

SINGLE JOURNAL BIBLIOMETRIC STUDIES: A REVIEW

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ABSTRACT

Reviews 102 papers on single journal bibliometric studies covered by LISA Plus and CRLIS database during 1969 to Spring 1997.

Keywords: Bibliometrics; LISA Plus; CRLIS; Single journal bibliometric study.

INTRODUCTION

This study aims to survey the bibliometric studies conducted with a single scholarly journal since 1969 till date. The body of literature on the topic was obtained from searching CD-ROM databases namely *LISA Plus* which comprises two databases: *Library and Information Science Abstracts (LISA)* and *Current Research in Library and Information Science (CRLIS)*. The databases were searched in the Main Library of University Malaya through its CD-NET services. The following combined keyword search terms were used to retrieve the relevant items; bibliometric or bibliometrics study and journal or journals, bibliometric or bibliometrics study and periodical or periodicals, citation analysis and journal or journals, citation analysis and periodical or periodicals, content analysis and journal or journals, content analysis and periodical or periodicals, authorship and journal or journals, and authorship and periodical or periodicals. Duplicate and irrelevant articles found were discarded. A thorough examination of the retrieved items produced a total of 102 pertinent items, 99 from *LISA* and 3 from

CRLIS. These items are published in several languages - English (86), Russian (6), Portuguese (3), Spanish (2), French (1), Japanese (1), Chinese (1), Hungarian (1), and Afrikaans (1). The literature found was categorised in the following way:

- Bibliometric study on single journals (40 items)
- Citation analysis of single journals (45 items)
- Content analysis of single journals (11 items)
- Other aspects of bibliometric study on single journals (6 items)

BIBLIOMETRIC STUDIES ON SINGLE JOURNAL

A total of 40 articles studying multiple aspects of single journals was found relevant for this study. Of these items, 33 are in English, 2 each in Russian and Spanish and 1 each in French, Japanese and Portuguese. Out of these 40 items, journal articles account for 37, and one each consists of a conference paper, summary of study at a poster session, and a project paper from *CRLIS*. From the subject-wise

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distribution of journals, 20 were on library and information science, 15 science, technology, and medicine and 5 arts, humanities, and social sciences.

Bibliometric Studies of Library & Information Science Journals

One of the earliest bibliometric study on single LIS journal is by Meadow (1979), who analysed the *Journal of the American Society for Information Science (JASIS)* in terms of author characteristics and citation patterns, and authors in a core list of 10 other information science journals. He also noted the processing time, production time and discussed about the need to cut down those times for better dissemination of information. Thirteen years later, Harter (1992) also conducted a bibliometric study on 9 volumes of *JASIS* 1972-1974, 1982-1984 and 1988-1990 to study variables such as the year of publication, number of citations, funding status of the work, funding agency, subject of the paper and institutional affiliation of the first author. It was found that there was no relationship between the funding and the quality or utility of the article; and funding for information science research has declined over the years especially at the federal levels. Apart from that, the emphasis on professional issues and related fields has increased compared to applied articles. More authors are coming from academic departments in universities and fewer from information practitioners.

Lajeunesse (1981) reported the results of an analytical study of the contents of the French-language Canadian journal, *Documentation et Bibliothèques* (formerly *Bulletin de l'ACBLF*), from its first appear-

ance, showing the major developments and changes within the profession and the disciplines in Quebec over the past 25 years.

Gloria S. Cline (1982) examined the changes that occurred in *College & Research Libraries (CARL)* during 1939-1979 in terms of publication and citation patterns. She observed that there exists an overall trend towards greater adherence to the norms of scholarly publication in other disciplines. Metz (1989) updated selected aspects of Cline's analysis through volume 49, 1988 and tried to determine whether the trends discerned in authorship and refereencing practices had continued and to assess the degree to which the journal had published quantitative research throughout its long history. Metz found a dramatic increase in the use of quantitative techniques in the research published in *CARL*. The latest bibliometric study on *CARL* was by J. L. Terry (1996) who continued the study of Cline and Metz with regard to the characteristics of authorship of articles. The study focused on gender, institutional affiliation, and extent of collaboration. The study found the representation by academic librarians and authors affiliated with library schools increased between 1989 and 1994, collaboration became predominant, and for the first time the number of primary women authors equalled that of men. Female co-authors also outnumbered men. Most of the contributing female authors were academic librarians who co-authored articles.

Alekseeva (1983) examined many topical problems of the Russian journal *Sovet-*

skaya Bibliografiya such as editors and contributors over the past years of its existence. It was shown that in the 1930s *Sovetskaya Bibliografiya* was the leading exponent of Decimal Classification and the development of Soviet Library Bibliographical Classification.

Two years later, in 1985, Schrader described and evaluated key bibliometric patterns in the articles published in the *Journal of Education for Librarianship (JEL)* from 1974-1984. The two objectives of the investigation are to find out the population of articles published by *JEL* from 1974-1984 and the population of bibliographic citations found in *JEL* from 1974-1984.

In 1990, Mishra conducted a study with the articles published in *IASLIC Bulletin* between 1984-1988. The objectives of the study was to determine; the year-wise distribution of papers; the proportion of Indian and non-Indian contributions; the distribution of contributions among different types of organisations, authorship pattern; subject distribution; number and nature of references appended to articles; and the average length of papers. In the same year, Anand (1990) attempted to highlight India's position among the library and information science periodical producing countries in the world; described and evaluated source of contributions, authorship and citation patterns of papers published in the *Journal of Library and Information Science (India)* 1976-1989.

Herubel (1991a) examined the gender and institutional affiliation of authors of the scholarly journal *Libraries and Culture* to

find out the pattern and trends of published research articles on library history published in the journal during 23 years. It revealed that more men than women published in library history. Carter (1991) examined in depth the content, changes and trends in *Cataloging and Classification Quarterly (CCQ)* 1980-1990. By and large, the author provided statistical analysis of the content, contributors, editors and noticed changes in the emphasis on topics. Over the 10 years, *CCQ* had reflected current needs and interests of both practitioners and theorists and that it is increasingly becoming international in scope. Anand's (1991) analytical study of the articles published in *CLIS Observer* 1984-1989 in terms of sources, contributions, authorship and citation patterns revealed collaborative authorship, leading contributors, geographical location of contributors, subjects discussed, referencing patterns and cited journals. He also compared the findings of his study with the results of other similar studies.

Subramaniam (1992) conducted a bibliometric study on *Library Science with a Slant to Documentation and Information Studies* (1981-1990) to identify the variation in content analysis, author-affiliations, single-authorship and membership of research centres.

Stephenson (1993) conducted a bibliometric and descriptive analysis of the *Canadian Library Journal* 1981-1991 to investigate the types of items, authorship characteristics, subject coverage, extent of research based articles and collaboration. Urbizagastegui (1993) studied the deve-

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lopment and contents of the *Bulletin of the Specialised University Libraries Association (ABUEN)* by examining its editorial policy, the content of the papers, author's occupation and nationalities and the extent to which these papers reflect the Nicaraguan Library field. It also examined the problems encountered by the *Bulletin* and suggested how they could be avoided.

In another study, Weinberg (1994) tried to assess the quality and impact of *Judaica Librarianship* on the library profession with particular reference to standard indicators of quality. The study revealed that *JL* meets all the standard criteria of periodical quality as indicated by its wide coverage by indexing services and citedness in other periodicals and books. *Scientometrics* was examined by Wouters (1994) on the occasion of the publication of its 25th volume, using bibliometric and social network analysis. The journal displayed the characteristics of a social science journal and the Price Index is remarkably stable over time. Most of the items published were single-authored. Nevertheless, the network of co-authorship is highly fragmented with most authors cooperating with no more than one or two colleagues. A study of the citation networks and network of title words indicate that a specific identity has developed.

Senapati (1995) presented a bibliometric study of articles appeared between 1988 and 1992 in *Studies in Conservation (SIC)*, the official publication of the International Institute for Conservation of Historic and Artistic Works. He analysed the papers according to year, language, institution, authorship pattern, subject areas, citations, length of articles and number of

illustrations. It was noted that most of the articles published in *SIC* are in English, with USA contributing the majority of the papers. As of single authorship, it accounted for 32.47%. It was also found that the average number of references was 13.88, illustrations 6.23 and the average length of papers was 8.47 pages.

One of the most recent studies on LIS journals is by Alemna (1996) who analysed 69 papers of the first 5 volumes of the *African Journal of Library, Archives and Information Science* 1990-1995. Some of aspects studied were status of the authors, gender, country of origin, and types of research. It also explored the type and origin of cited documents. The study reveals an increase in the number of publications from Africa, and also in the number of female contributors. It is noted that the major areas of interest are information technology, rural libraries and the status and image of librarians.

Bibliometric Studies of Medical Journals

One of the earlier bibliometric studies on a single medical journal is by Chen (1977) who reported a study on the subjects, length of articles and citations appended to 403 articles of *Bulletin of the Medical Library Association* 1966-1975. It was found that the subjects covered in the journal could be divided into 12 broad groups, the most popular being "library functions and services" (71 articles). Apart from that, it was found that the Journal itself has a self-citation rate of 25.3%.

Five years later, Vetlova (1982), studied 311 articles published in the Russian journal *Ortopediya i Travmatologiya (Orthopaedics and Accident Surgery)* 1976/7 found that 40% reported findings and were not up-to-date, too narrow in scope, not clearly structured and lacked clear conclusions and recommendations. The main reason behind this was that the authors were unaware of recent foreign work in their field as shown through citation analysis.

In 1989, Miyauchi analysed the contents of vol. 76, 1987 of the *Journal of Pharmaceutical Science (JPS)*, a core journal on pharmacy published by the American Pharmaceutical Association. He found that 65% of the authors were American and 60% were university-based.

Marias-Chapula (1992) through content and citation analysis of the journal *Educación Médica y Salud (EMS)* attempted to study the medical subject headings used in the medical education fields in Latin America. It was found that Brazil, Mexico and Colombia despite being strongly cited and citing countries, have not yet established significant information flow among themselves.

Davis (1996) aimed at tracking the progress of *Australian and New Zealand Journal of Family Therapy* (1990-1995) by analysing the contents of articles, and citation practice of authors. Through the study a picture of disciplinary influences operating in the field and the indication of the field's interdisciplinary reach were provided.

Bibliometric Studies on Other Science & Technology Journals

Gupta (1977b) studied the journal *Geliotekhnika* (1965-1975) in the field of solar energy. He attempted to study the various parameters of citation analysis having implications for library and information policy, and the growth and development of subjects in this field. "The main parameters studied are: rank list of journal titles; trends of research; scattering of information; types of publications cited; distribution of citations by area; self-citation; average number of citations per article and obsolescence of literature". Using the same journal, Gupta compared research efforts in the USSR and some English-speaking countries.

In the field of chemistry, Anand (1981) carried out an analysis of all the 1979 issues of *Journal of the Indian Chemical Society* to collect statistics on current Indian chemical research for future planning and financing; to provide a guide to future publication of research contributions; to ascertain the cost efficiency of journals subscribed to by Indian scientific institutions; and determine the use of journals in languages other than English. The study showed that out of the 12,000 chemical journals published throughout the world in the year concerned, only 408 were cited in the journal studied. It was further suggested that control of importation of little cited journals would help to increase savings in foreign exchange. Another study on a chemistry journal was carried out by Calafi (1986) who traced the development of analytical chemistry in Spain as shown in the Spanish chemical journal *Química Analítica* and compared

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articles published during two periods: 1974-1977 (202 articles) and 1982-1984 (85 articles). In the study, he looked at the number of authors and their parent institutions, references and citations. The study indicated that in the earlier period the field was dominated by a small number of researchers linked to particular university departments predominantly influenced by American sources but in the latter period, the number of productive researchers increased and diversified who were more open to European influence.

In geology, *Journal of the Geological Society of India*, vol. 21 1980 was studied by Raina (1983) to determine the research trends and output of Indian geologists. He also analysed aspects of time lag, citation pattern and geographical distribution of authors to ascertain the information needs and habits of Indian geologists. In the field of earth and soil sciences two studies were found relevant. Nag (1984) analysed the *Indian Journal of Earth Science* from 1974-1983 (volumes 1-10) and attempted to find out to what extent it represented the different branches of earth sciences and whether there was any shortage or concentration of articles in any particular field of interest. Patil (1985) studied the *Journal of the Indian Society of Soil Science* vol. 30, 1982 to determine communication patterns among Indian soil scientists. Some aspects analysed were the nature of the communication, geographic distribution, time lag, authorship pattern and frequency of journal citations.

In the field of engineering and allied sciences, Baburajan (1988) investigated bibliometrically 4 volumes of the *Institute of Electrical and Electronic*

Engineers Transactions on Computers on aspects such as nature and scope of papers, distribution by subject, source of contribution by country and institution, authorship pattern, currency and length of papers.

In physics, Garcia (1994) conducted a bibliometric study of the *Colombian Journal of Physics* 1984-1991 in trying to throw light on the nature of the scientific community and physics research in Colombia. The issues were analysed in terms of number of articles in each issue, number of citations, languages of articles, number of authors and collaborative pattern, number and type of research institutions and source of finance for the research. The study indicated the tendency of scientists to work in small, isolated groups with little or no communication between them.

In the field of agriculture, Majid (1995) analyses two volumes of the *Pakistan Journal of Agricultural Research* to investigate the trends in the publication of agricultural research literature, citation pattern, age of cited literature, frequently cited journals and the subject coverage of articles. He found that the average length of articles was 5.1 pages with 13.2 citations per paper. He added that 90% of the papers were published with joint authorship whereas the literature cited by Pakistani authors was old. The half-life of cited agricultural literature was about 11.5 years and the most preferred literature came from developed countries rather than the countries of the region. He also gave a ranking list of 20 most frequently cited journals.

Karki (1995) on the other hand, examined the bibliometric characteristics of industrial research activity in India by studying the journal *Research & Industry*. The study revealed that public funded R&D is the major contributor of research papers while the contribution of in-house R & D centres is lacking. It was also reported that much of the R & D activity had been in the field of chemical and allied industries as compared to a drop in R & D in engineering industries. The study concluded that the interface between R&D and industry was inadequate.

Bibliometric Studies of Journals in the Arts, Humanities, and Social Sciences

In the field of history, three studies were found to be relevant. Herubel (1990b) performed a study on *Journal of the Society of Architectural Historians (JASH)* to map its contributors and their institutional affiliations to provide valuable insight into the social nature of scholarly journal publication to bibliographers. Stephenson (1992) analysed 390 articles published in *American Archivist* 1971-1990 focusing his study on selected authorship and subject. The primary subject area receiving the highest level of coverage was the "General literature" category, followed by "Use of archives and historical manuscripts" and "Repositories" (History, Organisation and Activities). Single authorship (almost 90%) was the overwhelming pattern. Of a total of 433 authors, 124 (12.6%) were women compared to 309 (71.4%) men. It was also noted that academic archivists accounted for 22% of the authors while federal archivists for 16%. Herubel (1993) studied the trend in historical

scholarship and examined *The American Historical Review* for its content vis-à-vis periodisation, subject and geography to facilitate research and pedagogy.

In other fields in this category two studies are relevant. Vaishnav (1992) investigated the contents and objectives of the *Journal of Marketing* published by the American Marketing Association and determined the extent of its coverage, identified the emerging and declining subjects treated, evaluated the authoritativeness of the authors and offered suggestions for improvement. Pur-kayastha (1993) on the other hand, carried out a study of 4 issues of vol. 39, 1989 of the quarterly journal *Social Action* published from India. He attempted to find out the affiliation and geographical distribution of authors, authorship pattern and average number of references, the main bibliographical forms cited, the ranking of cited periodicals and the obsolescence rate of cited literature

CITATION ANALYSIS OF SINGLE JOURNALS

A total of 45 items were broadly grouped into this category from the grand total of 102 items retrieved from *LISA Plus* Spring 1997. Of these 45 items, 37 are in English, 4 in Russian, 2 in Portuguese and 1 each in Hungarian and Chinese. Also, of the 45 items, 41 are journal articles and 2 each are papers presented at conferences (published in book form) and research reports. All these 45 items present the results of citation analysis. As to subject-wise distribution of journals studied, 9 are on Library and Information Science, 16 on Science, Technology, and Medicine

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and 10 on Arts, Humanities, and Social Science.

Citation Analysis Studies of Library and Information Science Journals

One of the earliest citation analysis studies on a single LIS journal was carried out by Lehnus (1971), who studied the *Journal of Education for Librarianship* 1960-1970. Kundu (1980) studied the citations appearing in 22 volumes of the *Annals of Library Science* (later renamed *Annals of Library Science and Documentation*) 1954-1975. The results show that out of the total 1,545 citations, 217 relate to Indian journal articles and 350 relate to foreign journal articles. Of the Indian periodicals *Annals of Library Science* was cited most accounting for 48.4% of the Indian journal citations while *American Documentation* was the most cited foreign periodical accounting for 12% of the total foreign journal citations.

Montenegro de Lima (1984) reported a cito-analytical study of *Scientometrics* 1978-1982 using Bradford's law. The 22 issues covered produced 294 titles and 1164 citations. The distribution showed 1% of titles produced 25% of citations, with a nucleus of 20% of titles producing 80% of citations. Data analysed showed USA accounted for 52% of the titles country of origin.

Vaishnav (1990) conducted a study of citations by articles appearing in *Herald of Library Science* describing special numbers, special features, indexing, abstracting and status of the journal.

Articles published in *Journal of the American Society for Information Science*

(*JASIS*) was the subject of two studies. Hooten (1991) examined factors which may explain the frequency and nature of use of documents in citing documents texts over time with articles published in *JASIS* during 1972-1974 through a search on Sci-Search. Persson (1994) did a co-citation analysis of 209 articles published in the *JASIS* between 1986-1990 to find the intellectual base of these articles. A map of the most co-cited authors shows considerable resemblance to a map of information science produced by other methods. Citation-based bibliographic coupling was also applied to the same set of documents in order to define research fronts and the result shows that the research front map has a close correspondence with the map of the intellectual base.

Gerasimov (1992) conducted a citation analysis of 4,480 original articles published in *Nauchno-Tekhnicheskaya Informatsiya* and found that the average citations per paper was 2.43, considerably higher than that quoted by E. Garfield for American publications.

Haddad (1988) attempted a citation study on the most well-known Arabic journal in the field of library and information science, *Alam Al-Kutb* 1400-1410 AH [1978-1988 AD]. A complete citation analysis of 79 studies published contained 1,745 citations of which 99% were in Arabic and other European, Russian and Turkish languages including English which accounted for only 1%! Subject scatter was also analysed. In another related study on the same journal, Haddad investigated its textual significance compared to other periodicals in the field.

The linguistic features and books cited in the studies were recorded too. The study brought to light the most cited authors and the most cited periodicals in *Alam Al-Kutub*.

Citation Analysis Study of Journals in Medicine

In 1978 Brennen analysed the citations in *Tropical Diseases Bulletin* (1972-1975) according to the journal in which they were published and the language in which they appeared. The results conformed to Bradford's law where the reference scattering coefficient was determined to be 0.504 indicating a high concentration of articles in relatively few journal titles. The study also showed English to be the most important language in terms of productivity and could be used to build up a collection on tropical medicine.

Kovacs (1981) studied the Journal published by the Hungarian Association of General Practitioners, the *Medicus Universalis* 1979 in terms of number, type and language of references used by the authors. Of the 77 articles, 55 reports contained 1,115 citations of which 353 referred to reports published in Hungarian and 762 to papers published in foreign languages. References to journal articles predominated with 815 (73%) citations, and was followed in decreasing order by books and other documents. The top three countries in terms of productivity are Hungary (353), USA (237) and UK (194); whereas in terms of language distribution English tops with 475 citations followed by German (225 citations). A negligible amount of citations goes to other languages.

Rytkinskii, also in 1983 carried out a citation analysis of articles published in a medical journal to identify new trends in research concentrating on the years 1960, 1970, 1975 and 1980. A total of 1,225 articles having 9,043 references were analysed. He concluded that the results pointed towards fields where a development of new research trends is to be expected. Lazarev (1983) conducted a study using the journal *Problems of Haematology and Blood Transfusion* to determine the core journals on haematology through citation analysis.

Chievananin (1984) examined the characteristics of literature sources cited by Philippine biomedical researchers. Form of publication, country of publication, language, age and scatter of journal citations over journal titles were studied using the *Acta Medica Philippina (AMP)* 1977-1981. The results show that journal citations accounted for 81.5%, about 48% of the journals and over 63% of the non-journal materials cited came from USA, and English language materials were the most frequently cited. The age distribution of journal citations ranged from 0-141 years, with a median age of 10 years while 90% of the total citations were 3-39 years old. It was found that the scatter of citations over journal titles conformed to Bradford's law. A comparison of the 66 frequently cited journals with the holdings of the University of the Philippines Medical Library indicated that the latter served authoritative sources.

Zhang (1987) investigated the theory of half-life using the *Chinese Medical Journal* as an example. Calculations based on Bradford's law and the proposed 'once

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citation' analysis are applied as a means of evaluating periodicals in libraries in China.

Gupta (1991) tried to investigate the characteristics of citations as indication of usage of information sources for medical research in Ethiopia and to determine the half-life of medical literature in Ethiopia in different periods. The study was based on a citation analysis of articles appearing in the *Ethiopian Medical Journal* 1977-1987. It was found that the half-lives for 1977 and 1987 to be 5.9 years and 11.0 years respectively. It also established his hypothesis to be true that the use of information sources in developing countries varies from time to time depending upon the specific problems of research, available facilities and researchers at a specific time or period. On the other hand, Sengupta (1991) attempted to find out the importance of all articles published in a particular year of a speciality journal, *Cancer*. Through bibliometric analysis, aspects such as time lag between publication and first citation of articles, average citation time, subject scattering and identification of most important journals in the field have been studied.

Citation Analysis of Journals in Science & Technology

In the field of chemistry 4 studies were found to be relevant. Ghosh (1974) studied the uncitedness of articles in the *Journal of the American Chemical Society* to investigate the extent to which predictions on uncitedness hold true in the discipline. In another study (1975), he also studied *Nature*, a multi-disciplinary

scientific journal on the same aspect of uncitedness. He provided tables showing the distribution of 327 test papers according to types, distribution of uncited test papers by year and type and distribution of continuously uncited test papers by year and type.

Bottle (1987) investigated biochemical periodical literature in the light of its ageing phenomena as reflected by the citations in *Cell* 1983. He found that the citation frequency followed a negative exponential distribution for 1972-1982, with the median citation age of 3 years. He also tested the relationship between ageing and content typologies and established that the median citation age of different typologies were uneven, with the differences of nearly 7 years indicating that content typologies were an important factor affecting the ageing phenomena of the literature.

Yitzhaki (1991) checked a large sample of papers published in the *Journal of Biological Chemistry (JBC)* to study the referencing pattern for the period 1910-1985. The result shows a significant growth in the number of references per paper during most of the period but mainly from the 1950's on, refuting Meadows 'upper limit'. A detailed comparison with a wide range of subject fields shows the *JBC* rates to be among the highest.

In the field of engineering and its related fields two studies were retrieved. Gupta (1978) studied *The Journal of the Structural Division of the American Society of Civil Engineers*, New York 1974 to ascertain the active life of periodicals in structural engineering after taking into consi-

deration the ageing factor, obsolescence factor, half life, mean life and utility factor on the basis of citations in periodicals. The paper concluded that periodicals in structural engineering lose their utility value after 8 years of their publication. Kumbar (1992) examined 302 articles containing 6,370 citations published in the *Journal of Fluid Mechanics* to explain citation analysis methodology and its application. The citations were analysed in terms of distribution by form, scattering by country, distribution by language and chronology. He also ranked the most frequently cited periodicals.

In the field of geology and allied sciences two studies were found to be relevant. Lifshin (1993) reported a citation analysis of the *Geochimica et Cosmochimica Acta* 1951-1960. It was found that 75% of the citations were journal articles followed by books and continuations. English language citations dominated in 1960 with a corresponding decrease in German language citations. Citations to the geologic literature dominated and increased with time from 40% to 58% while citations to the journal itself grew from 2 to 357 within ten years. Lal in 1993 analysed 6273 references contained in the *Journal of Indian Society of Soil Science* 1985-1988 to generate a ranked list of journals. He wanted to find out the principal type of documents used, compared the first 30 ranked journals of the present list with that of 3 previous listings in order to establish research trends, identified the countries the journals of which were of interest, determined the chronological scattering of all cited literature and ascertained the degree of use made of fo-

reign and Indian theses. On the other hand, Payne (1993) in her paper presented at a conference, conducted a citation analysis using the journal *Computers & Geosciences* to determine whether articles published in specialist geoscience periodicals are well cited and well used. It was revealed that the periodical was cited more than was anticipated and that more authors outside the geoscience field cited the journal than was expected. Deshmukh (1982) in a related study attempted to find out the important Indian and foreign journals in the field of soil conservation basing the citations appended to the *Indian Journal of Soil Conservation* (formerly *Soil Conservation Digest*) 1973-1980.

Relevant studies belonging to other fields in this category are as follows. Gupta (1977a) discussed the comparative merits of three citation analysis techniques namely direct citation, co-citation and bibliographic coupling and used the co-citation mode to study a sample of papers published in the USSR periodical *Gelioteknika*. He established through the study that co-citation is indeed the most suitable technique to find the networking patterns of scientific papers. On the other hand, Burbulya (1978) studied the citation rates on the basis of 337 mathematical articles published in 36 issues of *Doklady Akademii Nauk SSSR* 1975. In the study, Burbulya investigated the distribution of citations by number of authors per article and distribution of articles according to number of references to Soviet and foreign articles, self-citations and ageing of articles and books in the field of mathematics.

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Nagappa (1982) analysed all the citations appended to 161 articles published in the *Journal of Plant Physiology* 1976-1979 to identify the periodicals most frequently cited by Indian plant physiologists. The study also provided a list of 39 periodicals cited more than 10 times, types of publication cited and their quantitative data, coun-try-wise distribution of cited periodicals, chronological scattering of citations and a selected list of areas.

Ali (1983) reported the results of a bibliometric study of the *Journal of Food Science and Technology* to determine the core list of significant periodicals in the field. He also gave some recommendations for selective acquisition of relevant jour-nals. In the same year Maheswarappa ana-lysed the citations contained in *Phyto-morphology* 1975-1979. In the study, attempts were made to identify the princi-pal bibliographical forms, frequently cited periodicals, their productivity, geographi-cal distribution, obsolescence and scatter-ing of research literature used by phyto-morphologists. It was hoped that such ana-lysis would prove useful to librarians in the selection and acquisition of documents to meet the present day needs.

In the field of Geophysics, Gupta (1984) analysed the citations of *Geophysics* 1980. He found the distribution of citation frequencies was exponentially negative and the average half-life of the literature is 9.4 years.

Alabi (1989) studied the pattern of communication amongst Nigerian scientists in relation to their counterparts from other

parts of the world, whether the ratio of papers without references to papers with references should determine the scholarliness of the published articles devoted to different fields of knowledge against those devoted to a single subject field and the correlation between the journals cited by Nigerian scientists with those cited by scientists elsewhere. The study was based on the citation analysis of the *Nigerian Journal of Science*.

Van der Heij (1990) studied the reader's be-haviour towards full papers and synopses published in the *Netherlands Journal of Agricultural Science (NJAS)* 1984-1986. It was found, on an average citation yields were significantly lower for synopses than for full papers. The citation yields varied strongly between 3 years.

Citation Analysis of Journals in the Arts, Humanities, and Social Sciences

In the field of psychology two studies were found to be relevant. The citations in psychology journal, *Journal of Educational Psychology* 1960-1970 were studied by Cronin (1980) to find out the citation habits in psychology. The result showed that the relationship between citation habits and the volume of literature available for citing is not very close. On the other hand, Ijary (1990) analysed 3 volumes of *Indian Journal of Child Psychology* to identify the periodicals cited by most Indian clinical psychologists. He also prepared a list of 46 journals each having been cited at least 5 times.

In the field of history, McCain (1987) studied the citations of a sample of 27 historical and historiographic articles from

Technology and Culture 1967-1977 in order to study the distribution of secondary source citations across disciplinary boundaries. It was found that 47% of the citations were to secondary sources. She also compared the citation patterns with studies of literature use in history of science, general history, literature studies and musicology as well as with multidisciplinary cross-boundary citation studies in the social sciences. Hitchcock (1989) on the other hand examined the footnote appearing in the 1986 issues of *Tennessee Historical Quarterly* to determine materials of use to library users searching for information on US state history. Herubel (1991b) through a citation study of the 1989 volume of the *Journal of Garden History* revealed patterns of research materials which demonstrate garden history's place in the bibliographic context of materials used in mainstream historical publication. Goedecken (1995) seeking to discover the role played by periodicals in the dissemination of historical scholarship examined the contents of article bibliographies published in the *Journal of American History*. In the process, the titles of the most prominent periodicals and changes in historical scholarship were identified.

In the field of education, Sievert (1989) carried out an analysis of citation data of *Elementary School Journal* to study the influence of an editor on citation patterns. The study examines the editorial goals of each of the 3 editors in a 10-year period and found that while they agreed on several positions, the current editor stressed research more and was interested in rapid communication. The results showed chan-

ges in number of citations the journal received, the number of citations given, the immediacy index and the impact factor. There exists a positive impact between an editor and citation patterns of the journal studied. Another study by Fiuza (1995) who analysed citations of French and French-speaking authors in articles published in *Revista Brasileira de Estudos Pedagógicos* 1944-1990 to investigate the influence of French educational theory on Brazil. The results indicate that the French influence was strongest in the 1980s, chiefly in the field of educational psychology of children through the work of Piaget.

Mack (1991) conducted a citation analysis of women's studies literature to determine the most frequently used scholarly journals and to discover which subject disciplines were consistent in contributing to the published literature as indicated by the journal *Signs: Journal of Women in Culture and Society*. 1,266 citations from the journal was analysed resulting in 20 titles which comprised a core collection of women's studies journals, and 11 subjects areas which were used consistently.

Wheeler (1993) through citation analysis charted the growth of *Urban Geography* and the recent flow of communication into and out of the journal.

CONTENT ANALYSIS OF SINGLE JOURNALS

Literature reviewed under this category comprises studies devoted to content analysis of a single journal. In all, 11 articles are devoted to content analysis of which 10 were published in English and 1 in

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Afri-kaans. All the 11 items are journal articles. As to subject-wise distribution of journals, 7 are on Library and Information Science, one on Science, Technology and Medicine and three on Arts, Humanities, and Social Science.

Content analysis of Journals in Library and Information Science (LIS)

About six studies analysed the contents of single journals in LIS fields. Goldhor (1981) carried out content analysis on 85 articles obtained from a sample of 12 issues of *Library Journal* 1958-1980 to determine the subject matter, type of library described, and characteristics of authors. He noticed the trend towards fewer articles occupying a smaller fraction of the total number of pages and the subjects are less concerned with library materials and administration and more concerned with professional organisations. Another trend is towards a greater emphasis on advertisements and book reviews. Schrader (1989) carried out content analysis of articles published in *Public Library Quarterly (PLQ)* 1979-1984. The study found *PLQ* to be a scholarly journal with two-third of its articles containing bibliographic citations and the high reliance of its authors on periodicals for their citations.

De Bruin (1990) reviewed the most important trends in the development of the *South African Journal of Library and Information Science* 1984-1988. The journal has changed from a medium which provided a platform for an exchange of views between professionals and served as a mouth-piece of the South African Institute for Librarianship and

Information Science to a scientific journal. The study illuminates the nature of the content of the journal, sources of contributions, research methods, literature references, subject coverage, balance between languages, authorship, technical aspects and time lapse before publication.

Rice (1990) assessed the adequacy of the library news coverage and analysed the contents of 661 library-related articles published in the *Chronicle of Higher Education* 1966-1988. The results showed that although coverage has increased dramatically over the past 25 years, the focus tends to be elitist. Nevertheless, the journal remains a significant source of academic librarianship for the higher education community.

Herubel (1994) examined the bibliographic essays appearing in *Journal of Library History* (renamed *Libraries and Culture*) 1986-1990 to study the disciplinary nature of periodicals containing articles devoted to American library history. The essays yielded 203 individual periodical titles and 1030 bibliographic citations. Each periodical title was examined for disciplinary affiliation and categorised accordingly. The 20 most cited periodicals in the field of library history was shown. On the other hand, Arp (1994) examined the topics covered by the regular Library literacy column in the periodical *RQ* focusing on the range of topics related to library and information science training.

Parker (1995) studied the journal *Information Development* 1985-1994 to describe the coverage of the periodical in terms of developing country issues, regular features

and special issues, geographical coverage, authorship and subject coverage.

Content Analysis of Journals in Science, Technology and Medicine

Kryzhanovsky (1988) analysed the content of articles on or relating to electricity that appeared in the *Philosophical Transactions of the Royal Society of London* (1665-1800). The views of eminent scientists of the 18th century of the scientific advance, state of the art and prospects in electricity are given and commented.

Content Analysis of Journals in the Arts, Humanities and Social Sciences

Only three studies reported the content analysis of journal in the above mentioned fields. Obokoh (1989) analysed articles published in the *Nigerian Geographical Journal* 1957-1978, and found out the areas of research interest of Nigerian geographers. It was found that generally Nigerian geographers tend to follow worldwide research patterns shifting from the traditional geographic areas into the applied areas. Herubel (1990a) examined the socio-ogical structure of a disciplinary journal, *Man and World* and revealed features which permit a greater appreciation of at-tributes of the journal's development. Cox (1994) analysed the contents and coverage of the periodical *American Archivist* 1970-1992, from the viewpoint of its coverage of issues relating to archival research to ascertain its role and function.

OTHER ASPECTS OF BIBLIOMETRIC STUDY ON SINGLE JOURNAL

Under this category falls the body of literature which studies other aspects of bibliometric analysis not covered by the previous three categories. This body of literature is considered special and interesting because they highlight other aspects of bibliometric studies. On the whole, only 6 such items were retrieved, all of which are journal articles published in English. From the subject-wise distribution of journals, five are on Library and Information Science while one is of Arts, Humanities, and Social Science.

Study of Journals in Library and Information Science

The five studies found to be relevant to this section are as follows. Tate (1981) in using the same criteria to study the characteristics of 5 library periodicals in an earlier project, applied it to the authorship study of *Library Resources and Technical Services*. Harter (1990) studied the relationship between funding, citation rates and other variables in a sample of information science articles published in *Journal of the American Society for Information Science (JASIS)* 1972-1974. Among others, the findings showed that there was no evidence that funding has anything to do with how often articles are cited, funded research tends to be much more stable, consistent and predictable than non-funded research; articles reporting applied or theoretical research are much more likely to be cited than other articles appearing in *JA-SIS*; library school faculty members are more likely to be cited than any other group publishing in *JASIS* although they are less likely than any other group to have received funding.

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Using the same journal Cronin in 1991 explored the social function and cognitive significance of acknowledgements. She developed a 6 category citation analysis typology and applied it to 444 acknowledgements carried by research articles in *Journal of the American Society for Information Science* 1970-1990. She also proposed that acknowledgements and citations be used conjointly in the assessment of research performance and disciplinary interpretation.

Hernon (1993) on the other hand examined the characteristics of authorship, editorial decisions and reviewer assessments for accepted and rejected papers for *College and Research Libraries (CRL)* based on over a decade of internal records. It was found that *CRL* editors and reviewers conducted their work without major disagreement or rancour. Refereeing has indeed served the periodical's readership well. Nisonger (1996) analysed the authorship pattern in *Library Acquisitions: Practice and Theory* 1979-1995. The study found that 80.6% of authors contributed a single article while 3.9% wrote four or more; 15.6% of the articles were collaboratively written by 2 or more authors, 65.4% of authors were academic librarians and 10.6% were vendors, 53.9% were male. The longitudinal analysis shows an increasing portion of female authors, and 15.3% of authors were from outside the US.

Study of Journals in the Arts, Humanities and Social Science

Olleson (1996) drawing on evidence contained in his letters, showed that the composer and organist Samuel Wesley (1766-1837) was the main, if not the sole author of the anonymous column, impartial and critical reviews of musical publications, which appeared in the *European Magazine* (Feb 1814-Dec 1816). He also discussed the content and style of these reviews and identified other signed and unsigned contributions by Wesley to the *European Magazine* and canvassed the likelihood of his authorship of other anonymous articles.

CONCLUSIONS

The above literature review covering the years 1969-Spring 1997 showed that there are substantial bibliometric studies on individual learned journals published in all parts of the world, especially in the US, Europe and India. The country-wise distribution of journals indicated that the US topped the list with 50, followed by India 20, Russia 8, Netherlands and United Kingdom 3 each, Nigeria, Saudi Arabia and South Africa 2 each, and Australasia, Brazil, Canada, Chinese People's Republic, Columbia, Ethiopia, France, Hungary, Nicaragua, Pakistan, Philippines, and Spain one each. From the subject-wise distribution of journals, it is found that 42 are devoted to Science, Technology and Medicine, 41 on Library and Information Science and 19 on of Arts, Humanities and Social Sciences. Hence, it is quite clear that bibliometric studies on other fields especially in the field of the Arts, Humanities and Social Sciences are still not satisfactory

It is quite obvious that in this part of the world, South East Asia, especially Malaysia, there is no evidence of any significant bibliometric study on a single learned journal. Studies from ASEAN region, if available, have often focused on other aspects of bibliometrics, namely, bibliometric analysis of agricultural literature in Malaysia (Nasir, 1994), bibliometric analysis of Islamic economics literature (Rehman, 1994), scientific output of the scientific communities of 4 Asian countries (Davis, 1989) and scientific productivity in ASEAN countries (Arunachalam, 1986). Therefore, in view of the non-existence of a comprehensive study dealing with Malaysian as well as ASEAN journals, single journal bibliometric study involving the journals of this region becomes worthwhile.

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