CHAPTER 2

REVIEW OF RELATED LITERATURE
Review of Related Literature

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Review of Related Literature

Purpose of this chapter is to focus on the scanned literature on bibliometrics, literature use pattern, citation analysis etc.

2.1 Introduction

New achievements are daily made in the evergrowing universe of knowledge. Unless we relate the new to old, no one is going to accept the newness of the work.

Review of related literature forms an integral part of any research. It helps to find out what is already known and what is still unknown and untested. It also helps to avoid the duplication of the research. A care scanning of the literature related studies will help the researcher to understand the studies of similar nature and the methodology followed. In the present study large number of related studies have been reviewed through some books and more journal articles. In order to identify similar studies, LISA was searched. Bibliographies, Dictionaries, Glossaries, Encyclopaedias these basic tools are also used to define the conceptual terms.

At the outset to formulate the problem and to check whether the research has completed on the formulated problem, the bibliographies of AIU (1997), Pathak Vijay and Ramaiah L.S.R (1986), Kumar P.S.G (1987) have scanned as these cover the research conducted in the field of Library and Information Science.

2.2 Definitional Analysis

To define the key words in research topic viz: Bibliometrics, citation analysis, literature use pattern, Encyclopaedia of Library and Information science (1998), books of Mahapatra (2000), Devarajan G. (1997), articles of Maheswarppa (1997) have been used.

2.2.1 Bibliometrics

Bibliometrics is a well established discipline for a quantitative study of the various aspects of literature for a given subject. In almost all subject disciplines bibliometric research has developed a body of theoretical knowledge and a group of techniques and applications based on the distribution of bibliographic data elements. It has been found that one fourth of all the articles published in Library and Information Science periodicals are on bibliometrics and its related topics.

The Bibliometrics is analogous to Ranganathan's, 'Librametrics', Russian concept 'Scientiometrics', FID's 'Informetrics' and also to some other well established subdisciplines like 'Econometrics', 'Psychometrics', 'Sociometrics' and 'Biometrics' where the mathematical and statistical calculus have been systematically applied to study and solve that problems in the field of Library science, History of science, Information science, Economics, Psychology, Sociology and Biology respectively.

Study of Cole and Eale (1917) is considered the first bibliometric study where the expression 'Statistical Analysis' has been used. Hulme (1923) was the first to use the expression 'Statistical bibliography' study of Gross and Gross (1927) is considered to be the third study in the field based on citations. After Hulme, the term Statistical bibliography is used by Henkle (1938), and Gosnell (1944) in
their articles. Later Fusseler (1949), Raising (1962), Barker and Prichard have used the term 'Statistical Bibliography.' Prichard (1969)) suggested the word 'Bibliometrics' in preference to Statistical Bibliography.

Many attempts have been made to define the term bibliometrics and its analogous terms. Hulme (1923) defined the term statistical bibliography, Raising (1962) defined bibliometrics more comprehensively, Prichard (1969) defined bibliometrics very pinpointedly. Fairthorne (1969) also defined it. The British Standard Glossary (1976) of documentation of terms explained the term bibliometrics, which is basically similar to Prichard's definition. Hawkins (1977) defined the terms bibliometrics Nicholas and Ritchie (1978) defined it and added that bibliometric studies fall mainly into two broad groups i.e. descriptive studies and behavioural studies. Recently Potter (1981) defined the term and he mentioned about the authorship pattern in his definition. Schrader (1981) defined it in very simple words. Brodus (1978) overviewed all these definitions and proposed an alternative definition. More explicitly Sengupta (1990) defines the term Bibliometrics.

Merton and Garfield (1963) have defined the analogous term 'Scientometrics' which is originated in Russia.

According to Sen (1988) Bibliometrics deals with documents and its components while metric studies pertaining to information is Informetrics. Morales (1985) used the term informetrics to cover almost all the aspects of Bibliometrics and Librametrics.

Study of Narin (1976) 'Evaluative Bibliometrics' is evaluative in nature and concerned with the development of different research applications of bibliometrics. Hjerppe compiled in (1980) & supplemented in (1982) the bibliography of Bibliometrics and citation
Indexing and Analysis contained total number of 2032 individual items which is the evident of library of bibliometric studies during 1980's.

An attempt was made by Linus Ikpaahindi (1985) to analyse the original articles that discussed the basic concepts of bibliometrics. Egghe (1988) analysed the methodological aspects of bibliometrics and in (1994) he analysed the quality of Bibliometrics, Informetrics and Scientometric research. On these same lines Schubert (1989) attempted to make a detailed compilation of bibliometric indicators. Arunachalam (1989) did the general study at the national level to review the Scientometric research in India.

In the course of its evaluation, Bibliometrics has a recognised potential for social utilisation and contribution to science. Barre (1994) has discussed this need to focus bibliometrics research towards concrete social requirements in his study.

Citation analysis is one of the important and quite old branch of bibliometric study. The citation analysis studies are based on citations appended to a publications. The primary function of citation is to provide a connection between two documents, one which cites and the other which is cited. The first recorded citation analysis was a study by P.L.K. Groos and E. M. Groos (1927)

Considerable amount of literature was available on citation analysis as early as in 1950. Stevens (1953) studied the citation data for six different subjects.

'The Bibliographical references : A Review of its role 'by Mitra A. C. (1970), 'Citation analysis' by John Martin (1975), 'Citation analysis and its application : A Review' by Guta B. M. and Nagpal P. K. (1976) and 'Citation analysis' by Linda C. Smith (1981) are some of the important reviews covering previous literature on citation analysis based studies.
Eugene Garfield has published a number of articles on citation analysis, discussing the potential of citation analysis as a research technique capable of predicting the direction of the development of a discipline might take in the future. The dependability of citation analysis as a research technique drew impassioned discussion from Garfield (1978), Broadus (1977), Griffith (1977), Parker (1977) and Linda C. Smith (1981) Race (1989) had reviewed the validity and reliability issues in citation research and concluded that citation analysis was a useful method for studying a wide range of topics in bibliometrics and the sociology of science.

2.3 Formwise Distribution of Citations


It can be summarised from above studies that formwise distribution deals with the form of documents cited by the research scholars in their research work. In general books seem to constitute the major form of literature used in social sciences on the other hand journals constitute the major form of literature used in pure and applied sciences.

2.4 Langagewise Distribution

Authors cite different types of document for writing articles. The selection of a specific type of document for reference depends on many factors like the subject matter, its year of publication, country of origin of its coverage, method of work, language and availability of the source material. In the free flow of knowledge, language plays as one of the barrier.

There are a lot of social science books in English language mainly because of the widespread use of English as the medium for study and teaching, especially at the higher levels of education. But the Government’s initiative to switch over to Marathi as the official language gave a fillip to the production of more books in the Marathi
language.


Present study reviews that research scholars prefer the English language for their research studies.

2.5 Authorship Pattern

Authorship studies mainly deal with kind of authors, nature and degree of collaboration among them. The authorship studies can be carried out both for citing and cited articles. The various kinds of authors appeared in publications are grouped as personal author works, corporate body and anonymous publications. Collaboration authorship study indicates how authors work together to bring out a publication.

In recent years with the advancement of science and technology maximum research work are being carried out on collaborative basis, at the same time maximum research works in social sciences are being carried out on personal level.

To understand the authorship pattern articles published by different authors in different journals of library and information science were taken for review. These articles are on different disciplines of sciences as well as social sciences. For this particular aspect twenty
four research articles have been reviewed.

In Social Sciences and languages mostly cited books are of single author which is in the range of 75 to (98%) and range of collaborative author is 2 to (25%). On the other hand in Sciences and Applied Sciences collaborative authorship is most dominant with 60% and of single author (40%).


disciplines of Sciences and Applied Sciences. It implies that the pattern of authorship varies from one subject field to another.

The study also indicates that single author contribution is maximum and team research is not popular among the researchers in social sciences but in pure science priority goes to collaborative authorship pattern.

2.6 Countrywise Distribution

It identifies and discusses the countries from where the documents are published. Literature in pure sciences merged from United States and Europe received its momentum from other lands also, in a short span of time. The rise of Scientific and Political Science and their growing developments were contributive factors in the acquisition of knowledge and the production of literature. As a result, there came into being a large number of generators and contributors of human information.

Review of the related literature about countrywise distribution of cited documents has been taken. For this twenty articles have reviewed to get an idea of geographical distribution.

Research articles by Kaushik Bose and Sunil Goiia (1995) in Library Science, Ushadevi S. P. (1997) in Agricultural Economics, Doraswamy S and Pulla Reddy V. (2001) in Subject Geography, Gupta B. M. and Kamlan Bindu (2002) in Knowledge Organisation, Chandrakumar V. (2003) in Sanskrit reviews that researchers prefer the Indian journals for their research work. Citations of Indian journals are within the range of 40 to (72%) and foreign journals within the range of 28 to 60%. Brief study by Parekh Harsha (1990) on all the subjects of social science indicates that research scholars in the subjects Political Science, Psychology, Linguistics and Library Science prefers foreign periodicals where as the researches of the subject Economics prefer Indian journals but Parekh and Seth found more U. S. journal citations than Indian. In
another study concluded that there were less than 1/2 citations per article to foreign periodicals among the foreign journals, American journal preponderate over all other countries, with British journals occupying a second place, India, USA and UK together account for about (90%) of the journals used.


2.7 Chronological Distribution

Comparing the findings of the different citation studies regarding the age of literature used was even more difficult because of number of reasons. The time spans used differed, the dates of the source documents themselves differed considerably and the way of reporting age differed.


In the subject Economics William Sheeja (2002) concluded that 75% of
the citations in the thesis belong to the First Previous Decade (FPD). Generally this conclusion is applicable to the discipline of Sciences and Applied Science also.

2.7.1 Obsolescence and Half Life Period of Literature

The concept of half-life has been borrowed from the field of nuclear physics to illustrate journal obsolescence. The citation half-life provides a quantitative measure of the rate at which scientific papers become obsolete.

Gross and Gross (1927) reported that the half life of the literature of different subject varies much Burton and Kebler (1960) reported the values of half-life in Chemical engineering is 4.8 years, Mechanical engineering is 5.2, Metallurgical engineering 3.9 Maths 10.5, Physics 4.6, Chemistry 8.1, Geology 11.8, Physiology 7.2 and Botany 10.2 years. The value of half-life for a given subject is not constant for all the times.


Maheshwarappa B. S. & Prakash B. P. (1982) had calculated the half life period of the subject Botany is 12 years. Parekh Harsha (1990) reported that in the social science discipline, Economics and Political Science seems to be using more recent publications than the other social science disciplines. History did not adhere to this pattern, Dutta Bidyarthi (2002) reported that obsolescence can be traced with the aid of journals but other communication
media like books, theses, conference proceedings etc always present some obsolete information.

2.8 Conclusion

Fourty five related studies reviewed in this chapter to present the trends in bibliometric studies. The review point out that the absence of a full length study in the field of social sciences at one place and in the study citation analysis of Doctoral theses.

This study also shows that lot of literature is available on bibliometrics, citation analysis. It is observed from the literature review that results of bibliometrics studies in the discipline of pure, applied sciences and social sciences are totally controversial.

From the studies of various authors it also observed that various subjects under social science have the uniform pattern about formwise distribution, languagewise distribution, countrywise distribution, chronological distribution, authorship pattern etc. Comparing the author rank, title rank and journal rank of different subjects is quite difficult due to subject differences.

Considering these factors bibliometric studies of different subjects of Social Sciences have been described in next chapters.