CHAPTER TWO

LITERATURE REVIEW

Introduction

This study aims to survey the bibliometric studies conducted with a single scholarly journal in the world since 1969 till date. The body of literature on the topic was searched from 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) which cover a wide range of publications on all aspects of library and information science literature from all over the world. Moreover, all important bibliometric studies conducted in the world are reflected in LISA Plus. Library Literature was not searched because no abstract is given making the search difficult and troublesome. Apart from that, some journals of concern are not available in Malaysia. 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 study and journal, bibliometrics study and journals, bibliometric study and periodical, bibliometrics study and periodicals, citation analysis and journal, citation analysis and journals, citation analysis and periodical, citation analysis and periodicals, content analysis and journal, content analysis and journals, content analysis and periodical, content analysis and periodicals, authorship and journals, authorship and journal, authorship and
periodicals and authorship and periodical. 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:

1. Bibliometric study on single journals (40 items)
2. Citation analysis of single journals (45 items)
3. Content analysis of single journals (11 items)
4. Other aspects of bibliometric study on single journals (6 items)

**Bibliometric Study on Single Journals**

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; conference paper, summary of study at a poster session, and project paper from CRLIS, one each. From the subject-wise distribution of journals, 20 were on Library and Information Science, 15 Science, Technology, and Medicine and 5 Arts, Humanities, and Social Science.

**Library and Information Science**

One of the earliest bibliometric study on single LIS journal is Meadow and Zaborowski (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. They also noted the processing time, production time and discussed about the need for cutting down those times for better dissemination of information. Thirteen years later, Harter and Hooten (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.

Before that, Lajeunesse and Wilson (1981) reported the results of an analytical study of the contents of the French-language Canadian journal, Documentation et Bibliotheques (formerly Bulletin de l'ACBLF), from its first appearance, 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) while updating selected aspects of Cline's analysis through volume 49, 1988, tried to determine whether the trends discerned in authorship and referencing practices had continued and to assess the degree to which the journal had published quantitative research throughout its long history. Metz found that there was a dramatic increase in the use of quantitative techniques in those 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. It was found between 1989 and 1994, representation by academic librarians and authors affiliated with library schools increased, collaboration became predominant, and for the first time the number of primary women authors equalled that of men. But, taking into consideration all co-authors, female authors outnumbered men. Most of the contributing female authors were academic librarians who co-authored articles.

Alekseeva (1983) examined many topical problems of Russian journal *Sovetskaya 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 conducted a study to describe and evaluate 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 and Mohanta conducted a study with the articles published in IASLIC Bulletin between 1984-1988. The objectives of the study were to determine; the year-wise distribution of papers; the proportion on 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 attempting 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
published research on library history analysing the articles published in the journal during 23 years. It revealed that more men than women published in library history. Carter and Kascus (1991) examined in depth the content, changes and trends in *Cataloging and Classification Quarterly (CCQ)* 1980-1990. By and large, the authors provided statistical analysis of the content, contributors, editors and noticed changes on the emphasis on topics which indicated that CCQ over time 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.

Next, Subramanian and Navaneethan (1992) conducted a bibliometric study on *Library Science with a Slant to Documentation and Information Studies* 1981-990 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 development 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.

Weinberg (1994) in another study 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. Next, Wouters and Leydesdorff (1994) using bibliometric and social network analysis examined Scientometrics on the occasion of the publication of its 25th volume. 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.

**Medicine**

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 in 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), in her study on 311 articles published in the Russian journal *Ortopediya i Travmatologiya* (*Orthopaedics and Accident Surgery*) 1976/7 found that 40% of them reported findings which were no longer 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.

Later on, Miyauchi, Miyasaka and Sasakawa (1989) 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. It was found that 65% of the authors were American and 60% were university-based.

Marias-Chapula (1992) through content and citation analysis of the journal *Education·Medica 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 and Lipson (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 was provided and the indication of the field’s interdisciplinary reach.

**Other Science & Technology Disciplines**

Gupta (1977b) attempted to study the various parameters of citation analysis having implications for library and information policy, and the growth and development of subjects using Soviet articles in the area of solar energy published in the Russian journal *Geliotekhnika* during 1965-1975. "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". Gupta also compared research efforts in the USSR and some English-speaking countries, the results of the first two parameters in his study.

Anand (1981), carried out an analysis covering all the 1979 issues of *Journal of the Indian Chemical Society* to collect statistics on current Indian chemical research for future planning and financing; providing a guide to future publication of research contributions; ascertaining the cost efficiency of journals subscribed to by Indian scientific institutions; and determining 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.

Raina (1983) using *Journal of the Geological Society of India*, vol. 21 1980 studied 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.

Nag (1984) analysed the *Indian Journal of Earth Science* from 1974-1983 (volumes 1 -10) and attempted to find out to what extent it is representative of the different branches of earth sciences and whether there is 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 of the aspects analysed were the nature of the communication, geographic distribution, time lag, authorship pattern and frequency of journal citations.

Calafi et al. (1986) conducted a study to trace the development of analytical chemistry in Spain as shown in the Spanish chemical journal *Quimica Analitica* by comparing articles published during two periods: 1974-1977 (202 articles) and 1982-1984 (85 articles). In the study, they
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.

Baburajan (1988) in his study on the importance of scientific journals as a primary source of current information in the field of Engineering and Allied Sciences, 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.

Garcia (1994) in trying to throw light on the nature of the scientific community and physics research in Colombia, conducted a bibliometric study of the *Colombian Journal of Physics* 1984-1991. 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.
Majid (1995) on the other hand investigated the trends in the publication of agricultural research literature, citation pattern, age of cited literature, frequently cited journals and the subject coverage of articles by analysing two volumes of the Pakistan Journal of Agricultural Research. 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 and Garg (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.

Arts, Humanities, and Social Sciences

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 (28.6%) 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%. Vaishnav (1992) on the other hand, investigated the contents and objectives of the *Journal of Marketing* published by the American Marketing Association, determined the extent of its coverage, identified the emerging and declining subjects treated, evaluated the authoritativeness of the authors and offered suggestions for improvement.

Herubel and Goedeken (1993) in trying to study the trend in historical scholarship, examined *The American Historical Review* for its content vis-à-vis periodisation, subject and geography to facilitate research and pedagogy. Purkayastha (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 presents the results of citation analysis. As to subject-wise distribution of journals studied, 9 are on Library and Information Science, 16 Science, Technology, and Medicine and 10 Arts, Humanities, and Social Science.

Library and Information Science

One of the earliest bibliometric studies on a single LIS journal was carried out by Lehnus (1971). He did an analytical study on 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 1545 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 with 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 title country of origin.

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

Hooten (1991) examined factors which may explain frequency and nature of use of documents in citing documents texts over time with articles published in *Journal of the American Society for Information Science (JASIS)* during 1972-1974 through a search on SciSearch. Persson (1994) did co-citation analysis to 209 articles published in the *Journal of the American Society for Information Science* 1986-1990 to find the intellectual base of these articles. A map of the most cocited 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) in conducting a citation analysis of 4,480 original articles published in *Nauchno-Tekhnicheskaya Informatsiya* found that the average number of citations per paper is 2.43, considerably higher than that quoted by E. Garfield for American publications.

Haddad (1992) 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 and Mahmood (1993) 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*.

**Medicine**

In 1978 Brennen and Davey 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 of 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.

Rytvinskii, 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.
Chievnavin (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 showed 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 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 and Henzler (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.

**Science & Technology**

Ghosh and Neufeld (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 of chemistry. In another study (1975), Ghosh 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.

Gupta (1977a) discussed about 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 and Kovarskaya (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, they 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. Gupta, Krishanlal and Ravindran (1978) carried out a study with 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 consideration 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.

Nagappa and Maheswarappa (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, countrywise distribution of cited periodicals, chronological scattering of citations and a selected list of areas. Deshmukh and Kumar (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 in

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 journals. In the same year Maheswarappa analysed the citations contained in *Phytomorphology* 1975-1979. In the study, attempts were made to identify the principal bibliographical forms, frequently cited periodicals, their productivity, geographical distribution, obsolescence and scattering of research literature used by phytomorphologists. It was hoped that such analysis would prove useful to librarians in the selection and acquisition of documents to meet the present day needs.

Gupta (1984) analysed the citations of *Geophysics* 1980. The distribution of citation frequencies is found to be of negative exponential nature while the average half-life of the literature is 9.4 years.

Bottle and Gong (1987) investigated biochemical periodical literature in the light of its ageing phenomena as reflected by the citations in *Cell* 1983. They found that the citation frequency followed a negative exponential distribution for 1972-1982, with the median citation age of 3 years. They 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.

Alabi (1989) conducted a study to find out the pattern of communication of 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 et al. (1990) studied the reader's behaviour towards the synopsis. Both full papers and synopses published in the Netherlands Journal of Agricultural Science (NJAS) 1984-1986 were considered for the study. 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.

Yitzhaki and Ben-Tamar (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.

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.

Lifshin (1993) reported a citation analysis of the *Geochimica et Cosmochimica Acta* 1951-1960. It was found that 75% of the citations were of journal articles followed by books and continuations. English language citations dominate in 1960 with a corresponding decrease in German language citation. Citations to the geologic literature dominate and increase with time from 40% to 58% while citations to the journal itself grow 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 hoped to find out the principal type of document used, compared the first 30 ranked journals of the present list with that of 3 previous lists 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 foreign and Indian theses. On the other hand, Payne and Merriam (1993) in their 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.

**Arts, Humanities, and Social Sciences**

Cronin (1980) studied the citations appearing in the pages of *Journal of Educational Psychology* 1960-1970 to provide some reflections on 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 and Kannappanavar (1990) analysed 3 volumes of *Indian Journal of Child Psychology* to identify the periodical most profusely cited by Indian clinical psychologists. They also prepared a list of 46 journals each having been cited at least 5 times.

McCain (1987) in a paper presented at the ASIS 49th Annual meeting, reported the results of a citation analysis of a sample of 27 historical and historiographic articles from *Technology and Culture* 1967-1977 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 clearly demonstrate garden history's place in the bibliographic context of materials used in mainstream historical publication.

Goedeken and Herubel (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 were identified. The changes in historical scholarship as reflected in these periodicals were also investigated.

Sievert and Houghawout in 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 changes 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.

Fiuza, Pittella and Drummond (1995) on the other hand analysed citations of French and French-speaking authors in articles published in *Revista Brasilierea de Estudos Pedagogicos* 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 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 bibliometric studies devoted to content analysis of a single journal. All the 11 articles
are devoted to content analysis of which 10 were published in English and 1 in Afrikaans. All the 11 items are journal articles. As to subject-wise distribution of journals, 7 are on Library and Information Science, one Science, Technology and Medicine and three Arts, Humanities, and Social Science.

Library and Information Science

Goldhor (1981) carried out content analysis on 85 articles obtained from a sample of 12 issues of Library Journal 1958-1980 to determine 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 and Beswick (1989) attempted to describe and evaluate key bibliometric patterns in the articles published in Public Library Quarterly (PLQ) 1979-1984. The study established 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, Gericke and Van Zyl (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 mouthpiece 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 and Paster (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 library information for the higher education community.

Herubel and Goedeken (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, authors and authorship and subject coverage.

Science, Technology and Medicine

Kryzhanovsky (1988) analysed contents of the 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.

Arts, Humanities and Social Sciences

Obokoh (1989) examined 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) in trying to examine the sociological structure of a disciplinary journal chose Man and World to reveal features, which permit a greater appreciation of attributes 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 Journals**

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 the various aspects of bibliometric studies even though lesser in number but deserve special attention. 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.

**Library and Information Science**

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 and Hooten (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. 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 JASIS; 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. Using the same journal Cronin in 1991 explored the social function and cognitive significance of acknowledgements. He 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. He 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) on the other hand analysed authorship in Library Acquisitions: Practice and Theory 1979-1995. The study finds 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.

**Arts, Humanities and Social Sciences**

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.

**Conclusion**

The above literature review covering the years 1969-Spring 1997 showed that there are substantial bibliometric studies on individual learned journals in all parts of the world, especially in the US, Europe and India. The countrywise 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 of the Science, Technology and Medicine, 41 on Library and Information Science and 19 on Arts, Humanities and Social Sciences.
Hence, it is quite clear that bibliometric studies on other fields apart from Science, Technology and Medicine, and Library and Information Science are still not satisfactory especially in the field of the Arts, Humanities and Social Sciences.

It is quite obvious that in this part of the world, SouthEast 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, the non-existence of comprehensive study dealing with Malaysian as well as ASEAN journals, single journal bibliometric study involving the journals of this region becomes worthwhile.