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A Scientometric Study of Digital Literacy in Online Library Information Science and Technology Abstracts (LISTA)

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Abstract

The present paper is a Scientometric Study of Digital Literacy in Online Library Information Science and Technology Abstracts (LISTA) during the year 1997 to 2011. The study attempts to examine the distribution of articles (age-wise, year-wise, and article-wise), authorship pattern, subject, language, and geographical distribution. Bradford's law used to determine the scattering of journal articles in the publication pattern on the LISTA database. Results indicate that majority of articles published during the year 2009-2011 and focus mainly on academic education. International Information & Library Review have published greater number of articles on digital literacy.

Keywords: Digital Literacy, Scientometric Study, Information Communication Technology

Introduction

The scope of Scientometric studies has been increased in recent years. To ensure a common understanding among all key stakeholders within the state and various local and regional entities, the ICT Digital Leadership Council has chosen to define Digital Literacy as "a lifelong learning process of capacity building for using digital technology[1], communications tools, and/or networks in creating, accessing, analysing, managing, integrating, evaluating, and communicating information in order to function in a knowledge based economy and society". This article is a Scientometric Study of Digital Literacy in Online Library Information Science and Technology Abstracts (LISTA) during the year 1997 to 2011. LISTA is available free to any library - compliments of EBSCO Publishing. LISTA indexes more than 580 core journals[2], nearly 50 priority journals, and nearly 125 selective journals; plus books, research reports and proceedings. Subject coverage includes librarianship, classification, cataloguing, Bibliometric, online information retrieval, information management and more.

Review of Literature

Bibliometric methods have been used to measure scientific progress in many disciplines of science and engineering and are a common research instrument for systematic analysis (Van Raan, 2005)[3]. Since Narin et al. (1976)[4] first proposed the concept of "evaluative Bibliometric", many scientists have tried to evaluate the research trend in the publication outputs of countries, research institutes, journals and subject category (Garcia-Rio et al., 2001; Zhou et al., 2007)[5,6], the citation analysis (Cole, 1989)[7] and the peak year citation per publication (Chuang et al., 2007; Li and Ho, 2008)[8,9]. Roberts, Joni R (2006)[10], focuses on the EBSCO databases that provide services to libraries. The paper includes Library, Information Science, and Technology Abstracts (LISTA) resources focusing on librarianship, classification, cataloguing, Bibliometric, online information retrieval, and information science. LISTA has more than 21,000 articles from more than 600 periodicals and includes more than 5,000 conference papers and reports. The EBSCO host interface is simple to use and easy to grasp while LISTA is a free abstract database.

Objectives of the Study

The objectives of the present study are to:

- Test the growth of digital literacy in the field of library and information science.
- Prepare a ranked list of articles published on digital literacy in the LISTA database from the year 1997-2011.
- Determine Year-wise, subject-wise, article-wise, age-wise and Language-wise distribution of articles published in the LISTA database of digital literacy.
- Study authorship patterns in articles.
- Apply Bradford law to the collected data of journals on digital literacy.
- Trace geographical distribution of journal articles on digital literacy.

Scope and Limitation

- The present study is based on journal articles indexed in the LISTA database during the period 1997-2011. i. e, for 15 years.
- The subject coverage is limited to articles on Digital Literacy.
- In fifteen years 137 articles on Digital literacy are indexed in LISTA. Hence, the present study covers only 137documents.
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Research Methodology

Scientometric method has been used in the present study. On very initial stage the investigator researcher has started to search the articles from the online database for Library, Information Science, and Technology Abstract (LISTA) on Digital Literacy. The time period 1997 to 2011 was taken into consideration. For each article one card was prepared with bibliographical details like Name of Authors, Title, Name of Journal, Year of Publication, Vol. no., Issue no., Keywords etc.

Data Analysis and Interpretation of the Study

The questionnaires were edited, tabulated, and analysed for deriving findings of the study. To make the data analysis statistically sound, necessary statistical techniques are used.

Year Wise Distribution

Table 1: Year Wise Distribution of Articles

S.No.	Year	No. of Articles	Cumulative	Rank
1	1997-1999	3 (2.19)	3 (2.19)	**5**
2	2000-2002	5 (3.65)	8 (6.65)	**4**
3	2003-2005	17 (12.41)	25 (18.25)	**3**
4	2006-2008	37 (27.01)	62 (45.25)	**2**
5	2009-2011	75 (54.74)	137 (100)	**1**
Total		**137 (100)**	**137 (100)**	

(Figures in Parentheses indicate percentage)

Table 1 provides the data published on digital library in the LISTA database from the year 1997-2011. 54.74% articles published during the year 2009-2011, followed by 27.01% from the year 2006-2008 and 12.41% during the year 2003-2005. Figure 1 shows year-wise distribution of articles on digital literacy.

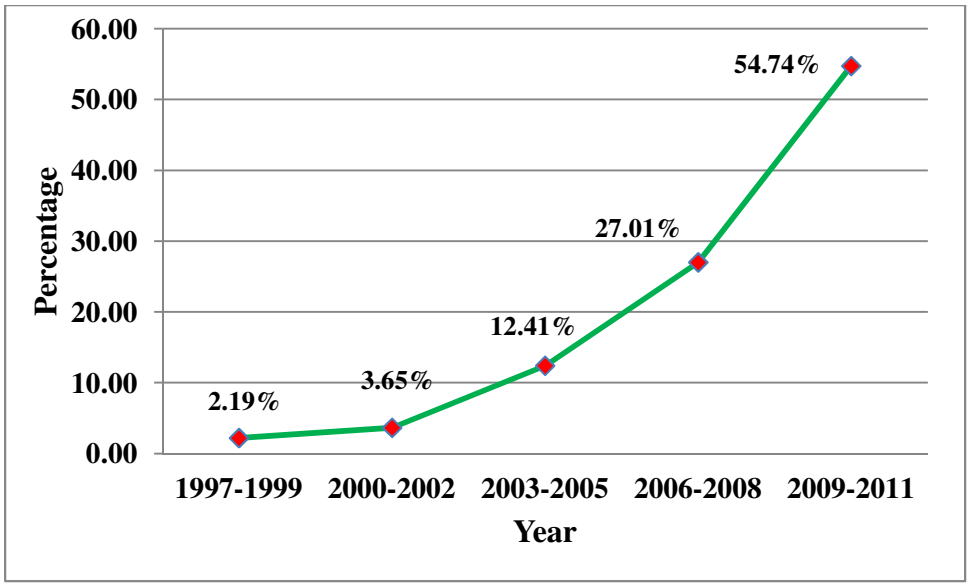

Figure 1 Years wise distribution

Subject wise Distribution

Table 2: Subject Wise Distribution of Articles on Digital Literacy

S.No.	Subject	No. of Articles	Cumulative	Rank
1	Education	73 (53.28)	73 (53.28)	**1**
2	Information Technology	31 (22.63)	104 (75.91)	**2**
3	Computer Science	14 (10.22)	118 (86.13)	**4**
4	Tele Communication	19 (13.87)	137 (100)	**3**
Total		**137 (100)**	**137 (100)**	

(Figures in Parentheses indicate percentage)

The data in table 2 presents subject wise distribution of articles on digital literacy. It is observed that articles on education has been published in huge numbers (53.28%) followed by articles on Information Technology (22.63%).

Articles wise Distribution

Table 3: Article Wise Distribution on Digital Literacy

S.No.	Types of Articles	No. of Articles	Cumulative	Rank
1	Academic Journal	95 (69.34)	95 (69.34)	**1**
2	Book	11 (8.03)	106 (77.37)	**3**
3	Periodical	21 (15.33)	127 (92.70)	**2**
4	Conference	6 (4.38)	133 (97.08)	**5**
5	Review	4 (2.92)	137 (100)	**4**
Total		**137 (100)**	**137 (100)**	

(Figures in Parentheses indicate percentage)

Table 3 represents the article wise distribution of digital literacy in the field of library and information science. It would be understood from the table that 69.34% articles on digital literacy published in academic journals followed by periodicals (15.33%).

Authorship Pattern

Table 4 Authorship Pattern Distribution

S.No.	Authorship Pattern	No. of Articles	Cumulative	Rank
1	Single	17 (12.41)	17 (12.41)	**4**
2	Double	43 (31.39)	60 (43.79)	**2**
3	Three	48 (35.04)	108 (78.83)	**1**
4	Above Three	29 (21.17)	137 (100)	**3**
Total		**137 (100)**	**137 (100)**	

(Figures in Parentheses indicate percentage)

Focusing on the authorship pattern of distribution, it is vivid from table 4 that 35.04% documents have three authorship pattern, followed by 31.39% documents having a double authorship pattern the above mentioned data is represented through a pie chart in figure 2.

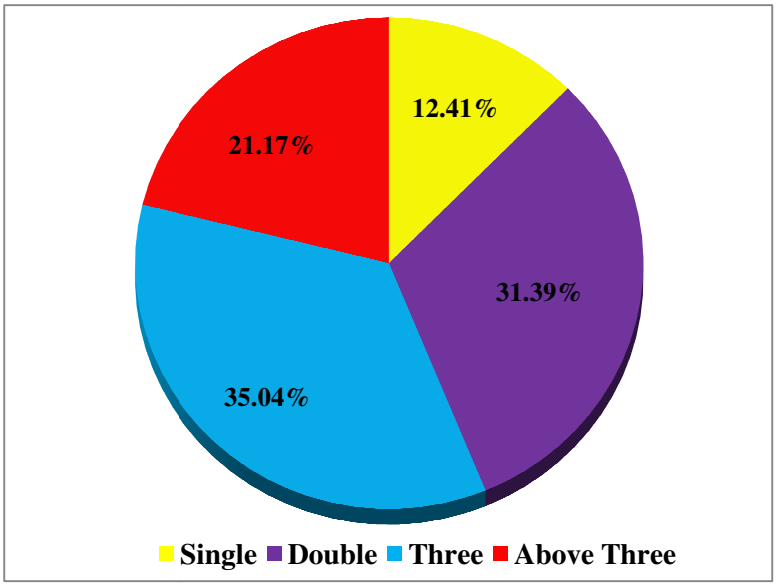

Figure 2 Authorship Pattern wise distribution

Age wise Distribution

Table 5 Age Wise Distribution of articles on Digital Literacy

S.No.	Age	No. of Articles	Cumulative	Rank
1	25-30	9 (6.57)	9 (6.57)	**5**
2	30-35	23 (16.79)	32 (23.36)	**3**
3	35-40	54 (39.42)	86 (62.77)	**1**
4	40-45	37 (27.01)	123 (89.78)	**2**
5	Above 45	14 (10.22)	137 (100)	**4**
Total		**137 (100)**	**137 (100)**	

(Figures in Parentheses indicate percentage)

The data in table 5 provides an idea on age wise distribution of articles on digital literacy indexed in LISTA database. It is seen from the above table that author's who are between the age of 35-40 had published greater number of articles, while 27.01% articles are published by authors aged between 40-45.

Language Wise Distributions

Table 6 Language Wise Distribution of articles on Digital Literacy

S.No.	Language	No. of Articles	Cumulative	Rank
1	English	127 (92.70)	127 (92.70)	**1**
2	Chinese	3 (2.19)	130 (94.89)	**3**
3	German	4 (2.92)	134 (97.81)	**2**
4	Italian	2 (1.46)	136 (99.27)	**4**
5	Spanish	1 (0.73)	137 (100)	**5**
Total		**137 (100)**	**137 (100)**	

(Figures in Parentheses indicate percentage)

Language wise distribution of articles on digital literacy is mentioned in table 6. It is observed from the above table that higher numbers of articles are published in English language (92.70%) while 2.92% articles are published in German.

Geographical Distributions

Table 7 Geographical Wise Distribution

S.No.	Geographical	No. of Articles	Cumulative	Rank
1	Australia	9 (6.57)	9 (6.57)	**6**
2	Bangladesh	6 (4.38)	15 (10.94)	**8**
3	China	3 (2.19)	18 (13.14)	**10**
4	France	7 (5.11)	25 (18.25)	**7**
5	Germany	4 (2.92)	29 (21.16)	**9**
6	India	11 (8.03)	40 (29.19)	**5**
7	New Zealand	14 (10.22)	54 (39.41)	**3**
8	Nigeria	12 (8.76)	66 (48.17)	**4**
9	United Kingdom	37 (27.01)	103 (75.18)	**1**
10	United States of America	34	137	**2**

		(24.82)	(100)	
Total		**137 (100)**	**137 (100)**	

(Figures in Parentheses indicate percentage)

Table 7 provides geographical wise distribution of articles on digital literacy in the field of library and information science indexed in LISTA database. From the above table it is known that around 25.01% articles are published from United Kingdom while 24.82% articles published by the United States of America ad 10.22% articles are from New Zealand.

Ranked list of Journals

Table 8 Ranking of Journals & Bradford Law

S.No.	Journal Name	No. of Articles	Cumulative No of Articles	Rank
1	International Information & Library Review	11 (8.03)	73 (53.28)	**1**
2	Aslib Proceedings	9 (6.57)	16 (11.68)	**2**
3	Information Searcher	9 (6.57)	45 (32.85)	**2**
4	Innovations in Teaching & Learning in Information & Computer Sciences,	9 (6.57)	62 (45.26)	**2**
5	International Journal of Web Based Communities	9 (6.57)	82 (59.85)	**2**
6	Journal of Educational Media & Library Sciences	9 (6.57)	98 (71.53)	**2**
7	Journal of Educational Multimedia & Hypermedia	8 (5.84)	106 (77.37)	**3**
8	Information, Communication & Society	8 (5.84)	53 (38.69)	**3**
9	Communications in Information Literacy	8 (5.84)	30 (21.90)	**3**
10	A Journal of Academic Librarianship	7 (5.11)	7 (5.11)	**4**
11	Journal of Documentation	7 (5.11)	89 (64.96)	**4**
12	Journal of Information Science	7 (5.11)	113 (82.48)	**4**
13	Current Reviews for Academic Libraries	6 (4.38)	36 (26.28)	**5**
14	Library & Information Science Research	6 (4.38)	124 (90.51)	**5**

15	Bulletin of the American Society for Information Science & Technology	6 (4.38)	22 (16.06)	**5**
16	Journal of Information Systems Education	5 (3.65)	118 (86.13)	**6**
17	Webology	4 (2.92)	137 (100)	**7**
18	Library Review	4 (2.92)	130 (94.89)	**7**
19	Reference Librarian	3 (2.19)	133 (97.08)	**8**
20	Library Philosophy & Practice	2 (1.46)	126 (91.97)	**9**
Total		**137 (100)**	**137 (100)**	

(Figures in Parentheses indicate percentage)

The above table 8 presents the overall ranking of journals that had published articles on digital literacy. It could be interpreted from the table, that 8.03% articles are published in the journal of international information and library review and had gained first rank, while 6.57% articles are published in following journals: Aslib proceedings, Information seeker Innovation in Teaching and Learning in Information and Computer sciences, International journal of web based communities, journal of educational multimedia and hypermedia.

Bradford's Law of Scattering

Bradford[11] in 1934 described a scattering pattern in applied geophysics. He plotted the partial sum of references against the natural logarithm of the partial sums of a number of journals and noticed that the resulting graph was a straight line. On the basis of this observation, he suggested the following linear relation to describe a scattering phenomenon: F (x) =a+b log X, where F (x) is the cumulative number of references contained in the first X-most productive journals. "a" and "b" are constants, Bradford, thus, based on a semi-logarithmic group argued that: If scientific journals are arranged in order of decreasing productivity of articles on a given subject, they may be divided into a nucleus of periodicals more particularly devoted to the subject and several groups or zones containing the same number of articles as the nucleus when zones will be 1: n: n2. Where 1 represents the number of journals in the nucleus and 'n' is a multiplier.

Table 9: Bradford's Law of Scattering – zones

Zone	Total No. of Journals in Each Zone	No. of Source Journals	No. of Articles Per Source	Total No. of Articles	Total No. of Articles in Each Zone
1	**3**	1	30	30	**46**
		2	8	16	
2	**9**	2	5	10	**46**
		2	4	8	
		3	6	18	
		2	5	10	
3	**27**	5	3	15	**46**
		9	2	18	
		8	1	8	
		5	1	5	

Table 9 is divided into 3 zones which depict following data: Each zone represents one or more journals published during the period 1997-2011on digital literacy. The most productive journals are listed at the top of the list, and other journals are listed in order of decreasing productivity. In the zone 1, there is a total of 3 journals published 46 articles on digital literacy. In the next zone it is seen that there are 9 journals, published a total of 46 articles. In the third zone 46 articles are scattered across 27 journals. If the number of journals in each zone is observed, the relationship that Bradford delineated in his law could be understood. In the first zone there are 3 journals. In the second zone there are 9 (which is 3^2) journals; and in the third zone there are 27 (which is 3^3) journals. The following figure 3, provides information on Bradford's Law of Scattering through a scatter plot.

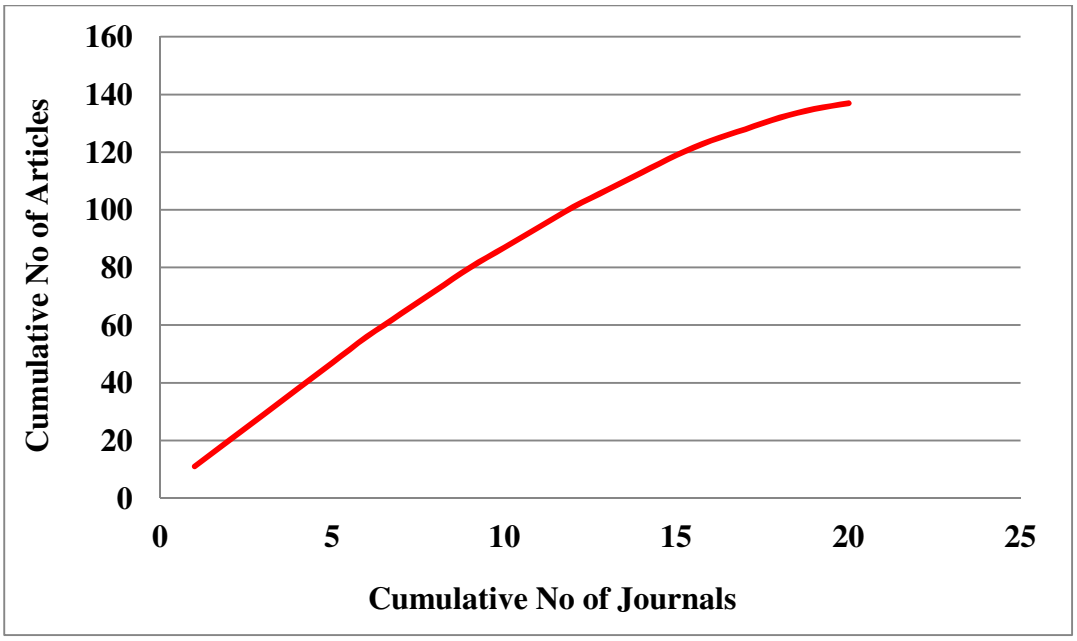

Figure 3: Bradford's Law of Scattering

In the present study, 03 journals covered 46 articles, the next 09 journals covered 46 articles, and the next 27 journals covered 46 articles. That is, 03 journals covered one-third of the total articles, the next 09 journals accounted for another one-third, and the final 27 covered the remaining third. Thus, the first zone or 'nucleus' contains 03 journals, followed by the second zone with 09, and the third with 27 journals. The zones form an approximately geometric series in the form. 03:09:27

Here, 27= 9x3, and 243= 27x3x3

i.e. 9: 9 x 3:27x3x3

or 9:27:243

Substituting 5= n

$9:9n:9n^2$

i.e. 1: n: n^2

Where 03 represents the number of journals in the nucleus and n=3 is a multiplier. Bradford's Law of Scattering is confirmed by this data

Findings

The followings are the key findings of the present study:

- A total number of 137 articles on digital literacy published during the year 1997-2011.

- Articles on education and information technology (53.28%) focus significantly on digital literacy.
- Academic journal and periodicals primarily publish articles (69.34%) on digital literacy in the field of library and information science.
- Three authorship patterns (35.04%) found to be dominating feature in articles published on digital literacy.
- Authors in between the age group 35-40 years have found to publish a high number (39.42%) of articles.
- Articles are predominantly published in English (92.70%) followed by German language.
- More numbers of articles are generated from U.K. origin (27.01%) followed by the U.S.A. (24.82%).
- International journal of information and library review (8.03%) have published a greater number of articles on a digital literacy.

Conclusion

Over the last decade, there were tremendous advances in the digital science of learning, made possible by the convergence of research in the cognitive sciences, basic, scientific, economic, Visual and information literacies. Accessing information has become increasingly important as online databases previously accessible only to library media[12] specialists are now available to students directly. Browsing, searching, and navigating online has become essential skills for all students, has recognition of the limitations of digital archives. The greater part of articles published during the year 2009-2011 focus mainly on academic education. The emergence of the ICT responsiveness has acted to revitalize the generation of articles and contributions towards different aspects of digital literacy.

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