000-2004. While as female have contributed more than 60% during the year 1996, 1998, 2005-2007.

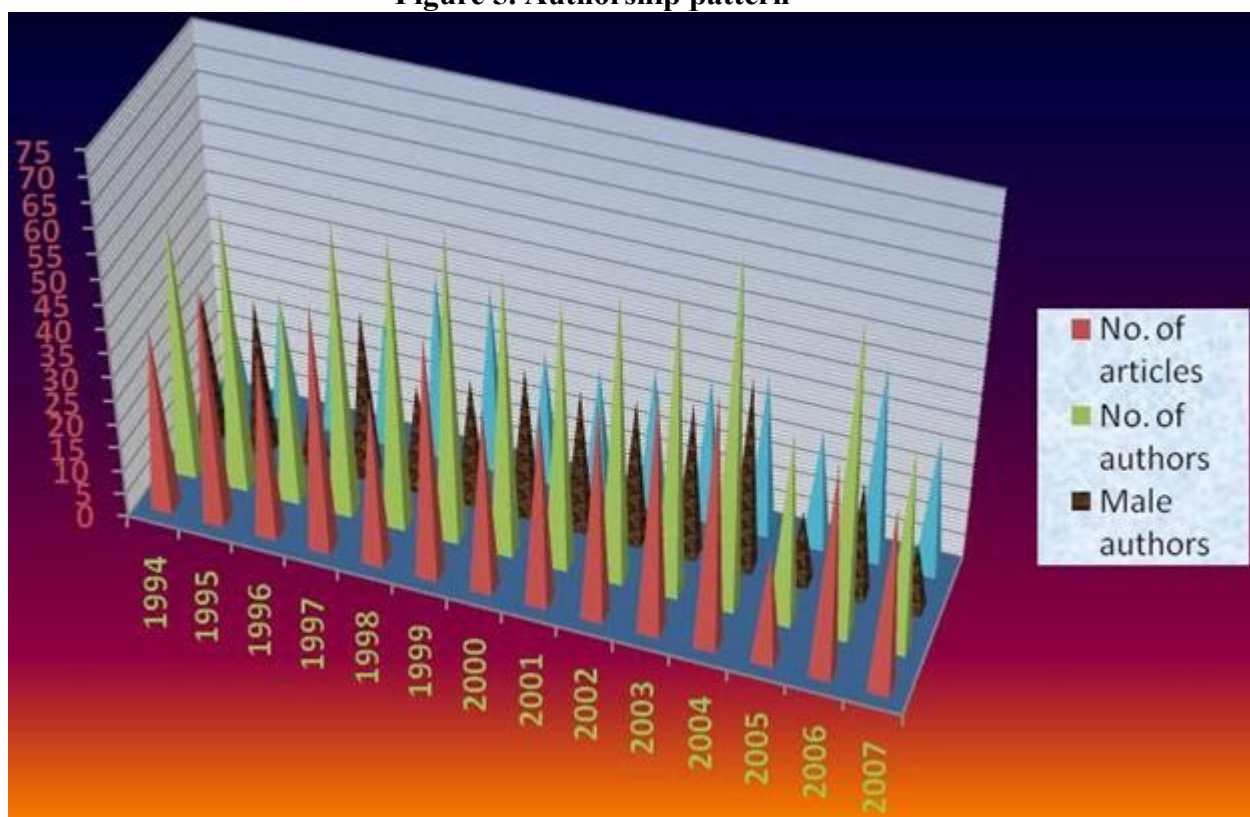
**Table 5. Authorship pattern**

Year	Gender			
	No. of articles	No. of authors	Male authors	Female authors
1994	38	54	31(57.40)	23(42.60)
1995	49	58	32(55.17)	26(44.83)
1996	39	43	17(39.53)	26(60.47)
1997	51	61	35(57.37)	26(42.63)
1998	35	60	22(36.66)	38(63.34)

1999	50	64	26(40.62)	38(59.38)
2000	38	58	31(53.44)	27(46.56)
2001	41	55	29(52.72)	26(47.28)
2002	45	59	30(50.84)	29(49.16)
2003	50	62	32(51.61)	30(48.39)
2004	52	73	40(54.79)	33(45.21)
2005	23	39	15(38.46)	24(61.54)
2006	44	65	24(36.92)	41(63.08)
2007	38	42	14(33.33)	28(66.67)
TOTAL	593	793	378(47.66)	415(52.34)

Numbers in parentheses indicate percentage.

**Figure 5. Authorship pattern**



## Conclusion

The quantitative growth of articles is in the range of 23-52. Total of 593 articles in 56 issues are published during the period. On an average 11 articles are appended to each issue of the journal. 15662 sources are consulted with greater reliance and usability of print sources with less consultation of e-citations (1879). An average of 23.2 p-citations and 3.1 e-citations are consulted for each article. Further it was observed that the usage of print sources varies when compared and analyzed under various resource categories. The authors have relayed much on books and journals with a difference of decimal fraction in their usage which varies heavily when compared to other resource types. Coming to usage of e resources here the shocking statistics is that there is 0% usage of e-books in 14 years and only 11.86% usage of e-journals as compared to 88.14% of other types of e-resources



consulted. Study reveals that Females occupy a more elevated position in terms of contribution.

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***Bibliographic information of this paper for citing:***

Jan, Rosy (2009). "Citation Analysis of Library Trends." *Webology*, **6**(1), Article 67.  
Available at: <http://www.webology.org/2009/v6n1/a67.html>

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