

Use of web based sources in scholarly electronic journals in the field of library and information science: a citation analysis

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Citation analysis of research articles from scholarly electronic journals in the field of library and information science published during the years 2000 to 2006 shows that 81.49% of articles published during the period have web references. Out of 25,730 references, 56.54 % of references are print journal references and 43.52% of them are web references.

Introduction

The growing web based sources and emerging network technologies have been revolutionizing society by making information available to the people in new ways. These two forces are leading to radical change in the operation of scholarly communications. As a consequence of such an electronic reform, web based sources such as electronic journals, magazines and newsletters are growing steadily. In addition, there are many self-publications, preprints and conference proceedings being made available on the web.

The studies of Harter¹, Harter and Kim², Zhang³, Graham⁴ and Herring⁵ show that there is continuous growth in the use of web based sources in the scholarly journals. However, to what extent the web based sources as a whole have been accepted and used as alternatives and/or additions to traditional means in the formal scholarly communications system is still unclear. In this context this study tries to investigate to what extent the web based sources have been used in formal scholarly communication in terms of being cited, by conducting a case study in the field of library and information science for the years 2000 to 2006.

Objectives of the study

The main objectives of the study are:

- To find out to what extent are researchers using web based sources in their research,
- To know the overall impact of web based sources on formal communication in the field of library and information science, and
- To find if e-journal articles are more likely to cite web based sources than print journal articles.

Methodology

The data for this study were drawn from a selective sample of online e-journals available without subscription or registration. Nine e-journals were selected in the area of library and information science. All articles published in these nine journals during 2000 to 2006 were examined and all research articles that included citations were selected. A total of 1277 articles are found, out of which 1035 article have web references.

Data concerning total number of articles, total number of articles with web references, total number of references, total number of web references and total number of print journal references were recorded. The data collected for the study has been analysed and presented in the form of tables and graphs.

Selected e-journals for the study

The selected e-journals and their web addresses are listed in Table 1.

Analysis

D-LIB Magazine

Table 2 shows that 333 articles were published in *D-LIB Magazine* during 2000-2006, out of which 89.19% of articles have web references. For the year 2006 more number of web references (97.78%) are found. The table also illustrates the percentage of web references and print journal references in the *D-LIB Magazine*. A total 5,634 references are found and out of which 71.16% of references are web references and only 28.84% of references are print journal references.

E-JASL (Electronic Journal of Academic and Special Librarianship)

In case of *E-JASL*, 70 articles were published during the year 2000-2006 out of which 75% of articles have web references. It is also observed that all the articles published in the year 2005 have web references (Table 3).

The table also shows the percentage of web references as well as print journal references in the articles published during 2000-2006. Total 896 references are found and out of which 71.88% of references are print journal references and 28.13% of references are web references.

Information Research: An International Electronic Journal

Table 4 shows the percentage of articles having web references from the year 2000 to 2006. A total 221 articles are published in *Information Research: An International Electronic Journal*, out of which 78.73% of articles have web references. In the year 2006, more number of web references (93.02%) are found.

Data regarding the percentage of web references and print journal references shows that 82.65% of references are print journal references and only 17.35% of references are web references.

Journal of Digital Information

In the case of the *Journal of Digital Information*, 146 articles are found and out of which 84.25% of articles have web references. In the year 2001 more number of web references (93.33%) are found and comparatively less number of web references (77.27%) are found in the year 2002 (Table 5). The table also shows that total 3,619 references are found, and out of which 60.62% of references are print journal references and only 39.38% of references are web references.

ARIADANE

Table 6 shows the percentage of articles having web references from the year 2000 to 2006. A total 222

Table 1 — E-journals and their web addresses

Sl. No.	Name of the E-journal	Web address (URL)
1	<i>D-LIB Magazine</i>	http://www.dlib.org/
2	<i>E-JASL (Electronic Journal of Academic and Special Librarianship)</i>	http://southernlibrarianship.icaap.org/
3	<i>Information Research- An International Electronic Journal</i>	http://informationr.net/ir/
4	<i>Journal of Digital Information</i>	http://journals.tdl.org/jodi
5	<i>ARIADANE</i>	http://www.ariadne.ac.uk/
6	<i>Library Philosophy and Practice</i>	http://www.webpages.uidaho.edu/~mbolin/lpp.htm
7	<i>Issues in Science and Technology Librarianship</i>	http://www.istl.org/
8	<i>Cybermetrics: International Journal of Scientometrics, Informetrics, and Bibliometrics</i>	http://www.cindoc.csic.es/cybermetrics/cybermetrics.html
9	<i>School Library Media Research</i>	http://www.ala.org/aaslslmrTemplate.cfm?Section=slmrb&CFID=84071722&CFTOKEN=83426299

Table 2 — Percentage of articles having web references for *D-LIB Magazine*

Year	Total number of articles	Total number of articles with web references	Total number of references	Total number of web references	Total number of print journal references
2000	48	36 (75.00)	595	425 (71.42)	170 (28.57)
2001	45	43 (95.56)	693	459 (66.23)	234 (33.76)
2002	49	47 (95.91)	973	679 (69.78)	294 (30.22)
2003	52	44 (84.61)	926	606 (65.44)	320 (34.55)
2004	40	38 (95.00)	689	509 (73.88)	180 (26.12)
2005	54	45 (83.33)	1034	780 (75.43)	254 (24.56)
2006	45	44 (97.78)	724	551 (76.10)	173 (23.89)
Total	333	297 (89.19)	5634	4009 (71.16)	1625 (28.84)

Note: Number within the parenthesis represents the percentage

Table 3 — Percentage of articles having web references for *E-JASL*

Year	Total number of articles	Total number of articles with web references	Total number of references	Total number of web references	Total number of print journal references
2000	7	1 (14.29)	60	4 (6.67)	56 (93.33)
2001	2	1 (50.00)	43	5 (11.63)	38 (88.37)
2002	9	3 (33.33)	110	53 (48.18)	57 (51.82)
2003	8	5 (62.5)	104	25 (24.04)	79 (75.96)
2004	11	9 (81.81)	197	68 (34.52)	129 (65.48)
2005	14	14 (100)	170	51 (30)	119 (70)
2006	19	12 (63.16)	212	46 (21.69)	166 (78.30)
Total	70	45(75)	896	252(28.13)	644(71.88)

Note: Number within the parenthesis represents the percentage

Table 4 — Percentage of articles having web references for *Information Research: An International Electronic Journal*

Year	Total number of articles	Total number of articles with web references	Total number of references	Total number of web references	Total number of print journal references
2000	23	14 (60.87)	679	108 (15.91)	571 (84.09)
2001	34	19 (55.88)	960	99 (10.31)	861 (89.69)
2002	24	20 (83.33)	599	150 (25.04)	449 (74.96)
2003	21	19 (90.48)	995	212 (21.31)	783 (78.69)
2004	45	38 (84.44)	1170	228 (19.49)	942 (80.51)
2005	31	24 (77.42)	1189	135 (11.35)	1054 (88.65)
2006	43	40 (93.02)	1565	310 (19.81)	1255 (80.19)
Total	221	174 (78.73)	7157	1242 (17.35)	5915 (82.65)

Note: Number within the parenthesis represents the percentage

Table 5 — Percentage articles having web references for *Journal of Digital Information*

Year	Total number of articles	Total number of articles with web references	Total number of references	Total number of web references	Total number of print journal references
2000	9	7 (77.78)	252	66 (26.19)	186 (73.81)
2001	15	14 (93.33)	401	171 (42.64)	230 (57.36)
2002	22	17 (77.27)	555	185 (33.33)	370 (66.67)
2003	46	36 (78.26)	558	179 (32.08)	379 (67.92)
2004	38	35 (92.11)	1243	686 (55.18)	557 (44.81)
2005	9	8 (88.89)	307	82 (26.71)	225 (73.29)
2006	7	6 (85.71)	303	56 (18.48)	247 (81.52)
Total	146	123(84.25)	3619	1425(39.38)	2194(60.62)

Note: Number within the parenthesis represents the percentage

Table 6 — Percentage of articles having web references for *ARIADANE*

Year	Total number of articles	Total number of articles with web references	Total number of references	Total number of web references	Total number of print journal references
2000	25	20 (80.00)	261	197 (75.48)	64 (24.52)
2001	39	34 (87.18)	498	424 (85.14)	74 (14.86)
2002	32	28 (87.5)	386	319 (82.64)	67 (17.36)
2003	29	29 (100)	435	392 (90.11)	43 (9.86)
2004	30	30 (100)	467	454 (97.22)	13 (2.78)
2005	33	32 (96.97)	551	504 (91.47)	47 (8.53)
2006	34	34 (100)	671	554 (82.56)	117 (17.43)
Total	222	207 (93.24)	3269	2844 (86.99)	425(13)

Note: Number within the parenthesis represents the percentage

Table 7 — Percentage of articles having web references for *Library Philosophy and Practice*

Year	Total number of articles	Total number of articles with web references	Total number of references	Total number of web references	Total number of print journal references
2000	7	2(28.57)	52	3 (5.77)	49 (94.23)
2001	6	3 (50)	76	22 (28.95)	54 (71.05)
2002	10	5 (50)	82	25 (30.49)	57 (69.51)
2003	9	3 (33.33)	147	51 (34.69)	96 (65.31)
2004	11	7 (63.64)	163	52 (31.90)	111 (68.09)
2005	18	11 (61.11)	296	43 (14.53)	253 (85.47)
2006	35	21 (60)	655	145 (22.13)	510 (77.86)
Total	96	52 (54.17)	1471	341(23.18)	1130(76.82)

Note: Number within the parenthesis represents the percentage

Table 8 — Percentage of articles having web references for *Issues in Science and Technology Librarianship*

Year	Total number of articles	Total number of articles with web references	Total number of references	Total number of web references	Total number of print journal references
2000	19	15 (78.95)	197	52 (26.4)	145 (73.60)
2001	21	14 (66.67)	163	51 (31.29)	112 (68.71)
2002	17	13 (76.47)	157	52 (33.12)	105 (66.88)
2003	14	7 (50)	210	29 (13.81)	181 (86.19)
2004	26	14 (53.85)	294	88 (29.93)	206 (70.07)
2005	16	12 (75)	152	59 (38.82)	93 (61.18)
2006	24	18 (75)	291	98 (33.68)	193 (66.32)
Total	137	93 (67.88)	1464	429(29.30)	1035(70.70)

Note: Number within the parenthesis represents the percentage

Table 9 — Percentage of articles having web references for *Cybermetrics*

Year	Total number of articles	Total number of articles with web references	Total number of references	Total number of web references	Total number of print journal references
2000	4	4 (100)	106	15 (14.15)	91 (85.85)
2001	2	2 (100)	63	11 (17.46)	52 (82.54)
2002-03	2	1 (50)	33	3 (9.09)	30 (90.91)
2004	2	2 (100)	67	4 (5.97)	63 (94.03)
2005	3	3 (100)	158	40 (25.32)	118 (74.68)
2006	6	5 (83.33)	226	39 (17.26)	187 (82.74)
Total	19	17(89.47)	653	112(17.15)	541(82.85)

Note: Number within the parenthesis represents the percentage

Table 10 — Percentage of articles having web references for *School Library and Media Research*

Year	Total number of articles	Total number of articles with web references	Total number of references	Total number of web references	Total number of print journal references
2000	7	5 (71.43)	424	388 (91.51)	36 (8.49)
2001	6	3 (50)	381	22 (5.77)	359 (94.23)
2002	6	5 (83.33)	267	37 (13.86)	230 (86.14)
2003	3	3 (100)	96	5 (5.21)	91 (94.79)
2004	4	4 (100)	114	23 (20.18)	91 (79.82)
2005	3	3 (100)	166	42 (25.3)	124 (74.69)
2006	4	4 (100)	119	28 (23.53)	91 (76.47)
Total	33	27(81.82)	1567	545(34.78)	1022(65.22)

Note: Number within the parenthesis represents the percentage

articles were published in *ARIADANE*, out of which 93.24% of articles have web references. All the articles published in the year 2003, 2004 and 2006 have web references. Table 6 also illustrates the percentage of web references as well as print journal references. It is clear from the table that total 3269 references are found and out of which 86.99% of references are web references and only 13% of references are print journal references.

Library Philosophy and Practice

Table 7 illustrates the percentage of articles having web references from the year 2000 to 2006. Only 96 articles are published in *Library Philosophy and Practice*, out of which 54.17% of articles have web references. In the year 2004 more number of web references (63.64%) are found. Percentage of web references and print journal references are also presented in the Table 7. It is clear from the table that total 1471 references are found and out of which 76.82% of references are print journal

references and only 23.18% of references are web references

Issues in Science and Technology Librarianship

Percentage of articles having web reference in the journal *Issues in Science and Technology Librarianship* is shown in Table 8. A total of 137 articles were published during the years 2000 to 2006, out of which 67.88% of articles have web references. In the year 2000, more number of web references (78.95%) are found. Data regarding the percentage of web references and print shows that totally 1464 references are found and out of which 70.70% of references are print journal references and only 29.30% of references are web references.

Cybermetrics: International Journal of Scientometrics, Informetrics and Bibliometrics

Comparatively very few articles are published in the *Cybermetrics: International Journal of Scientometrics,*

Table 11 — Percentage of articles having web references in different e-journals

E-journal	Total number of articles	Total number of articles with web references	Total number of references	Total number of web references	Total number of print journal references
<i>D-LIB Magazine</i>	333	297(89.19)	5634	4009(71.16)	1625(28.84)
<i>E-JASL (Electronic Journal of Academic and Special Librarianship)</i>	70	45(64.28)	896	252(28.13)	644(71.88)
<i>Information Research- An International Electronic Journal</i>	221	174(78.73)	7157	1242(17.35)	5915(82.65)
<i>Journal of Digital Information</i>	146	123(84.25)	3619	1425(39.38)	2194(60.62)
<i>ARIADANE</i>	222	207(93.24)	3269	2844(86.99)	425(13.00)
<i>Library Philosophy and Practice</i>	96	52(54.17)	1471	341(23.18)	1130(76.82)
<i>Issues in Science and Technology Librarianship</i>	137	93(67.88)	1464	429(29.30)	1035(70.7)
<i>Cybermetrics: International Journal of Scientometrics, Informetrics, and Bibliometrics</i>	19	17(89.47)	653	112(17.15)	541(82.85)
<i>School Library Media Research</i>	33	27(81.82)	1567	545(34.78)	1022(65.22)
Total	1277	1035(81.6)	25730	11199(43. 52)	14531(56. 54)

Note: Number within the parenthesis represents the percentage

Table 12 — Percentage of articles having web references by year

Year	Total number of articles	Total number of articles with web references	Total number of references	Total number of web references	Total number of print journal references
2000	149	126 (84.56)	2626	1258 (47.90)	1368 (52.09)
2001	170	130 (76.47)	3278	1264 (38.56)	2014 (61.43)
2002	171	134 (78.36)	3168	1503 (47.44)	1659 (52.36)
2003	182	143 (78.57)	3471	1499 (43.18)	1972 (56.81)
2004	207	173 (83.57)	4404	2112 (47.95)	2292 (52.04)
2005	181	149 (82.32)	4023	1736 (43.15)	2287 (56.84)
2006	217	180 (82.94)	4766	1827 (38.33)	2939 (61.66)
Total	1277	1035 (81.05)	25730	11199 (43.52)	14531 (56.47)

Note: Number within the parenthesis represents the percentage

Informetrics and Bibliometrics and out of which 89.47% of articles have web references. All the articles published during the year 2000, 2001, 2004 and 2005 have web references. Table 9 also indicates the percentage of web references and print journal references. Total 653 references are found, out of which 82.85% of references are print journal references and only 17.15% of references are web references.

School Library Media Research

Table 10 shows the percentage of articles having web references from the year 2000 to 2006. A total of 33 articles were published in *School Library Media Research* and out of which 81.82% of articles have web references.

All the articles published in the years 2003, 2004 and 2006 have web references. Percentage of web references and print journal references in the *School Library Media Research* is also presented in the table. A total of 1567 references are found, out of which 65.22% of references are print journal references and only 34.78% references are web references.

Percentage of articles having web references in different e-journals

Percentage of articles having web references in different e-journals is presented in Table 11.

More number of articles having web references are found in *ARIADANE* (93.24%) followed by *Cybermetrics:*

International Journal of Scientometrics, Informetrics, and Bibliometrics (89.47%) and *D-LIB Magazine* (89.19%). Overall 81.68% of articles have web references. *ARIADANE* has more number (86.99%) of web references while *Cybermetrics: International Journal of Scientometrics, Informetrics, and Bibliometrics* (82.65%) has more number of print journal references. Results of the study also indicate that 56.47% of print journal references and 43.52% of web references are found in all nine e-journal's articles across the years 2000-2006.

Percentage of articles having web references by year

Percentage of articles having web references, percentage of web references and print journal references are illustrated in Table 12. It is observed that 81.05% of articles have web references during the year 2000-2006. In case of 2001 (76.47%) comparatively less number of articles have web references.

Conclusion

The present study shows the use of web based sources in the scholarly e-journals in the area of library and information science is almost equal to that of print sources as measured by web references cited in e-journal articles published during 2000-2006. Study shows that the use of web references is more in 2000 and it has decreased significantly in the year 2001. From the year 2002, there is continuous growth in the use of web references in the

e-journals. Another important observation of the study is that the scholars used more print journal references in the scholarly e-journals as compared to web references.

Problem for web sources to be accepted and cited is associated with the limitations of web based sources themselves. The dynamic nature of the web based sources leads to the instability of some of its sources, including content fluidity and changes in technologies used to provide access to the web based sources. Continuing accessibility of web based sources is still a serious problem that may affect their acceptability among scholars as legitimate medium of formal scholarly communication. Efforts need to be made to identify what factors promote or inhibit using the web based sources in scholarly communication so that we can have a strategic plan for such a transition.

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