CHAPTER -I

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CHAPTER - I
INTRODUCTION

1.0 Introduction

Library is a social institution which brings a Reader into relationship with the Writer, the Publisher and of-course the Librarian. These relationships can also be viewed in terms of knowledge producers. Library is the heart of an Educational Intuition. Father of Indian library movement, Dr. S. R Ranganthan describes the constituting factors of a library as “Books, Readers and Staff as the Basic Trinity of the library”

The word ‘Library’ has its origin in the phrase Liber which means ‘Book’ in Latin and correspondingly in the Greek and other Roman languages the term is bibliotheca which means collection of books or group of books or other print materials. ‘Library’ may be defined as "a collection or group of books or collection of books or other print or non print materials, which is organized and maintained for use.” Here ‘use’ represents reading, consultation, study, research, learning and such several other utilizations. The library is a dynamic instrument of education. It is an agency for the transfer of knowledge and builds the bridge between Knowledge and the information users.

References and Citations are crucial in every kind of Research Writing and Reporting. These direct the readers to additional information pertaining to the concept or idea which has been presented and discussed. References also help the readers to evaluate and ascertain the authenticity and accuracy of the analysis, interpretation and conclusion. Citation Analysis is a component of Bibliometric and Scientometrics. Pritchard (1969) define Bibliometry means “the application of mathematics and statistical methods to books, articles and other means of communications”.

At ASLIB conference held in Lamington Spa in 1948, to develop ‘Librametry’ on the lines of Biometry, Econometry and Psychometry, besides, many of the issues connected with library work and services involved large numbers.
Garfield (1979) given citation study mainly aims at Journal Ranking, evaluating, judging, and assessing the scientific ‘quality’ of the Journals, of the Authors, and of the concerned Institutions. The primary and crucial purpose of Citation Analysis, however, is to track down the origins of ideas and concepts and their dissemination.

Citation Analysis is basically a process involving Assessment of method that offers one of the best ways to understand how the referring students could utilize the resources and locate the right information at the right time. It is also useful for evaluating the types of sources being utilized by the user community.

1.1 Citation

Citation or References are accompanied by a list of the entire Citations in alphabetical order, in the concluding section, normally referred to as ‘references’ ‘reference list’, ‘works cited’ or ‘end-text citations’ and other similar terms. The word reference is derived from Middle English referren, from Middle French référer, from Latin referre, ‘to carry back’ formed from a prefix re- and ferre, meaning ‘to bear’.

Citation is a reference given of a document in research writing such as Thesis, Research-articles, Project-reports, etc.

A reference can take on many forms, including: a thought, a sensory perception that is audible (onomatopoeia), visual (text), olfactory or tactile, relationship with other space-time coordinate, symbolic or alpha-numeric, a physical object or an energy projection; however, other concrete and abstract contexts do exist as methods of defining references within the scope of the various fields that require an Origin, Point of Departure, or an Original Form. This includes methods that intentionally hide the references from some observers, as in Cryptography.

Citation is special reference works that are used to identify as many published works on a given subject as possible, and serve as compilations for other authors or researchers.
References are found to be of many types. Generally, references are printed matter but may also come in an electronic or machine-readable form. Information on the Internet may be referred to by a Uniform Referral. Citation is a reference to a published and/or unpublished source (need not necessarily always be the original source). More precisely, a Citation can be said to be an abbreviated Alphanumeric Expression (e.g. embedded in the body of an intellectual work that denotes an entry in the Bibliographic References Section of the work for the purpose of acknowledging the relevance of the works of others to the topic of discussion at the spot where the citation appears. Generally the combination of both the in-body Citation and the Bibliographic entry constitute what is commonly thought of as a Citation (in-fact bibliographic entries by themselves are not Citation).

1.1.1 Origin of Citation

The origin of citation, foot-notes, references, bibliography and citation-practice cannot be precisely determined. The foot-notes mentioned at the bottom of the page have now attained a position of considerable importance. But the practice seems to have been well established in Scientific Writing even in the early periodicals started about three centuries ago. Now-a-day’s practiced as End of the Chapter References is quoted or at the end of the books it is added as ‘References’. Present-day researchers follow several formats of reference styles. Some of the very famous styles which are practiced are APA, Chicago manual, IEEE, MLA handbook and Turbine styles, etc.

The primary idea goes back to Derek de Solla Price (1963) he presented the growth of Scientific Literature in his book ‘Little Science, Big Science’. This book became a classic and he stated that- “the most obvious manifestation of this scholarly bricklaying of the citation or references. One cannot assume that all authors have been accurate, consistent, and conscientious in noting their sources. Some have done too little. Others too much, but it is generally evident from a long run of any scientific periodical that around 1850 there appears the familiar modern pattern of explicit reference to previous work on which rests the distinct. Well knit addition that is the ideal burden of each paper. Before that time, though footnoting is as old as scholarship itself, compared the term scholia for the ancient foot-note there is nothing
like this attitude toward the accretion of learning citation”. He is suggesting that science is not a unified whole subject, but a mosaic of specialty areas. This new understanding fostered an effort to map the intellectual structure of science. The techniques for this analysis were taken from bibliometrics. Although the practice of citation has a long history, yet the use of the Citations for other than their primary purpose seems to be of recent origin.

The tradition of providing Citations at the end of technical writing is an age old phenomenon (White 1985). They have their own origins in the referencing practices of researchers and writers. It is reported that the ‘concept of identification of the source of an idea or quotation’ developed during Renaissance, (i.e. from 14th to 16th Century A.D.) after the invention of Oxford English Dictionary. The William Savage’s A Dictionary of the Art of printing (1841) Containing 88 bottom notes or footnotes. It is mentioned that earlier examples of notes resembling footnotes are the Rheims-Douai version of the Bible (1763). In 20th century several changes occurred in the concept of bibliographic references and Citations. Thus Citations today are accepted as an integral part of scholarship. Ziman (1968) define Citation as “a scientific paper does not stand alone; it is embedded in the ‘literature’ of a subject”.

1.1.2 Meaning of Citation

Reference means a footnote in an article which gives bibliographic information about an earlier article (Krauze & Hillinger, 1971). Citation is reported to serve as label for intellectual property in all types of scholarly literature. Citation establishes relations among authors who are measure of the extent to which they communicate indirectly through the literature (Shaw, 1979). It has drawn the attention of most of the specialists in the field of library and information science. Citation acknowledges intellectual indebtedness. Martyn (1975) states, that, the primary function of these Citations is to provide a connection between two documents, one which cites and other which is cited. The Citation represents a relationship between cited document and Citations. A Citation scholar Garfield (1965) has identified some fifteen reasons as to why authors cite. These are:

1. Paying homage to pioneers.
2. Giving credit for related work (homage to Peers).
3. Identifying methodology, equipment, etc.
4. Providing background reading.
5. Correcting one’s own work.
6. Correcting the work of others.
7. Criticizing previous work.
8. Alerting forthcoming work.
9. Substantiating claims.
10. Providing leads to poorly disseminated, poorly indexed, or un-cited work.
11. Authenticating data and classes of fact- physical, constants etc.
12. Identifying the original publications in which an idea or concept was discussed.
13. Identifying original publications or other work describing a concept or term.,
14. Disclaiming work or ideas of others (negative claims).
15. Disputing priority claims of others (negative homage).

In Science research work is normally a new invention and that work itself is result oriented. Therefore, it is inferred that when an author cites he finds the cited item to be worth citing, the degree of relevance although may vary.

The word ‘reference’ means ‘the acknowledgement of one document given (in the form of document representation) to another’. Citation is the ‘acknowledgement one document receives from another’. So Citations are the most important element of citation analysis.

1.2 Citation Analysis

Citation Analysis is an established research tool for bibliometrics study and it by itself is also a sub-area of bibliometrics study. Its utilization is seen in several distinctly different ways in libraries. Citation Analysis has become one of the popular methods employed in the identification of core journals in a particular subject field or for a particular scientific community in a geographical area. It is a technique of listing of references cited to articles in significant periodicals and counting the frequency with which periodicals are cited. This method emphasizes that journals are the most
desirable ones in a library collection, for they are likely to be frequently used by the scientists.

Citation analyses provide a number of interesting and useful insights into the network of journals that function as the primary formal communication medium of science (Le Pair 1988). Garfield (1975) defined Citation Analysis “as a major method of bibliometrics that considers the Citations (both to and from documents)”. So the Citation studies may focus on documents and their authors, journals, (either as cited or citing source of publications, when documents are Journal Articles) and countries as the producer of those documents.

Early Citation studies were frequently based on list of references provided in articles appearing in a limited number of journals. In those studies, Citations had to be transcribed and manipulated by hand to get the results. Therefore it was difficult to hold huge amount of data for citation analysis. Moreover, because of the tediousness of the process, the scope of most study was limited in nature. The introduction of computer has significantly improved the situation. It is now possible to produce computer printed indexes, which contain citation data from thousands of documents, and also to get citation data in machine readable form. That’s why Citation Analysis is one of most attractive fields of study in bibliometrics where Citations play key function.

Garfield presented Citation Analysis has predominated and very useful technique for studying the trends in Scientific Research and describes it as an analytical tool which uses references Citations of a scientific paper. Citation Analysis uses bibliographic references and their count to identify what material is related to a particular topic and is worth reading. On another side it helps in studying how a scientist interacts with these colleagues.

Citations are also used successfully as reading lists and in preparation of bibliographies. The value of citation is well observed through Science Citation Index (SCI), Social Science Citation Index (SSCI), and Art & Humanities Citation Index (AHCI).
The term ‘Citation Analysis’ never appeared till 1956. Many of them attempted to Ranking the importance of Journals on the basic of an average number of references to Journals cited in research papers. The first user-study was based on a systematic citation count by Gross & Gross (1927) authors.

The development of Citation Analysis has been marked by the invention of new techniques and measures, the exploitation of new tools and the study of different units of analysis. These trends have led to a rapid growth in the number and types of studies using Citation analysis.

Problem of citation study is mentioned by Mahapatra (1991) ‘hello citations’, where authors intentionally cite to estimate such Citations while ranking the authors on the basis of their citations.

Critics of the Citation Analysis by Martyn (1976) as the amount of information cited may vary with the section of the paper in which the citation is made, with each reference cited to research writing not being relevant to the whole topic. A typical research paper was having an Introduction, Methodology, and Analysis. This introductory part is likely to refer to the whole of the Cited articles. Whereas the experimental section it makes use of bits of materials from the cited articles. This kind of disproportionate use and scattering is a limitation imposed upon the Citation analysis.

Linda Smith (1981) stated that “the easiest techniques to use in a citation count determining how many Citations have been received by a given document or set of citing documents”. So totally Citation Analysis study most essential for collection development of library and to identify the core journal.

1.3 Need for the study

The study of Citation Analysis is one of the best technique for analyze the different attributes of Resources. Today most of the libraries are facing problems in Journal subscription cost, shrinking library budget, lack of space for library holdings, etc., which have resulted in number of user studies, being studied. The limited
financial resources have caused a lot of problems to the librarian; so they are forced to look for an alternative system for collection development and provide quality document to the user community. That’s where Citation Analysis proves to be one of the most essential and needful Study.

Citation Analysis has two broad areas of applications. One of them is suitable for librarians where Citations are used to find out various features of literature use like type of documents, languages, age, country of origin, subject distribution, highly cited authors, Journals, citation rate, authorship pattern etc. and the other kind of study is useful to derive the research productivity in a field of study. The Citation Analysis has many reasons for serious study. Due to the high cost journal subscriptions have been stopped in India. Some of the University libraries stopped the print Journal subscription is very less Journals are subscribed because of shrinking budget allocations and lack of space for current holdings. Librarians try to ascertain the collection development policies which were make optimum use of money and space available while meeting the current and future needs of their library users.

The University wise and specific subject wise Citation Analysis studies are very less and three Universities disciplines namely Physics, Chemistry and Zoology Doctoral theses Citation Analysis studies are less in numbers.

This type of study were being helpful to Physics, Chemistry and Zoology researchers and University librarians for subject wise source identification and maintain the library collection development policy. The analysis of this research work carried out between the particular periods it is helpful to compare the research work carried out under various disciplines in the field of Physics, Chemistry and Zoology subjects. This study recalls the nature of information used by the researchers and enables the librarian to plan to provide better information services and better collection development.

This study is help to three Universities for resource sharing activity. It may be create consortia in between three Universities library. Hence it is needs to study.
1.4 Statement of the Problem

The statement of the problem is **Citation Analysis of Doctoral theses: A study of Doctoral Theses Submitted to Universities of Karnataka.**

1.4.1 Definition of the concept

For clarity, the meanings of the terms ‘Citation Analysis’, ‘Doctoral Theses’, and ‘Universities of Karnataka’ appearing in the title are being discussed hereunder:

1.4.1.1 Citation Analysis

Citation Analysis is an Analysis of Citations or bibliographical references that have been used by researcher or scholars. The prime purpose of a citation is intellectual honesty to attribute to other authors the ideas they have previously expressed, rather than give the appearance to the works readers that the work’s authors are the original wellspring of those ideas. Citation Analysis has helped to identify the quality of the information sources.

Citation Analysis is an analytical tool which uses references and Citations of a scientific paper. The Citation Analysis is probably a fair evaluation tool for those scientific sub fields whose journals are the formal channels of communications. Citation Analysis deals with such aspects as: who are the links among Citations i.e. who cites whom, which journal, is cited by which journal, what subject fields are more cited in the literature of a specific discipline. This Citations Analysis is very useful to conduct research and find out trends in subject, authorship pattern, sources, Ranking, obsolescence, and chronological distribution are studied. Citation Analysis is a flexible and well studied method in a University library environment.

1.4.1.2 Doctoral Theses

Ph.D refers to a doctoral degree. It is technically a Doctor of Philosophy degree but it is awarded by Universities in all disciplines. The Ph.D requires several years of study beyond the master’s degree and sometimes it goes up 8 years of study depend on the fields. **Doctor of Philosophy (Ph.D),** an abbreviation for the Latin is “Philosophiae doctor”. In non-Anglo-Saxon language (e.g. German and Scandinavian) usage is Doctor Philosophiae. It was originally a degree granted by a
University to a learned individual who has achieved the approval of his peers and who had demonstrated a long and productive career in the field of philosophy. The Doctoral Thesis or dissertations are by there is very nature meant to report some original work in a specific field. One important characteristic of such research report is it they may be the result of purely academic pursuit. The subject of thesis may not have any commercial application, yet it may be worth pursuing an idea, a process, a technique etc. The investigator studied the Doctoral thesis of Physics, Chemistry, and Zoology subjects submitted to three Universities of Karnataka during 2006 to 2010 years.

1.4.1.3 Universities of Karnataka

The Doctoral thesis submitted to Universities of Karnataka was studied. Karnataka has one of the most highly educated populations in India. The state has a large number of schools and educational institutions, nearly half of which are managed by the government; the remainders are operated by local boards and private bodies. Compulsory free primary education is provided in most towns and villages. Higher education system in Karnataka comprises degree colleges, technical and vocational colleges, universities, institutions, deemed to be Universities and institutions of higher education having national importance. There are different types of colleges such as government colleges, privately managed colleges, private-aided colleges, University colleges and professional colleges. Considerable progress has been made in Karnataka with the establishment there are twenty-four State Universities.

The investigator in his study has confined its scope to major research produced, well established and old general Universities of Karnataka. The present study covers three general Universities of Karnataka. They are:

1) University of Mysore, Mysuru (1916)
2) Karnataka University, Dharwad (1949) and
3) Bangalore University, Bangalore (1964).

The investigator studied Ph.D Theses pertaining to the three subjects, viz., Physics, Chemistry and Zoology, which were submitted to these three Universities, during the years 2006 to 2010 (both years included).
The researcher traced and collected 181 Ph.D Theses submitted to these three Universities of Karnataka particularly the subjects of Physics, Chemistry, and Zoology during the year 2006 to the end of year 2010. The total number of Citations analyzed for the study adds up to 22,752.

1.5 Objectives of the study

The main objectives of the study are Citation Analysis of Doctoral Theses: A study of Doctoral Theses Submitted to Universities of Karnataka. The specific objectives of the study are as follows:

1. To study the sources of literature used by the researchers of Physics, Chemistry and Zoology.
2. To ascertain the Authorship pattern of Citations
3. To ascertain the Chronological distribution of Citations
4. To analyze the subject wise Distribution of Citations
5. To identify the Language wise Distribution of Citations.
6. To study the Geographical Distribution of Citations.
7. To analyze publisher wise Distribution of Books and Journals Citations.
8. To compile the Ranking list of Physics, Chemistry and Zoology subjects
9. To verify the result with the Bradford’s law of scattering
10. To study the obsolescence of Journal and book Citations and evaluate their half life.

1.6 Hypotheses

Regarding the objectives of the study, the following hypotheses have been framed and analysed:

1) **Hypothesis -1**
The researchers of Physics, Chemistry and Zoology highly cited the periodical literature rather than other sources of information.

2) **Hypothesis -2**
The researchers are highly depending on Current literature.

3) **Hypothesis – 3**
The Majority of researchers are cited the resources published by the developed countries.
4) Hypothesis – 4
The researchers of Physics, Chemistry and Zoology highly cited the English language resources.

5) Hypothesis – 5
Majority of researchers are cited the multiple authorship pattern Citations.

6) Hypothesis – 6
The researchers cited the specific resources are highest from their subjects.

7) Hypothesis – 7
Majority of Cited Journal citations are published by the developed countries.

8) Hypothesis – 8
Majority of Cited Book sources are published by the developed countries.

9) Hypothesis -9
The Citations of Journal literature does conform to Bradford’s Law of scattering.

1.7 Methodology
The fundamental work is collecting the details of the published research papers were obtained referring to Library and Information science abstracts (LISA). The original articles were referred to have clear understanding of the various procedure followed by earlier researchers in the field of study.

The research study process to three levels the first level is identifying the data source, determining the data and procedure followed for analyzing the data.

a) Identifying the data source:
The base work is data identification that is Doctoral Theses submitted to three Universities of Karnataka of three subjects of Physics, Chemistry and Zoology during 2006 to 2010 period. The primary phase data identification is major work for the research. It involves different steps that are to collect the detail of submitted theses from three Universities Registrar of Evaluation section or Research section and Departments. The Researcher visited the each University evaluation section and research section for collect submitted theses and awarded list of three subjects during 2006 to 2010. University examination section or research section is maintaining the
submitted and awarded thesis records. Universities provide the list of the submitted thesis list. Other Universities provide annual report of each year. This annual reports cover awarded theses details. Then the researcher prepares the list of awarded and submitted theses of three subjects. Basis of the list researcher search the theses in University library, concerned department, Research Guide, and Department Library.

b) Data Collection

The study encompasses the three Universities of Karnataka and three subjects of Physics, Chemistry and Zoology theses. Basis on the details provided by the Universities Registrar evaluation sections, the researcher collected the copy of the relevant theses from the University library and the department libraries. If the thesis not in this section researcher consult the guides to collect the theses. Researcher found or traced altogether, 181 theses of three subjects and relevant part for the study especially the bibliography and reference parts were xeroxed for the detailed analytical study. This study studied the available 181 Ph.D theses of Physics, Chemistry and Zoology during 2006 to 2010 of three Universities of Karnataka.

c) Procedure

The bibliographical records of the theses submitted to the departments of Physics, Chemistry and Zoology in the three selected Universities namely, University of Mysore, Mysuru, Karnataka University, Dharwad, and Bangalore University, Bengaluru, were collected as the primary step. Further the copies of the theses were traced and the relevant parts for the study especially the bibliography and reference part were xeroxed for the detailed analytical study. Here, the study was restricted to the Citation Analysis of the doctoral theses submitted to the departments of Physics, Chemistry and Zoology in the three well established Universities in Karnataka. The doctoral theses submitted during the period 2006 to 2010 were covered. Al together 181 theses were traced and collected the data for the detailed analytical study. The detail thus obtained has lead to the study of year wise thesis submitted details, subject, Place of Publications , year of publications , bibliographic forms, chronological distribution, subject wise distribution, Language, author characteristics, citation age, publisher name, and other such document characteristics.
Then the researcher enters the data in MS Excel data sheet basis of pre defined fields. This also aimed some useful attributes that is Journal Ranking, journal and book obsolescence, citation age. The study account 22,752 covering the three basic science disciplines from the three universities.

The citation data thus obtained have been tabulated and interpreted to attire at the valid findings and conclusion.

**1.8 Scope and Limitations of the study**

The general Universities make a major contribution to overall education system and play a pivotal role in the social and economical development of the nation. Karnataka state is marching fast in higher education and University education system from before independence resulting in enormous growth in University establishment and provides higher education and research activities.

The scope of the study is restricted to the research work conducted, well established, old Universities and major Universities of Karnataka, they are University of Mysore, Mysore, Karnataka University, Dharwad, and Bangalore University, Bangalore. These Universities having comparatively long standing universities.

The researcher further limited to study the three science subjects Physics, Chemistry and Zoology, The reason for this subject selecting being that the research works in these subjects is well established in these three Universities of Karnataka and cover those doctoral theses that have been submitted during 2006 to 2010. The present study carried that available doctoral theses in University libraries and departments which taken up for detailed investigation.

**1.9 Chapter Scheme**

The final Thesis consists of the following five chapters:

**Chapter I: Introduction:**

The introductory chapter explains the Introduction Citation, Origin, Meaning and history of Citations, Citation Analysis, Need of the Study, Statement of Problem, Defining the Statement, Objective of the Study, Hypothesis, Methodology, Analysis,
Scope and Limitations. It also mentioned the Chapter Scheme and References are quoted.

Chapter II: Literature Review:

The second chapter briefly mentions the Literature Review of Citation, Citation Analysis of Physics, Chemistry and Zoology – their subject-oriented Study and Literature Review based on this Research’s Objective. The Citation Analysis of Theses of these subjects – i.e., Citation Analysis of Physics, Chemistry and Zoology subjects have been recorded with their Literature Reviews.

Chapter III: University Education System in Karnataka:

The third chapter is another most important chapter with it’s focus on University Education System in Karnataka, Universities of Karnataka and briefed the prestigious Universities of Karnataka, viz., the University of Mysore, Mysuru, Karnataka University -Dharwad, and Bangalore University, Bengaluru. The workings of the departments of Physics, Chemistry and Zoology of these Universities’ have been explained. In this chapter is also analyzed the Theses submitted in these three subjects’ during the years 2006 to 2010. The respective Theses and their Citations have been analyzed with relevant explanations.

Chapter IV: Analysis and Interpretation of the data:

The fourth chapter analyses Citations, it covers citation data sources and presents the analyzed information based on predetermined objectives. The analysis has used MS Excel for data-analysis and data-representation. The data-analysis has analyzed and presented Theses data, Average Citations, Bibliographical forms, Journal Authorship patterns, Book Authorship Patterns, Authorship Degree of collaboration, Chronological citation distribution of Journal and Books citations, Geographical Distribution, Language Distribution, Subject-wise distribution of Physics, Chemistry and Zoology Books and Journals, Publisher-wise distribution of Books and Journals. The Core Journals of respective fields of Physics, Chemistry, & Zoology have been identified. Their respective Obsolescence of Books and journals, citation age, half life of Books and journals have been analyzed with results having been determined.
Chapter V: Findings, Suggestions and Conclusion:

The fifth and final chapter records the summary of all the major findings with the subject-wise findings being determined subsequently. Finally the researcher’s recommendations and suggestions including the suggestions for further research have been mentioned and the conclusion recorded.

Bibliography, University wise theses title list are provided at the end.
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