

**A Citation Analysis of Doctoral Dissertations in Library  
and Information Science Accepted by the Universities in  
Western India**

**A Thesis Submitted to  
Tilak Maharashtra Vidyapeeth  
For the Degree of Vidyavachaspati (PhD)  
In  
Library and Information Science  
Faculty of Moral and Social Sciences  
Tilak Maharashtra Vidyapeeth, Pune**

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**August  
2012**

## **DECLARATION**

I hereby declare that the thesis entitled “**A Citation Analysis of Doctoral Dissertations in Library and Information Science Accepted by the Universities in Western India**” completed and written by me has not previously formed the basis for the award of any degree or other similar title upon me of this or any other university or examining body.

Place: Pune

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Date: 22 August 2012

Research Student

## **CERTIFICATE**

This is to certify that the thesis entitled “**A Citation Analysis of Doctoral Dissertations in Library and Information Science Accepted by the Universities in Western India**” which is being submitted herewith for the award of the Degree of Vidyavachaspati (PhD) in Library and Information Science, Faculty of Moral and Social Sciences Tilak Maharashtra Vidyapeeth, Pune is the result of original research work completed by Prashant Laxmanrao Phugnar under my supervision and guidance. To the best of my knowledge and belief the work incorporated in this thesis has not formed the basis for the award of any degree or similar title of this or any other university or examining body upon him.

Place: Pune

Date: 22 August 2012

Dr. N B Dahibhate

Research Guide

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## List of Abbreviations

| Abbreviations used | Full form of Abbreviations                                      |
|--------------------|---|
| AAF                | Annual Aging Factor   |
| ACA                | Author Co-citation Analysis                                     |
| ACRL               | Association of Collage and Research Libraries                   |
| ADIS               | Associateship in Documentation and Information Science          |
| AICTE              | All India Council for Technical Education                       |
| AID                | Associateship In Documentation                                  |
| AIU                | Association of Indian Universities                              |
| ALA                | American Library Association                                    |
| AP                 | Andhra Pradesh  |
| ASLIB              | Association of Special Libraries and Information Bureau         |
| BMLA               | Bulletin of the Medical Library Association                     |
| BSG                | British Standard Glossary                                       |
| CRL/ C&RL          | College and Research Libraries                                  |
| C2IF/ CCIF         | Cascading Citation Indexing Framework                           |
| CALIBER            | Convention on Automation of Libraries in Education and Research |
| CD-ROM             | Compact Disk Read Only Memory                                   |
| CLIS               | Courses in Library and Information Science                      |
| CSIR               | Council of Scientific and Industrial Research                   |
| CTRI               | Clinical Trials Registry India                                  |
| DELNET             | Developing Library Network                                      |
| DESIDOC            | Defence Scientific Information and Documentation Centre         |
| DL                 | Digital Library   |

|                |   |
|----------------|---|
| DLA            | Delhi Library Association   |
| D-Lib Magazine | The Magazine of Digital Library Research                          |
| DLIS           | Diploma in Library and Information Science                        |
| DOI            | Digital Object Identifier   |
| DRTC           | Documentation Research and Training Centre                        |
| e-Books        | Electronic Books  |
| e-Citations    | Electronic Citations  |
| e-Documents    | Electronic Documents  |
| Edu            | Education   |
| e-Journals     | Electronic Journals   |
| e-Learning     | Electronic Learning   |
| ERA            | Excellence in Research for Australia                              |
| e-Resources    | Electronic Resources  |
| GUJ            | Gujrat  |
| GS             | Google Scholar  |
| HCI            | Human Computer Interaction  |
| h-Index        | Hirsch Index  |
| HRD            | Human Research Development  |
| HRM            | Human Resource Management   |
| IASLIC         | Indian Association of Special Libraries and Information Centres   |
| IATLIS         | Indian Association of Teachers in Library and Information Science |
| ICSSR          | Indian Council of Social Science Research                         |
| ICT            | Information Communication Technology                              |
| IF             | Impact Factor   |
| IFLA           | International Federation of Library Associations                  |

|                     |   |
|---------------------|---|
| IGNOU               | Indira Gandhi National Open University  |
| IISc                | Indian Institute of Science   |
| IJILIS              | Indian Journal of Information, Library and Society  |
| IJISM               | International Journal of Information Science and Management   |
| ILA                 | Indian Library Association  |
| INSDOC<br>(NISCAIR) | Indian National Scientific Documentation Centre (National Institute of Science Communication And Information Resources) |
| IP                  | Intellectual Property   |
| IPR                 | Intellectual Property Rights  |
| IQS                 | Institute Químico de Sarriá   |
| IR                  | Institutional Repository  |
| IRS                 | Information Retrieval Services  |
| ISB                 | Information Seeking Behaviour   |
| ISI                 | Institute of Scientific Information   |
| ISIJIF              | Institute of Scientific Information, Journal Impact Factor  |
| ISU                 | Iowa State University   |
| IT                  | Information Technology  |
| JAL                 | Journal of Academic Librarianship   |
| JCR                 | Journal Citation Reports  |
| JFSC                | Journal of Fishery Sciences of China  |
| JOI                 | Journal of Infometrics  |
| JOR                 | Journal of Oilseed Research   |
| KM                  | Knowledge Management  |
| LIC                 | Library and Information Centres   |
| LIS                 | Library and Information Science   |
| LISA                | Library and Information Science Abstract  |

|             |   |
|-------------|---|
| LLBA        | Linguistics and Language Behaviour Abstracts                          |
| M Phil      | Master of Philosophy  |
| M&D         | Master's and Doctoral   |
| MALA        | Madras Library Association  |
| MLIS        | Master in Library and Information Science                             |
| MP          | Madhya Pradesh  |
| MS          | Maharashtra State   |
| NASSDOC     | National Social Science Documentation Centre                          |
| NEHU        | North East Hill University  |
| NIC         | National Informatics Centre   |
| NISCAIR     | National Institute of Science Communication And Information Resources |
| NISCOM      | National Institute of Science Communication                           |
| NML         | National Medical Library  |
| OA          | Open Access   |
| OCLC        | Online Computer Library Centre  |
| p-Citations | Print Citations   |
| PG          | Postgraduate  |
| PhD         | Doctor of Philosophy  |
| R&D         | Research and Development  |
| RMJ         | Rawal Medical Journal   |
| RTMU        | Rashtrasant Tukadoji Maharaj University                               |
| SCI         | Science Citation Index  |
| SET         | State Eligibility Test  |
| SLET        | State Level Eligibility Test (N. E. Region)                           |
| SLIS        | School of Library and Information Science                             |

|           |  |
|-----------|--|
| SSCI      | Social Sciences Citation Index                                   |
| STS       | Science, Technology and Society                                  |
| TN        | Tamil Nadu   |
| TRJ       | Textile Research Journal   |
| TTU       | Texas Tech University  |
| TUT       | Tshwane University of Technology                                 |
| UAI       | Universal Author Identifier                                      |
| UGC       | University Grants Commission                                     |
| UNESCO    | United Nations Educational, Scientific and Cultural Organization |
| UP        | Uttar Pradesh  |
| UPSC      | Union Public Service Commission                                  |
| URL       | Uniform Resource Locator   |
| VL        | Virtual Library  |
| WIF       | Web Impact Factor  |
| WoK/ WOK  | Web of Knowledge   |
| WoS / WOS | World of Science   |
| YCMOU     | Yashwantrao Chavan Maharashtra Open University                   |

## **Executive Summary**

The present research study deals with the critical analysis of research activity carried out in Department of Library and Information Science (DLIS), from different universities of western Indian part, covering three states viz. Maharashtra, Gujrat and Goa. A citation analysis study is performed using citations appeared in the dissertations accepted in universities of western India during the period 1980 to 2010 in Library and Information Science (LIS). The study covers analysis of 152 PhD theses for which degrees are awarded, and since only 124 theses were made physically available during the personal visit to these universities the data is collected from these theses. Thus in all 124 thesis having 16314 cited sources were collected and analysed by the researcher for conducting the study.

The present study is completed in seven chapters and chapter one narrates the background of LIS education and research, global and national development and importance of research and bibliometric studies, covering note on the historical and contemporary scenario of bibliometrics. The evaluation of bibliometric laws especially Bradford's Law of Scattering which has helped librarians and researchers and also made an attempt to use its applications in identifying core journals in LIS, research trends analysis etc. The research method, aim, objectives techniques used for conducting the study as well as limitations is also described in detail. Chapter two represents the review of the related and useful literature collected for the research study and this is very useful effort as the opinions of the different experts were incorporated in the study for justifying the analysed results of the research study. The literature review was conducted covering different useful themes to strengthen the base for the study like, general bibliometric studies, LIS education and research, Citation analysis studies in different LIS areas, and tracked author dispersion, form of dispersion, subject dispersion and geographical dispersion etc. The survey revealed the lack of information about quantitative LIS studies, on part of bibliometricians so as to conduct a thorough study. Thus it was also found that an urgent need of an in-depth quantitative analysis of the literature in LIS is justified. The quantification of LIS research output is prospective and useful for decision making. The application of quantitative methods would broaden the vision and sharpen research tools in order to

understand the field of LIS. It may also serve as a ready reckoner to the information specialists. In depth quantitative studies provided information to specialists about top ranking authors, publishers, subjects, countries, type of documents etc. This will have a considerable influence on the planning of research in LIS.

Chapter three covered the detailed study of the citations and citation analysis studies in which a detailed analysis is reported on citation, its use and importance, studies conducted in LIS using citations and citation methods, use of bibliometric laws etc. Chapter four is a detailed review of LIS education and research, a brief review of international status and detailed review of Indian education and research is highlighted. This chapter helped in recording the importance of LIS education and research. The trends in LIS education are highlighted and it was noticed that LIS education is reshaping continuously to suit the needs, where as the research element is still involved in traditional subject areas, but after 2005 a new dimension in research is being noticed and research activities are covering ICT based areas. Chapter five is elaborating the progress made in the selected areas i.e. western Indian universities, its LIS research contribution and analysis of the citations. The study is also compared with the Indian or national status and recorded the detailed activity in this part and reviewed LIS research activity. The research trend has also shown the similar trends reflected at international and national level except the speed of conducting research. Chapter six represents the detailed analysis of the data gathered and its presentation in suitable form to deduce the finding and suggestions. Chapter seven is summarised with the findings and suggestions and finally concluded the study with keeping further scope in research for the following researchers in the field.

The purpose of the research study is focused particularly to analyse and record trends in LIS research and education, by listing prominent research areas attempted so far in LIS research, noting the missing or gap in research areas as well as tracing the emerging areas in LIS research. The study is very useful to researchers and research guides as well as teaching professionals in setting the LIS curriculum and facilitating researchers to make aware of the missing areas in which research is to be carried out more. Similarly it is also useful for the research guides to tunes up with status and assign recent topics in which research is required to be carried out. The syllabus is also revised based on the trends and very useful for the curriculum development in LIS.

The study is also useful for the administrators in LIS i.e. Librarians and information professionals in selecting the publications, defining collection development policies and arranging the collection in libraries based on analysing ranking of LIS journals, calculating half life, type of documents used by researchers, finding core journals in LIS, authorship pattern, prominent authors, etc.



# Chapter 1-Introduction

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# **Chapter 1: Introduction**

## ***1.1 Introduction:***

Publishing the intellectual knowledge by human mind in print form has an immense value through which innovative results are communicated to the society by the researchers. Importance of reporting or publishing the knowledge by scholars is to establish monopoly rights or claims of ownership. Intellectual Property Rights (IPR) is playing an important role in protecting intellectual knowledge developed by researchers which is published in different forms and formats. Generally writing and communicating knowledge is contributed by individual contributors, researchers, R&D professionals, academicians, scholars, writers, communicators, editors, evaluators etc. and establish a novel contribution in their subject area continuously. Researchers communicate their result in different form depending upon the value and nature of information viz. general writing and compilation of work is published more in book form, first hand and nascent results in journal articles, novel research in patents, test methods in the form of standards, fine research results in the form of thesis, reviews in the form of reports, annuals, treatises etc. reference contributions in the form of encyclopaedias, fact finding books etc.

Thus main purpose behind publishing information or knowledge gained by human is to make aware others of the views expressed in a particular area or field or aspects in communicable form using previously published literature. The purpose behind publishing information may be of personal interest, or to protect Intellectual Property (IP) related issues but the published information is very useful to the R&D industries, scholars, information developers and thinkers etc. Similarly others can also read the publications and comment on the work contributed by someone and add knowledge to it by means of experience and experiments. Communicating the research results is base for the development of new concepts and new process. Publishing information is a fundamental activity which creates knowledge base. Barahona (2007), has pointed out that different publications have different goals and information which prefer the medium based on it like press release, industry forum, reports, websites, journals, conference proceedings, books etc. In information society, publishing knowledge is an integral part of research process and also considered as a metric for performance of research activity.

An essential part while publishing research papers in all sciences is that the use of literature made by authors for contributing knowledge are to be cited as a list of references indicating prior publications in similar area by the contributor while publishing the knowledge. Ziman (1968) opined that a scientific paper does not stand alone but always embedded in literature or subject. Nann (1976) defines the relation between reference and citations as “a reference is the acknowledgement that one document gives to another, and a citation is the acknowledgement that one document receives from another”. Citations are very useful for correlating different policies based on counting of citation popularly known as bibliometrics and study different relationship using citation patterns. Malin (1968) rightly suggested that a citation implies a relationship between a part or the whole of the cited document and a part or the whole of the citing document.

### ***1.2 Bibliometrics, Citation and Citation Analysis:-***

The term “bibliometrics” was first used by Pritchard in (1969) his article “Statistical Bibliography or Bibliometrics” published in the “Journal of Documentation”. “Biblio” means book and “Metric” means a scale or measure. Bibliometric means application of statistical studies in library and information science. According to Pritchard (1969), bibliometrics is defined as “the application of mathematics and statistical methods to books and other media of communication.” Potter (1981) defines bibliometrics as “the study and measurement of the publication pattern of all forms of written communication and their author”. Later De Sola Price (1970) is of the opinion that equating quality with citations is only one part of the problem. Most bibliometrics scholars would concur that citations reflect the communication behaviour of scholars in a particular field, and may have limited utility when compared to similar data from other fields. Derek de Solla Price (1970), pioneered the research into disciplinary differences in scholarly communication finding that scholars in the hard sciences are likely to give more citations in their papers and these citations are more recently published works. The study concluded indicating that the time lag between publication and citation was shorter in the hard sciences than it is in other disciplines. He further stated that citations represent a measure of utility rather than of quality.

Applications of citation analysis used by Garfield (1972), and he is also known as father of citation analysis studies, who has conducted enormous studies and published views based on analytical studies and out of his hundreds of studies which covers almost every branch of the natural and social sciences, indicated the better use of citation studies. Based on citation

analysis he developed Science Citation Index and Social Science Citation Index. The journal impact measure became popular and widely spread among the scientific community as journal impact factor. Journal impact factor is calculated based on citation counts and nowadays, it is linked to prestige or quality of journals in scientific area. Impact factors are not only used to rank journals, but also to evaluate individual scholars and research groups or department performance according to the journals they select for publication. Garfield pointed out importance of citation, co-citation, self citation and citation analysis studies in measuring performance. Since then citation analysis studies become more valuable. Garfield (1983) noted that citation analysis is used to study the journals as well as the people and work of science. Citation analyses of different subjects are based on a literary model of scientific process. He has observed that scientific work is represented by the papers published to report it, and the relationships between works are represented by references Garfield (2004).

Citation refers to the list of references to other works in a published work. "Referring" means mentioning in the proper context and giving an explicit bibliographical statement in a list of references. An older article is then cited by or receives citations from the newer one (Rousseau, 2008). Citations acknowledge the existence of related literature (Coleman, 2004). Those help in communicating specialist knowledge (Leydesdorff, 1998). Merton (2000) observed that citations provide peer recognition that is central to a scholarly system of science and other fields. Typically, citation shows a relationship exists between the work of an author and the previous works done in that field. Isaac Newton as stated by Merton (1968) referred to this relationship and said that "If I have seen further, it is by standing on the shoulders of giants". Authors contribute to existing knowledge and demonstrate that they are current with activity in their field (Aina, 2006). A citation is a bibliographical entry in a footnote, reference list or bibliography of a document that contains enough information to verify the original item (Leiding, 2005). According to Hovde (2000), citation checking of research documents and comparison of those citations with the availability of materials in a local collection offers unobtrusive and cost-effective method of evaluating that collection's ability to support research. Several studies have used citation analysis within a discipline for checking subscriptions or budget planning, policy making, reorganizing libraries etc. (Leiding, 2005; Haycock, 2004, Edwards, 1999, Sylvia, 1998; Devin & Kellogg, 1990).

Changing trends in research areas and information seeking behaviour of users are factors that libraries need to study in order to provide collections and services that fulfil the information needs of their clients. One such method to examine actual use of library collection may be in

the analysis of citations or references listed at the end of a research publication. Citation analysis looks at citation practices (Leydesdorff, 1998). Citation analysis helps in determining the competitive position of authors and can help to identify useful journals (Aina, 2006). Citation analysis may be viewed as a collaborative effort that can promote the quality of scholarly research (Rousseau, 2008). Citation analysis is also a way to understand users. Studying references cited by faculty publications shows the sources most commonly used and valued locally (Curtis, 2005).

Meho (2007) has observed that citation analysis is actually a branch of information science in which researchers study the way articles in a scholarly field are accessed and referenced. Citation analysis is used to identify core articles, authors, or journals in a field. Citation analysis has been used beyond information science for scholarly analysis and evaluation. Johnson (2000) points out that citation studies reveal much about scholarly communication and can guide collection development in academic libraries. Based on this model, citation analysis has been carried out in a variety of ways (Johnson, 1996).

Smith (1981) suggests that citation analysis of theses and dissertations can have implications for both collection development and user services. She cautions librarians that citation does not imply quality or importance. It is a controversial methodology because it does not represent all the possible needs or uses for information (Haycock, 2004). Though valid criticism of citation analysis exists, several authors have shown that citations correlate with other methods of collection analysis, including impact factors, circulation statistics, in-house use, and user surveys (Tsay 1998, Blečić, 1999 and Fuchs et al., 2006).

Governments, funding agencies, and tenure and promotion committees may use citation to evaluate the quality of work (Meho, 2007). Citation measures have emerged from studies of citation databases. These include journal Impact Factor and Relative Impact Factor. Meho (2007) also observes the growing number of web citation tools, including download counts, link analysis, and page ranking, as well as web citations, and Hirsch's "h-index" are popularly used. Not everyone agrees that citation analysis is the best way to judge validity of scientific claims (Meho, 2007). The applicability of Institute of Scientific Information (ISI) citation databases outside the natural sciences has been questioned, because these databases contain few books, proceedings, or other kinds of documents (Russell and Rousseau, 2002).

Meho (2000), in his case study pointed out that citation analysis is an important activity to measure the progress of activities carried out in a particular branch of knowledge. Citation

analysis involves counting, number of times a paper has been cited or researcher has referred to it. This helps in finding out influential researcher and works which are cited more often and becomes more popular in the discipline. Citation analysis also helps in finding out the impact factor of the Journals.

From above contributions it is very clear that citation study is very valuable for measuring utility and based on that concluding the activity. In library and information science citation and citation analysis has received importance and value because the basic idea behind citation study measure is to assess the impact, importance or quality of research work and to find out which resources have been used for conducting the research study, to analyze the scholarly work etc. Based on citations count, impact factor of the journals is calculated and this is very useful for selecting and subscribing to the journals for a library and also assist researcher to find proper way for publishing their research work for qualitative publications. Citation analysis is also considered as a best tool for collection development for libraries in the information explosion era. If a document is cited many times it is assumed that the subject discussed in the article is important, innovative in its discipline. Thus the list of articles and its published sources helps in findings information about research topic and this process is called "Citation Chasing". Citation study has also received importance while assessing the literature ranking and tracking the historical development of the topic.

Today, bibliometrics and scientometrics make extensive use of citations to assess quality and trace patterns of scholarly communication (Borgman and Furner, 2002; Wouters, 1989). A number of researchers have used citation analysis to look at the subject focus of postgraduate students and determine their journal needs (McCain and Bobick, 1981; Momoh 1996). Bibliometrics is a method used to study or measure the importance or value of literature and information published. Citation analysis and content analysis are commonly used as bibliometric methods in the field of Library and Information Science. This method is generally used to find out the impact of literature by examinations frequency or pattern of citations from published literature like periodical articles, books, journals, thesis, reports, conference proceedings and other published literature. Citation analysis reviews citations from scholarly work to connect links to other research work or other researchers. Citation analysis involves an analysis of referred literature while contributors to scholarly documents. Using citation analysis it is possible to find out the importance of scholarly work published. Analysis of statistical data related to scholarly (scientific) work helps in identifying subject scatters, pattern of authorship, citation trends as well as research trends in any discipline. This

practice was used since past many years and Ranganathan (1959) called it as 'Librametrics' where as Pritchard (1969) called it as bibliometrics, meaning the study of citations analysis while highlighting use pattern of literature. Other bibliometrics applications include: creating thesauri; measuring term frequencies; exploring grammatical and syntactical structures of texts; measuring usage by readers etc.

Presently bibliometrics have gained valuable place and used to deal with quantification of written communication like book and other media. Using this technique subject scatter, authorship pattern, citation trends and distribution pattern of information have been analyzed using bibliometric laws for developing policy management in libraries (e.g. collection development, book selection policy, maintenance policy, journal subscription etc).

In Library and Information Centres (LIC), citation analysis study has received prominent place as it is helpful for developing policies like stack maintenance based on half life, selection of journals and its subscription, collection development policies, weeding and de-selection policies, library collection organization, resource sharing policies, retro conversion policies etc. Thus citation analysis is very beneficial not only for researchers but also for analysis of collection, defying procurement policies. Similarly this method is also useful in assessing the research output in a particular area.

Citation analysis provides information on the use of references or literature in journals, thesis and others materials. In analyzing the citations, the frequency of the journal title, type and age of the resources used, place of publication, language and frequency of the author is analyzed to study use trends, which suggests means to enhance the library collection. It helps to point out the way to revise the collection and the services to allow the librarians to better serve the needs of the library users from the present to the future. Furthermore, it is also a technique that gives potentially valuable information in the management of library journal collection (Sapiah, 1997). Citation analysis helps identify the quality of the information sources. The more the information is cited, the higher the impact factor on the measure of citation count. This implies that more people use the information and the reliability of the cited information becomes higher. It is therefore pertinent that an analysis of the resources used by researchers be continually reviewed so that it can assist the library to build the collection and at the same time help researchers know the trend of their information resources use.

Citation analysis has received wide publicity and Web has also taken a note of it and they have also developed tools for citations for literature published over the web like Scopus, Web

of Science, Google scholar which have used the citation patterns for academic papers. The initial work of citation analysis was introduced by Eugen Garfield, Institute of Scientific Information (ISI). Thomson Scientific UK, developed Web of science and also lead to several new citation methods i.e. download counts, link analysis, Google page ranks, Web citations and h-index (Jorge Harsh) etc. Citation analysis is a very essential technique to measure the quality of source of material.

Thus it is concluded that citation analysis is useful for understanding subject relationships, author effectiveness, publication trends, and so on. The first recorded citation analysis was Gross and Gross (1927) who looked at citation patterns to determine the journals to be subscribed to and back volumes to be acquired for the library. Using citation analysis one can evaluate and interpret citations received by articles, authors, institutions, and other indications of scientific activity. Citation analysis is also a way to understand users. Studying references cited by faculty's publications shows the types of sources most commonly used and valued in their disciplines. It makes use of bibliographic references, which is an essential part of scientific communication. Citation analysis is a major area of bibliometric research, which uses various methods of citation analysis to establish relationships between authors or their work.

### ***1.3 Progress of research in LIS:-***

The review of LIS research is presented in two levels global and national.

#### ***1.3.1 Global Status of LIS Research:-***

Rochester and Vakkari (2003) conducted various national studies of different countries to analyse the trends in LIS research at global scenario and record the research trends in LIS research at global level based on the analysis. The different national studies in research were conducted by these two authors as an assignment of IFLA project during 1997-1998 and compared national and international trends in LIS research and recorded the development in research. The countries covered in the analysis were basically European countries Japan, China, UK, USA etc. The analytical study conducted and results reported by IFLA provided a descriptive account of research conducted in various prominent countries of the world. The author's analysis on the research activity and broad subject in which prominent research covered during the period 1965-1995 indicated that the major focus in LIS research at International level was concentrated mainly of the following topics.



1. Information storage and retrieval (87)
2. Library and information services (77)
3. Information seeking behavior (8)
4. Other LIS topics (25)

Thus out of 197 research studies it was reflected that ISR, LIS services and ISB were in prominent areas. Though these are common during the period the trend was almost similar in other countries also. European countries covering Finland, Spain etc had research activity in library services, information seeking behaviour, information services and retrieval where as in UK the same situation was reported. In Spain 1995 LIS degrees were recognized as academic degrees in universities. Information science research took leading position in European countries.

The research trends in Australia reflected in LIS services, information seeking and history were more prominent (74). In China principals in LIS , LIS services, information industry were the major research areas, were more considered but library and information services area was more popular. The most popular sub topics on which research was conducted more during 1965-1995 in China were:

1. Classification
2. Automation
3. Collection development
4. Information retrieval
5. Library management and administration
6. Library use

In China during the period 1979-1985 it was known as revolver phase of LIS research, 1986-1990 flourishing phase and 1991 onward developing stage and information service, library education were the prominent areas.

A comparative study conducted Vakkari (1996) for LIS research in Scandinavia countries like Denmark, Finland, Sweden, Norway; Spain etc. also reflected European trends in LIS research. Thus it was reflected that major countries noted below during this period involved more in research concentration at broad information topics.

- Denmark 47
- Finland 44
- International 40

- Spain 38
- Sweden 33
- Norway 26
- Turkey 21
- Australia 16

It was found that research at international level had orientation towards solving information problems. In LIS many authors reviewed the research methods used by LIS scholars for conducting effective research and noticed that among the different methods in which descriptive research covering survey (66), historical conceptual research element (79) as well as discussions, mathematical methods, literature review were the prominent methods.

In UK, LIS research was examined by Layzell Ward (1998) and pointed out the research trends and informed that research output was low initially and increased later after establishment of library association which setup research committee 1946 and from 1960 Government funding made available for LIS research. Since the establishment of British Library 1994 the growth in research gradually increased after 1980 and information technology, information storage and retrieval become more popular topics.

From the above global study it is noticed that LIS research progress was slow and different topics were grouped in to three areas based in traditional practices and since 1990 area were shifted towards modernization covering :

1. Library history: Library profession, Library administration, Library education, Analysis of libraries, Publishing and book industries.
2. Library and information services: Circulation, Collection development, Information and seeking behavior, User education
3. Information storage and retrieval: Cataloguing, classification and indexing, Information retrieval, Bibliographic databases
4. Information seeking behavior: Methods of information dissemination, Information sources, Information seeking behavior in different subject, Information use, Information management
5. Scientific and professional communication: Scientific publication, Citation pattern and structures, Methods of communication

### ***1.3.2 National Status of LIS Research (India):-***

Research in Library and Information Science (LIS) is proliferating due to many reasons and one of the prime reason is resource sharing. Research has gained value in all the subject disciplines including in LIS. Many research workers feel that there is a need to conduct research in LIS. No doubt that, developed countries conducted different research studies but developing countries are also improving and conducting research. Research in LIS is emerging since past few years, and more than 70 Indian universities have initiated research programs in LIS. The trend of research output is increasing. Out of 279 universities in India (Association of Indian Universities (AIU) Handbook 2010) about 70 (25%) universities impart to PhD research program in LIS. From 70 universities around 623 PhD theses awarded degrees during 1957-2009. This reflects the growth of research in Indian universities (AIU Handbook 2010).

AIU (Handbook 2009) and Rana (2011), listed the most productive universities in conducting research in the area of LIS and found that Karnataka University Dharwad, Andhra University Vishakhapatnam, Panjab University Chandigarh, Jiwaji University Gwalior, Osmania University Hyderabad and University of Rajasthan Jaipur are represented with more than 20 PhD's so far. Another 5 Universities listed out viz. university of Delhi, University of Bardawan, Vikram University of Ujjain, Gulbarga University of Karnataka and Madras University of Chennai are at leading position.

The data analysis of PhD degrees reported by Rana (2011) for the degrees awarded by different universities located in the states of India pointed out that from 1957-2009, 627 degrees were awarded. The theses submitted to the different universities in India were about 627 out of which she has covered most productive universities on the basis of Number of PhD degrees awarded. She has also covered more than 20 universities awarding 10-15 degrees by the universities covered in western zone. In spite of the higher number of PhD degrees are awarded in western zone universities but these are not listed in her list like Nagpur University 32 degrees awarded, BAMU (16), University of Pune (47) western zone etc. these are unwittingly left out from her list. This indicates that the Indian universities in the western zone have also contributed heavily in LIS research, but no where its statistics was reflected properly.

Detailed analysis of the theses published it was notice that in 1957, D.B. Krishna Rao became the first scholar to receive the doctoral degree in library science and his research theme was "Facet Analysis and Depth Classification of Agriculture". The second and the third PhD

degrees were awarded in 1963 and 1966, respectively, only three PhD degrees awarded in LIS in India during 1957-1970 (13 years) but during 1970-1980, 17 PhD degrees were awarded. The following table (1.1) indicates progress of PhD degrees in India since 1957.

| <b>Duration</b> | <b>Number</b> | <b>%</b> | <b>Remark</b>             |
|-----------------|---------------|----------|---------------------------|
| 1957-1980       | 20 (3+17)     | 3.2 %    | Slow growth period        |
| 1981-1990       | 104           | 16.7 %   | Steady growth period      |
| 1991-2000       | 232           | 37.3 %   | Rapid growth period       |
| 2001-2009       | 266           | 42.8 %   | Spectacular growth period |
| 1957-2009       | 622           | 100 %    |                           |

*Table 1.1: LIS Research output (1957-2009)*

*Source: - Rana (2011)*

Rana has pointed out that in 1950 Mr. Minendranath Basu was awarded the PhD degree by Kolkata University but no where it reported. From the above table it is notice that spectacular growth of research was reported during the period 2001-2009. It is concluded that due to new emerging areas and need of PhD in the LIS profession, there is an increasing trend in LIS research. Another reason might be, new universities have been added in the cluster of conducting LIS research programs. Rana (2011) cursory reviewed the LIS research subject areas in which more PhD degrees were awarded and these are reported under:

1. Library use and user studies.
2. University library, Public libraries, Information resources centers, Personals, Bibliometrics, information technologies, library networks, automation, reference and information sources etc.

He further stated that out of 62 PhD theses Information Technology (IT), automation, library networks accounts for 57 (25+20+12 respectively) thesis, i.e. 9%, and the rest are still working in the traditional zone but their contribution is also much important. The paper also revealed the low focussed areas in the field. During 2001-2009 the growth is expansive and overall increase is 42.8%.

On the review of literature it is also reflected that few studies have been conducted by the researchers in different zones of India and analyzed the research output in the area of LIS and studied trends in citing references by the researchers. The following eight research studies have been reported in literature review, wherein citation and citation analysis is being used for the research purpose as a technique.

1. Sangam S L (1986) Citation analysis of doctoral dissertations in social science accepted by Karnataka university during 1964-1982 from Gulbarga.
2. Kannappanavar B U (1991), Citation analysis of doctoral dissertations in library and information science accepted by the University of Karnataka from Karnataka.
3. Mapatra G (1993), Citation pattern among the Indian library and information science in English from 1975-1985 from Utkal.
4. Misra R (1997), Citation analysis of doctoral dissertations in library and information science accepted by the universities of Orissa and Manipur till 1993: A comparative study from Sambhalpur.
5. Thoidingian P D (1997), Citation analysis of the Ph. D. thesis in social science accepted by Guwahati University during 1970-1980 from Manipur.
6. Arvind N (1997), The literature of Physical Anthropology : A citation Analysis. Accepted by Padmavati Mahila University
7. Abbas Khan (1999), Citation analysis of the doctoral dissertations submitted to the Shivaji University Kolhapur in pure sciences (1962-1992) from Shivaji University, Kolhapur.
8. Deshmukh Prashant P (1998), citation analysis of Ph. D thesis submitted to Panjabrao krishi vidyapeeth during 1990-1994) from Amravati university, Amravati.

Few studies are also reported in the area of bibliometrics, scientometrics but use of citation is prominent tool.

#### ***1.4 Status of LIS Research in Western Indian Universities:***

Western India covers three prominent states viz. Maharashtra, Gujrat and Goa. These three states have 36 universities in all including agriculture and non-agriculture universities. Out of those 36 universities 21 (MS=11, GUJ=09, Goa=01) are non-agriculture, 06 agriculture (MS=5, GUJ=01, Goa 00) and 09(MS=8, GUJ=01, Goa=00) are other universities like Deccan College, Central Fisheries etc. In this study universities conducting research programs in LIS are considered. The remaining is eliminated as there is no LIS education and research activity reported. Thus for this study total 21 universities are considered but on review it is noticed that there is only Bachelors and Masters Degree Courses in LIS at Goa University and no research programs are being conducted in this university. Hence in all 20 universities where LIS research programs are being conducted.

Among 20 universities total 152 theses are submitted and awarded till 2010 among two states viz. Maharashtra and Gujrat. In Maharashtra from 11 universities, 136 PhD degrees were awarded and in Gujrat from 09 universities only 16 degrees were awarded. The period covered for this study is from 2010 during which the degrees awarded by the respective universities. The data collected for this study is by means of visiting each university and physically checking and getting the citations reported by researchers in their thesis. Similarly discussions with the LIS department heads were very useful for getting data related to degrees awarded, ongoing research, number of registered guides etc. It is analyzed that 16313 citations are being reported in 124 theses and on an average 131 citations are in each thesis. From the above review it is also found that few studies in western Indian universities are conducted in LIS area in which bibliometrics, citation analysis are being used. These are:

- 1) Khokale, R R (2005) Bibliometric analysis of PhD thesis awarded by Amravati University, Amravati: A study of information flow in some selective disciplines.
- 2) Abbas Khan, A A. (1999) Citation analysis of the doctoral dissertations submitted to the Shivaji University, Kolhapur in Pure science (1962-1992).
- 3) Deshmukh, P P(1998) Citation Analysis of PhD Thesis submitted to Panjabrao Krishi Vidyapeeth during 1990-1994.
- 4) Gawande, N N (2007) Literature use pattern in doctoral research at North Maharashtra University, Jalgaon: A bibliometric study during 1995-2000).

- 5) Dalve (Patil) D B (2004) Literature use pattern by the researchers in social sciences: A bibliometric analysis of doctoral thesis submitted to Dr Babasaheb Ambedkar Marathwada University, Aurangabad.

### ***1.5 Reason to select the Research Topic:-***

In the area of LIS initially education and now research is gaining momentum. In most of the universities research activities are flourishing. Considerable research awareness is reported since 2000 onwards. It is now felt necessary to access the trends in LIS research and progress made in LIS area. This might give a clue for gap in research areas for conducting prominent research. Researchers have to consult the literature for tracking the past events in the field and cite the relevant literature used for research. The trends in using citations might give the use of literature by researchers. Such studies are necessary to analyze and support to research activities by providing proper information support.

From the literature survey it was reported that citation analysis studies were conducted in different areas using bibliometric methods. There are in all Thirty Three research studies during the period 1983 to 1999 are reported in different universities of India wherein citation and bibliometric techniques were applied to analyze the research output in different areas (Appendix 1). But only eight studies are conducted using purely citation analysis technique.

Counting citations from scholarly research helps in measuring the importance of publications cited by scholars and based on these tracking the path of research in a particular discipline is treated as an important achievement to show the importance of areas and use pattern of literature by researchers. There is a need to undertake citation analysis study in the area of library and information science to find out the emerging trends in subject, research areas in the field, forms and formats of publications used by the scholars in completing their research, finding popular resources used by researchers, area of interest, emerging areas as well as gaps in research. Such studies may be useful to future researcher in the discipline. Library and information science is treated as an important discipline which support to various activities based on the collection and services. In Indian universities, research is treated as an essential qualification for the librarianship especially in academic library structure. The global scenario is much advanced and research element is embedded in the developed countries and the situation in the developing countries has also shown rise in LIS research area. Growth of research in Library and Information Science is increasing and there is a need to track the

disciplines already covered by the scholars and the emerging areas or missing areas in research where research is needed. This helps researchers in developing future library profession.

It is therefore decided to evaluate research conducted in different universities covered in Western part of India based on citations, subject area covered, literature used etc. Hence “A Citation Analysis of Doctoral Dissertations in Library and Information Science accepted by the Universities in Western India” is selected for research study.

This study might be useful for the future researcher for deciding the research topics to match the trends and policy makers of the libraries and the one where the more research is required to be undertaken. Considering these facts it was decided to conduct the research study of citations cited by researchers in LIS from 36 universities covered under western zone of India (non agriculture 21 universities selected where research element is introduced and PhD degrees are reported).

### ***1.6 Statement of the Problem:-***

The present study is an attempt to analyse bibliometric citations which have been cited by researchers in LIS work. While comparing doctoral dissertation from universities from western part of India since 1980 till 2010 to find out the trends using citation analysis method. The citations covered in the bibliography or footnotes are cover which contains all forms and literature used by researcher. The present study is entitled “A Citation Analysis of Doctoral Dissertations in Library and Information Science accepted by the Universities in Western India”. The main aim and objective of study is to map the trends in research and literature used pattern in the area of LIS. This study is helpful to the LIS research scholars in tracking the prevailing trends of research in LIS and its growth.

### ***1.7 Aim of the Study:-***

The aim of research study is to focused on two aspects

1. To track the research activities conducted in universities of western zone of India in LIS and assess the trends.



2. To analyze the bibliographic citations which have been cited in doctoral dissertations by the research scholars from library and information science in different universities located in western part of India.

### ***1.8 Objectives:-***

1. To study the significance of citations as well as citation study and bibliometrics
2. To study use of different information sources consulted and cited by the LIS scholars while conducting research study.
3. To study the research areas / topics covered by researchers in western Indian university and find the trends in LIS research.
4. To identify most cited sources, age of cited items, frequently cited journals and ranking, use of non-LIS resources, and identify half life of periodicals.
5. To study research growth and trends in LIS and compare it with the current developments in LIS.
6. To find out prominent research areas and the gap in research in LIS.

### ***1.9 Hypothesis:-***

1. There is a paucity of research on the emerging trends in LIS.
2. Available Information Communication Technology (ICT) facilities are hardly explored by the researchers to substantiate their coverage and productive output.
3. PhD students prefer periodical literature more as a source of information than other sources and now using web resources also in study.

### ***1.10 Research Methodology:-***

The research method used to undertake the study is descriptive research method. Two major sources for data collection used were, theses submitted for the Doctor of Philosophy (PhD) degree in the Department of LIS from universities located in western states of India. The population under study was, the total population of theses for which the degrees were awarded. In all, 152 theses have been awarded the degrees and out of these 124 theses were available at the time of visit and hence the population was 124 doctoral theses which were

analyzed thoroughly. Citations from the thesis reported by researchers were collected and analysed.

The references from each thesis were checked and collected and a total of 16313 citations were compiled from 124 theses. The references found in those theses were compiled according to the following characteristics: (a) year of publication; (b) name of researcher or author; (c) source title; (d) bibliographic format; (e) language; (f) subject category; and (g) place of publication. The subject category is decided on the basis of title and objectives of the theses defined by the scholar.

The present study is also based on analytical methods, analytical nature of study is due to analysis of citations used in completion of doctoral dissertation studies in various angles and pattern like author, form usages, chronological, geographical etc. The data analysis was completed with the help of excel sheet (instead of card preparation). The information from citations have been collected and organized in an excel sheet using different fields, like type of documents, source, year, publication etc. In brief citation analysis method is more suitable and valid for conducting this research. In addition to this, technique like secondary analysis is also used.

### ***1.11 Sample Selection (Population):-***

Out of 36 universities (Appendix 2) in western Indian Zone from three states viz. Maharashtra, Gujrat and Goa, and 21 non agricultural universities (Appendix 3) covered under the survey where researcher physically visited and reviewed the research work carried out in department of LIS. (MS=11, GUJ=09, Goa=01). Thus while conducting the present study only those universities are considered where research activity in LIS is practiced. Out of 36 universities from western India only 21 universities participate in LIS education. But according to a survey it is noticed that only 14 universities (as detailed in table 1.2) are conducting research programme in LIS (PhD). The remaining are only conducting education up to post graduate level i.e. MLISc. 152 PhD degrees have been awarded by these 14 universities right from its inception (1980) till 2010. Out of 152 theses (MS from 11 universities, 136 degrees were awarded and in Gujrat from 09 universities only 16 degrees were awarded), only 124 theses could be physically evaluated (28 theses were not made available for physical analysis). Hence the study is restricted to 124 theses from 14

universities. The data collected by visiting each university and physically checking and getting the citations from theses by researchers accounted 16313

| <b>Sr. No.</b> | <b>State</b> | <b>University</b>  | <b>Degrees Awarded (2010)</b> |
|----------------|--------------|--|-------------------------------|
| 1              | MS           | Amravati University, Amravati                            | 11                            |
| 2              | MS           | University of Mumbai, Mumbai                             | 02                            |
| 3              | MS           | Nagpur University, Nagpur                                | 32                            |
| 4              | MS           | University of Pune, Pune                                 | 57                            |
| 5              | MS           | Shivaji University, Kolhapur                             | 05                            |
| 6              | MS           | SNDT Women's University, Mumbai                          | 08                            |
| 7              | MS           | Yashwantrao Chavan Maharashtra Open University, Nashik   | 02                            |
| 8              | MS           | Swami Ramanand Teerth Marathwada University, Nanded      | 04                            |
| 9              | MS           | Dr. Babasaheb Ambedkar Marathwada University, Aurangabad | 15                            |
| 10             | Guj          | Bhavnagar University, Bhavnagar                          | 01                            |
| 11             | Guj          | Gujrat Vidyapeeth, Ahmadabad                             | 02                            |
| 12             | Guj          | M S University, Vadodara                                 | 01                            |
| 13             | Guj          | North Gujarat University, Patan                          | 09                            |
| 14             | Guj          | Sardar Patel University, Vallabh Vidyanagar              | 03                            |
|                |              | <b>Total Degrees Awarded</b>                             | <b>152</b>                    |

*Table 1.2 PhD degrees awarded in Western Indian Universities (Up to 2010)*

### ***1.12 Scope and Limitations:-***

The present work covers review of doctoral dissertation awarded in the university department of LIS (non agriculture university only) covered in the jurisdiction of western India i.e. Maharashtra, Gujrat and Goa. The scope of the study is restricted to 36 non agriculture universities in western India. There are around 36 universities associated with UGC plan and since inception of LIS courses in universities around 152 theses have been granted till 2010.

Out of 152 theses, 124 theses have been consulted and analyzed by the researcher. The universities, where research element is not available are excluded from the review. M Phil research is excluded from the study and only PhD research programs are considered.

The concepts of terms used in the dissertation connote the meaning as:

**1.12.1 References:** A list of items appended to a published work with bibliographic details.

**1.12.2 Citation:** A bibliographic description of a reference item, which gives information about the cited author, cited journal, cited year, etc.

**1.12.3 Citation analysis:** Citation analysis is nothing but analysis of citations or bibliographical references that have been used by the researcher or scholar while conducting research study or writing scholarly communication, these are appended either as a foot note or at the end of chapter or at the end of study in the form of bibliography. These citations are very useful to conduct research and find out trends in subject, authorship pattern, and use of documents.

**1.12.4 Doctoral dissertations:** Doctoral dissertation covers PhD thesis and dissertations. The term thesis and dissertations used as synonymous and called PhD thesis work.

**1.12.5 Bibliometrics:** Bibliometrics is defined as the application of mathematics and statistical methods to books and other media of communication.

**1.12.6 Cited Literature:** Cited literature is defined as literature that was cited by the citing document.

Since the study is mainly concerned with citation analysis of literature used by researchers in their research study in LIS. The main focus given in the present study is for citation analysis; a popularly used method of bibliometrics.

### **1.13 Features of Past Studies:-**

Previously many studies are conducted using citation analysis in different subject fields, but the present study has some different angles focused in selection of area and coverage etc.

1. It is found that there is no attempt made so far by the scholars in analyzing Library and Information Science research area, though studies are reported in agricultural sciences, pure sciences and social sciences etc.
2. The research conducted in Karnataka University, Dharwad, Karnataka entitled, "Citation Analysis of Doctoral dissertation in library and information science accepted by the universities in Karnataka. (Kannappanavar B U, Ijari S R, May 1991) is the study noticed in this area but its scope is restricted to single university (Dharwad) where as the present research study covers 20 universities from western India.
3. Sambhalpur University has awarded degree to Mishra R entitled "Citation Analysis of PhD dissertation in Library and Information Science accepted by the Universities of Orissa and Manipur till 1993: A Comparative study". This research study covers only two universities.

### ***1.14 Features of Present Research Study:***

The present study covers following,

- 36 non-agricultural universities from three states from western India.
- Library and information science area is basically covered in the study.
- The citations selected are large in number (16313 citations).
- Data analyzed through various angles in LIS.
- Gap in research is identified as well as list of emerging areas is also recorded.

Thus the present study has covered different aspects related to its scope, coverage as compared to previous studies.

### ***1.15 Structure of Research Study:***

***Chapter 1: Introduction:*** This chapter covers the importance of bibliometric and citation analysis studies and its value for research analysis. Chapter highlights the progress of research in India. The methodology covers in detail aim, objectives, and scope and research methods used for conducting study.

***Chapter 2: Literature Review:*** This chapter mainly covers the literature searched and evaluated for the study which is collected from various resources. This also covered the list of the theses and data collected from different universities. This literature review helped in building foundation and elaborating the concepts in the study.

***Chapter 3: Bibliometrics, Citations and Citation Analysis:*** This chapter describes the importance of citations and citation analysis in LIS and its application for assessing the trends and analyzing the impact of citations in defining policies and trends in LIS.

**Chapter 4: Progress of Education and Research in LIS:** This chapter highlights the developments in the LIS education and research. Similarly it focuses on the different areas of LIS in which research is conducted on large scale at national level.

**Chapter 5: Research Trends in LIS: Western Indian Universities:** - This chapter highlights the research activity in the area of LIS covering national and western India developments (three states) in detail. It covers research completed, and ongoing research activity, research trends, prominent research etc.

**Chapter 6: Data Analysis and presentation:** - This chapter covers the analysis of data collected from 20 universities and its interpretation. Based on this tabulated data, observations were derived related to status of university research, research completed, ongoing, and research guides available etc. The data analysis highlights mainly type of documents used (Books, journals, thesis, conferences other) by researchers, area of studies selected for research, format of documents used, , use of web sites, chronological distribution of citations, use patterns, author patterns, subject patterns, language, geographical, and territory patterns ( country) etc

**Chapter 7: Findings, suggestions and conclusions:** - This chapter is based on chapter 5 and 6 and the data analysis and its interpretation helped in deriving findings and drafting suitable suggestions to improve the research activity and productivity and conclude the study at the end with scope for further research.

**Bibliography:** - It represent complete list of references used for conducting this study.

**Appendices:** - There are five appendices for this study.

**Summary:** -

Education and research both have prominent importance in LIS sector. Recently since the technological use is increased in this area research has also more proliferated areas than before. LIS education is restructured at regular intervals and updated the syllabus to meet the demands in the profession similarly research is growing and now there is a necessity to evaluate the research conducted and analyse the emerging trends and gap in research areas in LIS. To analyse the research trends citation studies are more beneficial than any other method. This chapter highlight the importance of citations and citation analysis and its

applications, trends in LIS research and education in brief. (Detailed study is covered in chapter 3 and 4). Citation analysis developed by Garfield is used as a tool for better activities in libraries viz. in acquisition and periodical collection management as well as maintenance of collection in libraries. In acquisition it is used to fix collection development policies, resource sharing and priority to subscribe journals based on ranking and impact factor as well initiation in consortium programs. It is also useful for the researchers and in analysing the research trends. Reason for selection topic, aim, objectives, method used etc. is also detailed in this chapter. The following chapter covers literature review in detail and this has supported to the present study in fixing ideas and concepts.

### **References:**

- Association of Indian Universities (2010), AIU handbook. New Delhi, AIU.
- Barahona, Jesus M Gonzalez (2007), on the importance of publishing research results, libresoft seminar, Mostoles, March 13<sup>th</sup> 2007. Accessed at <http://libresoft.es> accessed on 15.03.2012
- Garfield, E., Citation analysis as a tool in journal evaluation. *Science*, Vol. **178**, p.471–479.
- Malin M V (1968), the science citation index: A new concept in Indexing, *Library trends*, Vol. 16, p.376.
- Meho, Lokman I. and Sonnenwald, Diane H. (2000), Citation Ranking Versus Peer Evaluation of Senior Faculty Research Performance: A Case Study of Kurdish Scholarship, *Journal of the American Society for Information Science*. 51(2), p.123. Accessed at <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.85.8879> accessed on 12-1-2011)
- Nann F et al (1976), Evaluative bibliometrics: The use of publications and citation analysis in the evaluation of scientific activity, cherry Hill, N J, Computer Horizon Inc. p. 334-337.
- Price, De Solla (1970). Citation measures of hard science, soft science, technology, and non science. In C. E. Nelson and D. K. Pollock (Eds.), *Communication among scientists and engineers*, Lexington, MA: Heath Lexington Books, p.3-22.
- Pritchard Alan (1969), Statistical bibliography or bibliometric, *Journal of Documentation*, Val. 25, p.348-349.

- Rana R (2011), Research trends in library and information science in India with a focus on Punjab University Chandigarh, *International Information and Library review* Vol. 43, p.23-42.
- Ranganathan S R (1969), Librametry and its scope. *The International Journal of Scientometrics and Infometrics*; Vol. 1, No. 1, (1995), p.15-21. (ISSN-0971-6696) (Original article in DRTC Annual seminar Bangalore: DRTC, ISI and sarada Ranganathan Endowment of Library Science 1969. Reprinted again in 1995 in JISSI)
- Ziman John M (1968), *Public knowledge: An essay concerning the social dimension of science*, Cambridge, Cambridge university press, p.58.



## Chapter 2: Literature Review

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## Chapter 2: Literature Review

### **2.1 Introduction:-**

Literature review is an objective analysis of contributions made by authors, researchers, experts including technical specialists on a particular subject area or research topic. It is a chronological presentation of growth and development of literature in a particular field over a period of time. The very purpose of a literature review is to understand the experimented methods, techniques and skills of a phenomenon and its procedural presentation. This is believed to guide the researcher to formulate and identify the objectives, hypothesis, methods for collection and analysis of data Literature review enables the researcher to restructure, reorganize and recast the presentation in light of work done at various levels. Therefore a literature review is considered as an integral part of research studies (Dahibhate, 2011). The review covers research articles, theses and dissertations, projects, reports etc.

The present review is grouped in following facets:

*2.1.1. Library and Information Science: Education*

*2.1.2. Library and Information Science: Research*

*2.1.3. Bibliometrics and bibliometric analysis*

*2.1.4. Bibliometrics Law*

*2.1.5. Citation analysis studies*

*2.1.6. Citation analysis studies in LIS*

*2.1.7. Web resource citation studies*

*2.1.8. Webometrics and scientometrics studies*

*2.1.9. Citation analysis study in other subject*

### **2.1.1. Library and Information Science: Education:-**

Asundi and Karisiddappa (2007) in their publication " Library and information science education in India: International perspectives with special reference to developing countries" made a detailed analysis of development and progress of LIS education in India and its features. The authors narrated the different levels of education system and also suggested the future trends in education. Rath (2010) and Higgins (2007) pointed out in their communication that education is one of the largest activities in the world and library supplements to fulfill educational goals and serve as a gateway for academic world. Authors emphasized the need of proper LIS education to provide better services to users from the

library. Singh (2003) in his article "LIS education in India Issues and Trends," revealed the status of LIS education in India and narrated the historical developments in LIS education since independence. He also explained different levels of LIS education offered by different universities in India. Author emphasized on the need for having a national level accreditation body to maintain uniformity and standards in LIS education. The study concluded with discussions on the problems in LIS education and suggested ways to solve these problems and the approaches to prepare the LIS professionals to face the growing challenges in the job market. Jain (2007) in his paper on "Library and Information Science (LIS) education and LIS professionals in India" indicated that currently both the traditional libraries and the digital libraries coexist in India. LIS education in India has not become receptive to the new emerging situation. The library schools have failed to develop the required knowledge and skills relating to the use of information technology among students. The paper discusses the challenges in LIS education in the Indian context. It deals with the preparing LIS graduates for leadership and support to management roles to and also to support national and economic development in India, collaboration and resource sharing among LIS schools. It also discusses the recent emphasis given on e-learning in LIS education in India.

LIS education has completed hundred years in 2011 and on this occasion Department of Library and Information Science, The University of Bardawan, Golapbag, Bardawan, West Bengal organized a seminar on the theme " A century of LIS Education in India: Past, Present and Future" during 2-4 February 2012. The main theme of the seminar was LIS education and in which sub themes covered were historical development of LIS education in India, changing practices in LIS education and trends, reshaping LIS courses, New components in LIS education, choice and credit based LIS education system, Accreditation issues, continuing education, Digital Library and Virtual Library based educational applications in syllabi, applications of ICT and web tools, international cooperation and collaboration. This seminar reflects the need of revamping LIS education tuned to present and future requirements. Similarly a conference was also organized by IATLIS in 2009 on the same theme and many scholars contributed their opinions in respect to LIS education. Karisiddappa and Asundi, Satija, Konnur and Dahibhate, discussed on the theme of LIS education. Kalra, Tripathi, Gadhvi, discussed on the LIS curriculum reorganization. Jagtar Singh and Malhan (2010) in their paper "Trends and issues in LIS education" identified the emerging trends and lingering issues in Library and Information Science (LIS) education in India, and suggested to align LIS education programs with job-market and end-user expectations. Ravi

and Mohan (2005) in their communication explored that the e-learning mechanism is required to provide for quality of Library and Information Science education at university level through the distance learning. The paper highlights LIS education in distance mode, developments of E-learning and LIS education in India, and universities are forced to face major challenges to adopt e-learning mechanisms, which are to design LIS programmes to fit into the e-learning environment, to provide quality education. The teachers as well as students are to be trained in the information technology advancement, to enhance LIS education e-learning consortium, collaboration, quality assurance with accreditation and cost effective were discussed in details to strengthening the LIS education.

Garg et. al. (2009), in his study reported that the craze for PhD in library science is also growing rapidly in India, and main reason is that today most of the universities are demanding for a doctoral degree in library and information science for faculties as well as for senior professionals in university and other higher educational and research libraries. This led to an increased research activity at various library schools in India.

**Summary:-** The above literature review highlighted major challenges in LIS education. LIS education in India is progressing and growing at an alarming speed (Asundi and Karisiddappa 2007). There are different levels of LIS education system and conduct courses at bachelors, masters and research programs i.e. M Phil and PhD (Rath 2010 and Higgins 2007). LIS education is a basic need for better management and providing library services to users. Authors have also suggested need of a national level accreditation body to maintain uniformity in LIS education system and curriculum needs to be updated regularly to face new emerging technologies (Jain 2007). Use of ICT is necessary to support and manage the emerging trends in LIS. Different skills have to be acquired by the LIS professionals to face the future trends. Distance learning and e-learning practices in LIS are implementing in nearer future and libraries have to look in to this aspect in terms of improving education system

### ***2.1.2. Library and Information Science: Research:-***

Wikinson (1983) rightly indicated in his paper "If librarianship aspires to become a profession, it should depend upon research to develop its knowledge base and its theoretical framework". This statement explains the need of research in LIS. Mahapatra and Sahoo (2004) indicated that there are many problems that libraries and librarianship faces due to

constant changes in the profession, and to solve these problems only research activities could be a useful measure. Further to enhance the human knowledge base and to develop better advanced tools and technique in LIS research helps in attaining such activities. Research is vital as it is a scientific method of enquiry, finding out something, creating new knowledge, going beyond experience and solves the issues. Chandrasekharan and Ramasesh (2009) in their research paper clearly projected the output of research in India and development of doctoral research in India with relevant statistical analysis. Attempt in the study depicted quantity of research output in the form doctoral theses grouped according to state, university, subject and supervisor / guide etc. The study concluded with indicating areas of research activity in LIS with ranking of universities and states which have contributed research in India. Satija (1999), Gupta (2010), also made similar studies and discussed the trends in LIS research in India. Patra and Chand (2006) in their communication LIS research in India conducted a bibliometric study of LIS research and concluded suggesting LIS research output from India needs to be flashed at international level instead contributing in Indian journals. Kannappanavar and Vijayakumar (2000) conducted a study on the occasion of completing fifty years of LIS research in India and illustrated the trends in research. Authors in their study reported traces and the trends and developments of LIS research in India for the past 50 years. According to the year 1992 is the most productive year for research output. Planning and management is the most favoured area for research by LIS researchers followed by user studies and bibliometrics. Karnataka University and its research guides are the most productive university and research guides in the field. Satija (1999) in his article presents a state-of-the-art overview of library and information science (LIS) education and research in India as a background to reviewing the doctoral research in the field. Author traces the origin and growth of PhD programmes in LIS in India and highlights the initiatives and efforts of Dr S. R. Ranganathan (1892–1972) in research. The article provides annual data on the quantitative output of LIS PhD theses and ranks major Indian universities by their output. It includes lists of the major areas of research and identifies some arid areas. Wagh (2011) reviewed research performed in Library and Information Science In India during the period 2004-08 and recorded research programs of PhD in LIS carried out in different universities in India .The data was analyzed and found out the areas of research receiving more attention or less attention, growth pattern, productivity of the universities and supervisors etc. Kumar (1998) reviewed the progress of research in India and analyzed the PhD research conducted during 1950 to 1997. The results deduced from the study reports subject wise analysis, guide wise analysis, state wise analysis, chronological analysis, university productivity analysis etc.

This study was very useful to the researchers in this field. Garg (2009) conducted a detailed study in the area of LIS research using a bibliometric study of citations. He covered the LIS research output during the period 1963-2008. His study identified various patterns like Chronological, guide wise, state wise, subject wise, university wise, language wise, etc. Kumar (1998), in his paper studied the research activity in Indian universities and his conclusion leads to findings that increased research activity at various library schools in India is reported. His paper provides statistics of doctoral research in India. The data of the doctoral research in India has been analyzed chronologically, subject-wise, guide-wise, and university-wise.

**Summary:** - The above papers reviewed the efforts of research activity carried out in India and authors opined that constant changes in library profession are visualized and research activity helps in solving the problems in various areas of LIS. Research activity helps in creating new knowledge and finding out solutions. In India research activity is growing fast and many efforts are made to analyze the progress stated by Chandrasekhara, Satija, Gupta, Patra, Chand and Kannappanwar. All these authors analyzed the research activities based on chronological growth, subject wise growth, university wise growth, state wise growth and guide wise growth ect. Though research activity started in 1957 but real growth was observed since 1992 in India. Prominent universities in India are conducting PhD programs and contributing in research activity.

### ***2.1.3. Bibliometrics and Bibliometric analysis:-***

Sen (1990), Sengupta (1988) have clearly expressed their views in respect of bibliometrics and stated that bibliometric analysis is used as a research technique and used to study the literature used in performing research by scholars in various subjects. Sengupta (1988) is of the opinion that the literature has grown tremendously and author felt that a survey is necessary to find out the trends of use of literature in biomedicine and find research trends. His article presents a review of different studies which includes themes like explosion of literature, identification of core journals, subject dispersion and geographical dispersion of literature. Sen and Chatterjee (1990), Sen (1989), Sengupta (1988) and Ravichandra Rao (1983) have already conducted bibliometric studies and presented an exhaustive review of

the trends in Indian bibliometric research. At the international level also such type of reviews were reflected and surveys made by Hejreppe (1986 & 1980) and Rousseau (1988) are the examples.

Kabir (1994), studied the authorship pattern and the extent of research collaboration in the field of LIS, based on data collected and analyzed from "LISA" an abstracting journal, for the period 1964-1990. The purpose of the study was to identify authorship trends and solo research using bibliometric studies. The study revealed that solo research is more favourable than the collaborative research. This indicates that in LIS solo research trend is visible. Diluvio (1989) in his dissertation, tried to find out contribution of Philippine scientists in periodical literature, and the sources cited by these scientists in their articles. A major source of data analyzed was from Science Citation Index for the period 1975-1985. All papers were published by Philippine scientists in English and appeared in international journals. The publication pattern was 39% appeared in US journals. The 53% of papers published by the international agencies in Philippines. Local Philippine scientist affiliated with these agencies contributes only 14% of papers. One third of papers from the international agencies published were co-authored by Philippine and Non-Philippine scientists. Citation analysis techniques were used to compare the extent of published Philippine literature. The study concluded with pointing Philippine scientists published papers in journals emanating from a wide range of countries but they contribute very little to the high impact journals as measured by citation. Scholman (1990), in his study tried to examine issues related education which is separate field and with the help of patterns of information transfer in health education research using bibliometric methods author focused on core journals in the field of health science, comparison of health education research with research from other disciplines and analysis of citations and researchers in health education.

Nweke (1989), identifies 260 journal titles cited 750 times in the Zoological theses submitted to the Ibadan University, Nigeria during 1970 and 1975. Author used Bradford's law for solving citation relation in 23 core journals. Noguchi (1988), attempted a bibliometric study in management. Unlike most contemporary sciences in Japan the subject of "Japanese style management" is special and it evolved out of Japanese standard management practice and was reorganized and praised outside Japan. This study apply bibliometric method and examined the characteristics of the literature on "Japanese style Management" in western languages and investigates Japanese contribution to the development of this subject. It was found that the literature is a little more scattered than Bradford's law predicts and that the

transfer of information about “Japanese style management” is carried out more by Japanese authors writing in Western languages than by publications used in Japan.

Nuria and Sabate (2008) conducted bibliometric study using citations in chemistry field. The citations from PhD dissertations were ascertained to find types of documents used, document most frequently used in the research process, the most frequently consulted journals and obsolescence rate of the journals etc. The analysis covered 46 doctoral theses submitted to Institute Químico de Sarriá (IQS) from 1995 to 2003. The results obtained from the analysis of 4,203 citations revealed that the most frequently used documents were scientific papers, which accounted for 79% of the total; 33 journals met 50 % of the informational needs; and the age of 50% of the citations was not older than 9 years. Finally, the results can be used as a tool for the collection management of the library. Tonta and Umut (2006), analyzed the bibliometric features of 100 theses and dissertations approved by Department of Librarianship, Hacettepe University, during 1974 and 2002. The research coverage of 24% thesis was on university libraries, followed by public libraries (9%). Doctoral dissertations appeared twice as long as master’s theses and contained 2.5 times more citations. Recently completed research work theses and dissertations contained more citations to electronic publications. Fourteen (3.2%) journal titles received almost half (48.9%) citations. Cited journal titles in master’s and doctoral theses and dissertations overlapped significantly. The mean half-life of all cited sources was 9 years. Single authorship was the norm in cited resources. The findings of the present study is used to identify the core journal titles in librarianship as well as to evaluate the existing library collections to decide which journal titles to keep, discard, or relegate to off-site storage areas.

Chaurasia (2008), in his article “Bibliometric Analysis of Annals of Library and Information Studies (2002-2006)” highlighted the fact that Bibliometrics is an emerging thrust area in research and has now become a well established part of information research and a quantitative approach to the description of documents. Bibliometrics has grown out of the realization that literature is growing and changing out of a rate with which no librarian equipped with traditional bibliographic skills and methods could keep abreast. In his study author shows that journals are most cited form of communication amongst the library and information scientists and the source journal is the most cited publication. The bibliometric analysis study of the journal “Annals of Library and Information Studies (2002-2006)” indicated trend of growth in contributions and on an average number of contributions of articles are 21.4 per volume. Majority of the library and information scientists prefer



collaborative research and contribute their papers jointly. Most of the contributions are on bibliometrics (36.45%). ICT and digital technologies in libraries and have also received sufficient papers. Author has also conducted institutional and geographical distribution of contributions library and information scientists have cited journals in large number (50.15%) while books at second level with 273 (19.96%) citations. 'Annals of Library & Information Studies' occupies the 1st rank, and 'Scientometrics' occupies 2nd rank in the ranked list of cited journals. Pillai and Kumar (2010), present study to determine the bibliometric characteristics of the biochemistry research conducted at University of Kerala, and presented subject wise break-up, bibliographic forms of cited documents, most cited journals, collaboration in authorship, etc. in the study. For this study and to find research trends in biochemistry at the University of Kerala, 168 doctoral dissertations awarded between 1966 and 2007 at the Department of Biochemistry of University of Kerala were used as a source for analysis.

Vallmitjana and Sabate (2008), conducted bibliometric study using citations from PhD dissertations of chemistry to ascertain types of documents most frequently used in the research process, and most frequently consulted journals and obsolescence rate of the journals etc. The analysis covered 46 doctoral theses presented at the Institute Químico de Sarriá (IQS) from 1995 to 2003. The results obtained from 4,203 citations revealed that the most frequently used documents were scientific papers, which accounted for 79% and 33 journals met 50% of the informational needs, The age of 50% citations was not older than 9 years.

**Summary:** - Bibliometric studies and citation analysis is used as a research technique for finding out trends in the subject and use of literature by the researcher as well as gaps in research hence laws of bibliometrics, citation analysis play the very prominent role in deciding different patterns. In LIS, citation studies are also proved beneficial for finding core journals and formulating collection development policy.

#### **2.1.4. Bibliometrics law:-**

Askew (2008), in his study used Lotka's law of scientific publication productivity using the methodology outlined by Pao (1985), in the field of Library and Information Studies (LIS). A data set of 1,856 citations was collected using *ISI Web of Knowledge* databases. In the study values of  $n$  and  $c$  were calculated i.e. 2.1 and 0.6418 (64.18%) respectively. This study finds

the amount of literature in the field of library and information studies and conforms to Lotka's law with reliable results. Lotka's law can be used in LIS as a standardized means of measuring author publication productivity. Pillai (2009), used bibliometric techniques and laws especially Bradford's Law of Scattering and a reviewed scholarly contributions. A study of five-year data from journals (2004-2008) cited by the physicists at the Indian Institute of Science (IISc), Bangalore was carried out to examine the applicability of Bradford's Law of Scattering, which include 690 periodicals containing 11,319 references collected from 79 doctoral theses during the period 2004-08. In the results presented ranked list of journals and four Physical Review-B with 9.53% citation, followed by Physical Review-A with 7.69% and Astrophysical Journal with 5.47% citations were the most preferred journals. Applicability of Bradford's Law in various methods was tested. Zabeed Ahmed and Rahman (2009), in their paper examined the validity of Lotka's law to authorship distribution in the field of nutrition research of Bangladesh. A list of periodical articles on different aspects of nutrition research published during 1972-2006 was compiled for analysis. Using "full productivity" of authorship, a total of 998 personal author names were identified. Lotka's law was tested using both generalized and modified forms, The results suggest that author productivity distribution predicted in Lotka's generalized inverse square law is not applicable to nutrition research of Bangladesh. Using least-squares excluding high productive authors and maximum likelihood methods, Lotka's law is found to be applicable to nutrition research in Bangladesh.

**Summary:** - Bibliometric laws like Bradford, Lotka are very popular and used to find different patterns including half-life literature in every subject area.

### ***2.1.5. Citation Analysis Studies:-***

Janakiramaiah and Doraswamy (2011), in their study examined the conference papers published, in the convention on automation of libraries in education and research institution (CALIBER) in the year 2005 and 2006. The analysis of paper cover different bibliographic forms used, average number of citations per paper, authorship pattern, different websites used, types of conference proceedings, geographical distribution and ranked list of cited journals. Das and Sen (2001) analyzed 1049 citations from 34 research articles of Journal of Biosciences; 2000. In their study it was found that out of the total citations, journal articles comprises 85.89% and monographs 10.1%. Ramesh and Nagaraju (2000) analyzed the citations from articles of Indian journal of Information, Library and Society. From 138 citing articles total citations were 901 i.e. on an average 7 citations were cited per article. About

67.5% of articles had 1-20 citations. More citations were from the books and periodicals than the other type of materials. Similar type of study was also performed by Koley and Sen (2003) covering 457 citations appended to 26 research articles published in four issues of the quarterly journal "Indian Journal of Physiology and Allied Sciences". From the total citation study it was noticed that about, 76.81% citations relate to journal articles, and 18.59% to monographs, and the rest to conference papers, theses, etc. Rethlefsen (2007) analyzed citation of journal articles authored by Minnesota Department of Health staff. Information on each cited reference was recorded, including reference type, relative age of citation, and journal name etc. The outcome of the study was that journals were the most heavily cited resource by the researchers (63%). Bhat & Sampath Kumar (2008) studied a citation analysis of research articles from scholarly electronic journals published in 2000-2006. The analysis focused on the extent to find which scholars are using web-based sources in scholarly electronic journals. Results of the study shows that 81.49% of articles published in selected 9 electronic journals during 2000-2006 had web references. Out of 25,730 references 56.54 % of references were for print journal and 43.52% of them were for web references. 437 citations from 32 research articles from two issues of the "Rawal Medical Journal" were collected by Javed and Shah (2008). The study revealed that 49.52 % citations pertained to journal articles and rest to other resource types. All the above studies except the last one reveals that journals are heavily cited and preferred source of information. In the above studies citations of journal articles were analyzed.

Slutz (1997) in his citation analysis study of 16 master's theses, analyzed the data based on gender of authors; documents used (book, article within book, journal article, thesis, dissertation); and place of publications etc. The research findings indicated that more male authored citations were appeared and most of information sources used were books, articles within books, and journal articles. Gooden (2001) performed a citation analysis study of dissertations, and from 30 dissertations collected 3,704 citations. Author found that journal articles were cited more frequently than monographs and 85.8% of the citations were for journal articles and 8.4% citations were for the monographs. 4,012 citations in 70 postgraduate dissertations in education were studied by Okiy (2003) and he found that most students in education stream use more textbooks literature (60.3 per cent), than other forms of library materials. Megnibeto (2006) studied the citations of dissertations of library and information science (undergraduate students) and found that the number of citations to internet resources was initiated but use is very low.

Dalia (1987), Analyzed funding policies in a more systematic method and scientific manner. The need of analysis is due to exponential growth of the scientific literature and obviously the population of scientists producing it. The search for such advice has been resulted in the development of a combined method of statistical analysis of the literature in the given field. The techniques employed were mainly citation analysis and epidemiological analysis. The high correlation between quality and citations by review articles justified the use of citation analysis technique. Pulla and Sharma (1988) in their research paper analyzed distribution of publications according to chronology. The analysis is based on number of authors contributed on various systems, classes of agents, forms of literature and finally by institutions. The publications of Environmental Mutagen Society provided a data of 491 publications. Collaborative authorship has been dominant pattern of contribution. Drugs and higher plants appear to be most preferred areas of interests in the subject fields. Seven periodicals have been identified as core by bibliometric study trends. Arvinda and Reddy (1990), analyzed around 3807 citations appended in review articles published in “Annual review of Anthropology” during the year 1980-1982. They found that 57.53% of the Sociocultural Anthropology literature is published in the form of books. The single author citations are more (87.21%) as compared to two, three and more than three author citations. Rank list of cited journals presented in the study indicated scattering of literature of socio culture anthropology in 270 periodicals. His study is useful to Anthropology area. Sharada and Devaki (1990), in their study analyzed the articles abstracted in “Linguistics and Language Behaviour Abstracts (LLBA)” vol. 11-21, 1977-87 were identified to find the authorship pattern, topics covered in linguistics and related fields. She found geographical distribution of authors, chronological distribution, most preferred periodicals of linguists, etc and presented in the paper. This study brings to the light the research output of the linguists in Indian. Articles published in journals at the international level during the past 10 year’s period and highlighted both the areas of interest and the neglected areas in linguistics.

Kannappanavar et al. (1991) studied the characteristics of literature in clinical psychology and tracked half-life and rate of obsolescence, using citation analysis techniques. The major findings of the study were obsolescence for books and journals which is reported as 16.13% and 14.29% respectively. The Annual Aging Factor (AAF) of cited journal literature in clinical psychology is 0.9425% and while that of books is 0.9475%. The utility factor for journal literature and books was found to be 14.29% and 20.00% respectively. Lal (1993), analyzed 6273 references from four volumes (Vol. 33-36; 195-88) “Indian Society of Soil

Science”. Based on citation analysis a ranked list of 50 most important journals representing 83.42% citations out of the 376 titles cited. The study revealed that 58.43% journal citations relate to only 6 journals out of 50 most cited journals. With regard to the ranked list of journals a comparison is also made with three previous lists. It gives a country-wise distribution of journals in the ranked list and chronological distribution of all references. Use of different kinds of documents as well as Indian and foreign have been shown with the help of tables and diagrams.

Karisiddappa et.al. (1990), studied the authorship pattern and collaborative research in psychology. The data collected from “Psychological Abstracts” for the year 1988 was selected for the study. The contribution of single author papers published were 39.43% indicating the trend towards multiple authorship (60%). The pattern of authorship varies from subject fields. The degree of collaboration in research is 0.6% in Psychology and ranged between 0.29% to 0.89% among the various subject fields. Beena (1996), analyzed the trends from the books published in Malayalam language. She analyzed subject wise and year wise distribution of Malayalam books in science, social science and humanities. The analysis indicated that there is an unbalanced growth of books in different discipline published in Malayalam language.

Chikate and Patil (2008), indicated in their research paper citation analysis is a worthwhile area of research. According to them citation analysis is useful for understanding subject relationships, author effectiveness, publication trends, and so on. The first recorded citation analysis was Gross and Gross (1927) who looked at citation patterns to determine the journals to be subscribed to and back volumes to be acquired for the library of Pomona College. They studied the citation frequency in the references given in the Journal of the American Chemical Society (Amudhavalli 1997). With citation analysis one can evaluate and interpret citations received by articles, authors, institutions, and other indications of scientific activity (Ravichandra Rao 1993).

Jadhav et al (2011), in their study using citation analysis analyzed all the journal articles published in ‘University News’ from January 2004 to December 2008. The citations gathered for the study were 5968. The study related that the maximum number of citations were referred publications 2007 to 2008 published from that is 2950 (50.6%), books are most cited type of document 1549 (26.39%), and maximum number of citations were from India i. e. 3675 (62.61%). In authorship pattern single author citations are dominant than others (3011

[51.30%]). Swanepoel (2010), used citation analysis technique to analyze the reference listed in 480 Master's and Doctoral (M & D) theses and dissertations submitted at the TUT between 2004 and 2007. The purpose of this study was to determine types of information sources used by Master's and Doctoral students at TUT, different patterns of uses across the 7 faculties of the university, and access to the journals that are mostly used by Master's and Doctoral students. More than 37,000 citations were analyzed in this study over the 4-year period. The study found several similarities but also some distinct differences in the use of information sources across the 7 faculties of TUT. It also identified more than 60 different information sources used by Master's and Doctoral students. With regard to journal use, the study found that out of 3,641 different journals cited, most journals were only cited once over a period of 4 years. Denick (2010), used citation analysis for the information literacy standards and assessment in higher education. This study explores the assessment of first-year engineering design students' information literacy skills in order to refine existing methods and library instructional strategies. A citation analysis is representing references cited in first-year engineering design reports from "Drexel University's Introduction to Engineering Design" program during the 2008-2009. Citation style was evaluated and identified as per resource type, and currency of each citation reported. From a sample of 234 citations, 38% of references were classified as websites, 28% of references were journal articles and 12% of references were books. The results of this study were compared to previous assessment efforts and aligned to the ALA/ACRL/STS Task Force on Information Literacy for Science and Technology's Information Literacy Standards for Science and Engineering/Technology. The methods and findings of this study demonstrate an evidence-based approach, focusing on standards-based assessment of engineering information literacy, specifically in how best to serve students, new to engineering research, design and communication.

Haddow and Genoni (2010), conducted a study of social science journals using citation analyses, for Australian journals to determine the differences between data collected from Web of Science and Scopus. The data was compared with the tier rankings assigned by disciplinary groups to the journals for the purposes of a new research assessment model, Excellence in Research for Australia (ERA). In addition to citation-based indicators analysis include an extended journal impact factor, the h-index, and a modified journal diffusion factor, to assess whether subsequent analyses influence over the ranking of journals. The study concluded with findings that the Scopus database provides higher number of citations for the journals. However, there appears to be very little association between the assigned tier

ranking of journals and their rank derived from citations data. Duzyol et al (2010), studied the mapping of co-citations in open access which is one of the major research trends and hottest topic in electronic publishing. Authors maps the intellectual structure of open access based on 281 articles that appeared in professional literature on the topic between 2000 and 2010. Using bibliometric and co-citation analyses, co-citation patterns of papers presented co-citation maps. Cite Space software was used to analyze and visualize co-citation maps. Maps show major areas of research, prominent articles, major knowledge producers and journals in the field of open access. From the study most frequently cited journals by the authors are listed. The most recent research topics appear to be institutional repositories, open access publishing/open access journals and scientific communication. The preliminary findings show that open access is an emerging research field, and this study is used to identify landmark papers along with their impact in terms of providing different perspectives and engendering new research areas.

Podlubny (2004), studied impact of citation distributions in different fields of science for the years 1992, 1994, 1996, 1997, 1999, and 2001. He found that the ratio of the total number of citations of any two broad fields of science remains close to constant over the analyzed years. Based on this observation, normalization of total numbers of citations with respect to the number of citations in mathematics is suggested as a tool for comparing scientific impact expressed by the number of citations in different fields of science. Biglu (2005), in his research study analyzed a total number of 432 German journals in 2000 and 427 journals in 2005 listed in the Science edition of the Journal Citation Reports (JCR). The study showed that the proportion of German journals added in JCR data bank in 2005 counted 4%. (From a total number of 6,088 journals in the JCR, 427 (7%) were published in Germany). The 6,088 journals in the JCR published 847,114 articles out of there 50,276 (6%) appeared in the German journals. They have 22,353,992 citations in 2005 out of these 861,190 (4%) came from German journals. Gooden (2001), made a citation analysis study of dissertations accepted in the Department of Chemistry at Ohio State University between 1996-2000 to determine information use. He studied 30 dissertations and analyzed 3,704 citations. His study analysed types of resources cited, currency of literature, and dissertation topics. The current results compared with past research by other authors and concluded that Journal articles were cited more frequently than monographs, (85.8% of the citations were journal articles and 8.4% of the citations were monographs). Das and Sen (2001), conducted a study based on 1049 citations listed in 34 research articles from "Journal of Biosciences, Vol. 20(2-

4) 2000". In their study they found the authorship pattern indicating 18.68% per cent papers are single-authored, 52.71 per cent are double- and triple-authored, and the remaining 28.61 per cent are joint contributions of four or more authors. They have pointed out that in medicine; the author team is more than those in the fields of chemistry and physics. Sometimes mega-authorship (i.e. contributions by ten or more authors) has been traced in studies, and one of them was having 22 authors. From the citations analysis of various types of information resources, journal articles comprised 85.89% and monographs 10.1% and Indian contributions reported 5.53%. From the citing articles 30 are by Indian authors, 3 by foreign authors, and 1 (2.94%) jointly by Indian and foreign authors. 10.87% are self citations in which 0.57% are journal self citations.

Martens (2001), in his article suggested that the citations can be viewed not only as a "concept symbol" but also as a "boundary object". The scientific, legal, and patent citation systems in America are examined at the micro, meso, and macro levels in order to understand how they function as co modified theories of truth in contemporary knowledge representation. This approach also offers a meta-theoretical overview of existing citation research efforts in science, law, and technology that may be of interdisciplinary interest.

Meho and Sonnenwald (2000) conducted a study to analyze the relationship between citation ranking and peer evaluation of performance of faculty. The study was based on sources of peer evaluation data, citation content analysis and book review content analysis, to find citation ranking and correlate with data from citation content analysis, book reviews, and peer ranking. The authors would like to assess whenever citation ranking is a valid evaluative indicator of research performance of senior faculty members. Analysis shows that normalized citation ranking and citation content analysis data yield identical ranking results. Analysis also shows that normalized citation ranking and citation content analysis, book reviews, and peer ranking perform similarly. Citation analysis contains data to indicate some specific and important insights into the quality of research. The study shows that citation ranking can provide a valid indicator for comparative evaluation of senior faculty research performance.

Kayongo (2011), in his study focused on determining the extent to which collections of the Hesburgh Libraries of Notre Dame met the needs of graduate students. His study covers the data from 2005-2007 and using citation analysis of 248 dissertations focused on the different aspects. The data analysis showed that over 90% of the 39,106 citations were for books and journals. The Libraries owned 67% of the items graduate students cited in their dissertations.



The Libraries owned 83% of the Arts and Humanities, 90% of the Engineering, 92% of the Science, and 75% of the Social Sciences sources in the top 1000 most cited titles, indicating a need for funding for further development of Social Sciences collections in the Hesburgh Libraries. Kumar and Kumar (2011), in their paper analyzed 8093 citations appended in the Journal of Oilseed Research (JOR) published during 1993 to 2004. Out of 8093 citations 5642 are given in main articles and 2551 in short communications in JOR. They also analyzed types of documents cited and identified core journals in the area. They analyzed authorship patterns, and Geographical distribution of cited references. The study concluded indicating that only 20 core periodicals cover more than 50% references and also indicated that collaborative research is a new trend in oil seeds research

Datta and Sen (2000), studied the 743 citations appended to 41 research articles published in the January to April 2000 issues of "Indian Journal of Pure and Applied Physics" the articles being contributed by 124 authors (117 Indian and 7 Foreign). Their study results show that solo research in physics is still quite sustainable (25%) in Indian team. Research is of course the most prevalent form of research where the team size is rather small ranging usually from two to four researchers. Journal articles account for 83% of the total citations and the ratio of Indian to Foreign citations is found to be almost 1:8. The percentage of author self citation is found to be slightly more than 17% and that of journal self citation just 3.6%. the ratio of Indian affiliated citing authors to foreign affiliated citing author is 6:3:1 of the citing articles, 3 are single authors, 17 are two authors and 10 are three authors, 6 are four authors and four are five authors in the case of 27 articles no inter institutional collaboration was involved for the remaining 14 articles.

Bill (1996), identified Seven faculty members from statistics department and their contribution in published research in 1993 and the first half of 1994 was collected and a citation analysis was conducted at the university library, where distinct discipline based collection development policies are now being formulated. Two citation patterns were identified by author, bibliographic and non-bibliographic citations. Bibliographic citations (from the bibliography) numbered 394 from 122 titles. Journals and monographs were the two formats most frequently cited, 46.7% and 36.9%, respectively. The average age of a citation was 12.3 years. The two most frequently cited journal titles were, Journal of Time Series Analysis and Stochastic Processes and Their Applications. Non-bibliographic citations (not found in the bibliography) were used to identify the more important research topics to this population of faculty.

Tilak et al (2010) analyzed the impact of library holdings in terms of physical and online access of doctoral studies in Tezpur University based on citations appended to the PhD dissertations in four subjects covered under the School of Science & Technology. Two latest dissertations (degree awarded) from each subjects were selected and studied. Category wise distribution of the cited items viz. journals, books & monographs, conference proceedings, electronic sources, web citations and others have been studied. Category wise percentile distribution and availability of cited items in the parent library have been calculated for journals and books followed by preparation of rank list of journals for each four subjects studied. Using statistical and bibliometric parameters. The findings were useful to re-engineering of collection development policy of the university libraries.

Dervos et al (2006) have proposed new citation indexing paradigm i.e. the Cascading Citation Indexing Framework (c2IF). It improves the way research publications are assessed for their impact in promoting science and technology. In this analysis given a collection of articles and their citation graph, citations are considered at the (article, author) level. Each article is uniquely identified by means of the Digital Object Identifier (DOI, <http://www.doi.org>). To identify each author uniquely, a Universal Author Identifier (UAI) scheme is established. Citations (article, author) pairs, citation paths that target each citing article are also considered. The granularity of the paradigm is further increased by introducing the concept of the chord, whereby a citation path of length one co-exists with paths of length two or higher, involving the same source- and target- articles. Reed (1995), in his article stated that promotion or tenure of faculty members are increasingly judged more by quality than on the quantity of their scholarly publications. As a result, author wants help from librarians in locating all citations to their published works for documentation in their curriculum vitae. Citation analysis using Science Citation Index and Social Science Citation Index provides a logical starting point in measuring quality, but the limitations of these sources leave a void in coverage of citations to an author's work. This article discusses alternatives and additional methods of locating citations to published works.

Brennen (1978), studied citations, indexed in "Tropical Diseases Bulletin" for a forty-eight month period (1972-1975) were analyzed according to the journal in which they were published and the language in which they appeared. The results of the study conformed to Bradford's law of bibliographic distribution. The reference scattering coefficient was determined to be 0.504, which indicated a high concentration of articles in relatively few journal titles. A rank order list of sixty-one journals was given as an appendix. The study

noted that English is the most important language in all the literature in terms of productivity. The results of the study may be used as acquisition tool for developing journal collection in tropical medicine.

**Summary:** - Many authors used citation analysis method to find the productivity in different subjects. All the studies pointed out that Journal articles are more used followed by books and other literature. The study reflected less use of e-publication but its use is increasing slowly since past few years (Jan Rosy, 2009). The authors also tracked geographical, chronological and authorship pattern in different subject areas. Citation analysis study is also useful for judging by scholarly publication published based on the citation analysis technique science, citation index, Scopus, Web of Science are generated, now a days for a article or patent pre and post citations are also made available in the databases.

#### ***2.1.6. Citation analysis studies in LIS:-***

Mahapatra (1995), Chang-Ping Hu et.al (2011), in their paper revealed the relationship and structure of library and information science (LIS) journals in China. For this purpose 24 core LIS journals in China were selected and the relevant data of journal co-citation retrieved from Chinese Journal full-text database constructed by China National Knowledge Infrastructure during the period of 1999–2009. Using cluster analyzing multidimensional scaling analysis and factor analysis, they analyzed the data of journal co-citation.

Vaishnav and Dharmapurikar (1990), surveyed and analyzed literature published in “Herald of Library Science” for 10 years (1977-1986) and selected 202 articles having 1370 citations. The study aimed at reviewing the citation patterns. They found that 89% of citations and covered from books and periodicals. Indian documents were preferred more in which 70% citations were self cited; 80% journal citations were found from library science journals. The main purpose of study was to find, citations per article, types of document cited, geographical distribution of journals cited, obsolesce of library literature, chronological distribution of citations, ranking of authors cited, language cited, self citations, bibliographic coupling , co - citations, frequency of periodicals used and ranking of journals etc. The study concluded with findings and suggestions. Mahapatra (1992), analyzed the influence of Ranganathan’s work published in the form of literature in the field Indian LIS. Author selected the articles published in journals, “Annals of Library Science and Documentation” “Herald of Library

Science” “IASLIC Bulletin”, “ILA Bulletin” and “Library Science with a Slant to Documentation” published during 1975 to 1985. The study reported that books written by Ranganathan were cited more often than articles. Similarly Mahapatra (1995) conducted another study to analyse three top ranking Indian journals i.e. “Annals of Library Science and Documentation”, “Library Science with a Slant to Documentation” and “Herald of Library Science” to analyze the factors for ranking at top position. Author studied different features like citing and non-citing articles, rate of citations per article, self citation behaviour, author’s collaboration, type of document cited and regency of cited document etc. He is of the opinion that these features may be included in the ranking of journals rather than simply counting of citations. O’Conner (1979), in her doctoral dissertation she assessed the dissertations submitted to library science. A study covers 1206 library science dissertations submitted between 1925 and 1975 in social sciences citation index (SSCI). The study reports that 789 citations from 312 dissertations of LIS serials cover 43.3% of the total citations, 69.6% citations indicated the use of dissertations in their contents which formed a considerable part of the total contribution of source material. Vij (2001), in his article provides a brief sketch of the library and information science abstract database for period. 1969-2000 covering 550 journals with over 206091 abstracts. Author highlights the advantages of LISA database and reported results, which pointed out that LISA includes 550 library and information science journals in its database. Its coverage of journals from the developing countries are relatively poor, only 24 Indian journals are covered and this figure varies from year to year. The coverage of Indian periodicals and papers is only 4.55% of the total journals and 1.67% of the number of records respectively in this bibliometric study. LISA database was analyzed to investigate year wise distribution of records, subject areas covered. Evolving and decaying subjects, language wise distribution of records country wise distribution of records, authorship pattern, ranked list of Indian and foreign journals, time lag in the coverage of Indian journals and shortcomings of LISA CD-ROM database. His study concludes indicating that there is a still room for coverage of Indian journals in LISA database.

Schneider and Borland (2004), in their paper used bibliometric technique to the research area of knowledge organization more precisely in relation to construction and maintenance of thesauri. This paper reviews related work that has been a inspiration for the assembly of semi automatic bibliometric based approach for construction and maintenance. Similarly the paper discusses the methodical consideration behind the approach. Eventually the semi automatic approach is used to verify the applicability of bibliometric methods as a supplement to

construction and maintenance of thesauri. In the context of knowledge organization the paper outlines two fundamental approaches to knowledge organization, that is the manual intellectual approach and the automatic algorithmic approach. Bibliometric methods belong to the automatic algorithmic approach though bibliometrics do have special characteristics that are substantially different from other methods within this approach.

Nishavathi (2007), identified research trends in LIS in India based on subject or area analysis. She identified major subjects like management, information seeking behaviour, information storage and retrieval, LIS education, LIS legislations and movement etc. Among every subject she identified subthemes in which she had listed few elements like, economics, LIS system, personal and financial management, planning of library information centres, information use, information management, information seeking behaviour, information sciences retrieval, classification, cataloguing, indexing, library and information services, collection development, User education, reference service, automation, networks for resource sharing and citations. According to Nishavathi (2007), trends in filling PhD thesis in India during 1950-2004 are

| <b>Year</b> | <b>PhD theses</b> |
|-------------|-------------------|
| 1950-1979   | 12                |
| 1980-1989   | 76                |
| 1990-1999   | 144               |
| 2000-2004   | 97                |
| Total       | 229               |

*Table 2.1: PhD theses in India during 1950-2004*

From her study she pointed out that growth of LIS research is reported since 1990's. She has pointed out that major research was carried out in academic (70%) library activities followed by special libraries 16% and then universities libraries 14%. This data indicate that research in academic libraries are more, where as more research is required in management, including webometrics and scientometrics, ICT, information literacy and digital libraries based research as well as.

Shi-Jian Gao et al (2009) in his case study which is based on citation analysis of 56 PhD theses submitted in 2005 at Wuhan University ([www.whu.edu.cn](http://www.whu.edu.cn)) in China. The authors

analyzed 10,222 citations from theses in library and information science, biology, Photogrammetry, remote sensing, and stomatology, and also compared the characteristics of the literature cited in the four disciplines. The results revealed that in the area biology and stomatology mainly English language publications were cited more whereas in the field of LIS, the cited literature came primarily from Chinese sources. In photogrammetry and remote sensing, citations were almost evenly split between English and Chinese sources. The results of study are useful for library collection development policies and other technical services.

Rekha and Parameswaran (2002), analyzed the issues of “Journal of Knowledge of Organization”, an international, journal the study covers 12 volumes published from 1988-2000. The study covered year wise and subject wise distribution of contribution, authorship pattern, author productivity, institutional affiliation and geographic distribution of contributors, prolific contributors to the journals etc. The outcome of the study indicated that in the field of knowledge organization from the total citations 167 out of 214 contributions are by single authors. It is found that the major topics included in the journal are classified on knowledge organization, information retrieval system, linguistic and terminology, subject cataloguing, indexing thesaurus, categorization, natural language processing and artificial intelligence. Ghosh (2000), analyzed 1374 citations from 117 contributions published in “Library Science with a Slant to Documentation and Information Studies” Vol. 32-36, shows that the contributing authors are mainly working librarians or library professionals than that of the teaching faculty. Eugene Garfield is most productive author as the trend of contributing articles were mainly on bibliometrics or citation analysis during 1965 to 1997. “Library Science with a Slant to Documentation and Information Studies” is the most cited journals followed by the ‘current content’. Co-citation and bibliographic coupling strength has been counted by authors to observe the interdependence of the cited documents. He highlighted that the contributors most frequently refer and cite to the journals in which they write. Saxena et al (1999) presented in their paper the software developed at DESIDOC for ranking of performance. Indian scientists and technologies are ranked based on the citations to their publications covered in science citation index (SCI). The software developed by DESIDOC provides facilities like generating reports based on highly cited authors, highly cited journals, highly productive institutions weight age of authorship etc quickly. This measure could be one of the important parameters for rating the performance of scientists for giving awards, promotions or other career incentives and for making appointments to important positions. Thus it is found that not only citation analysis is valuable but development of software for

ranking and making the task easier also shows important of citation analysis is various studies.

Deshpande and Rajyalakshmi (1997), conducted a study of 65 dissertations in library and information science submitted to Nagpur University during the period 1990-94 which reveals that majority of the works are in the field of literature survey and trends in various aspects of library and information science. Citation analysis has been carried out to find the types of cited sources materials authorship pattern and chronological distributions of cited references. The ranked list of cited references and journals indicates the annals of library science and documentation is the most cited journals by the researcher. Akiko (1976), in his study of citation analysis of thesis in LIS collected citations from 113 graduation theses submitted to Keio University School of Library and Information Science (SLIS) in 1973-74. After detailed study he has reported some findings like 62.2% of all citations (3,996) were to journals; more than 50% literature cited was within 4 years, citations to foreign literature was 23.1%; 9 titles accounted for more than 50% of citations to domestic journals, and 8 titles gave corresponding coverage of foreign journals. The Keio University Libraries and information centres (holding 80.8% of cited material) were shown to be important information sources for students.

Kubota (1976), analyzed the citations from 113 graduation theses submitted to Keio University School of Library and Information Science (SLIS) in 1973-74. Some of his findings were 62.2% citations (3,996) were to journals; more than 50% literature cited was 4 years old; citations to foreign literature comprised 23.1%; 9 titles accounted for more than 50% of citations to domestic journals, and 8 titles gave corresponding coverage of foreign journals. The Keio University LICs (holding 80.8% of cited material) have shown while conducting research important information sources have to be used by students. Sellen (1984), while conducting citation analysis of articles appeared in College and Research Libraries (C&RL) and Journal of Academic Librarianship (JAL) issues in 1981 revealed that academic librarians use more periodical articles than monographs in research and majority of references in periodical and monographs were appeared post 1975.

Ramesh and Nagaraju (2000), in his article analyzed the citations for article appeared in Indian Journal of Information, Library and Society (IJILIS), during 1995-1999. This journal has received about 7 citations per article, and 67.5 % of articles had 1-20 citations. More citations were from the books and periodicals than the other type of materials. Tendency of

authors seems to cite indigenous work more as compared to the documents published in other countries. out of 138 citing articles, 37 articles have no references. Dr. S.R. Ranganathan was first in the rank of authors whose valuable books have been utilized by several researchers more frequently and has 32 citations. Second Ranked author was Kalyane having 25 citations followed by Shukla (12 citations), Kaula (11 citations), Venkatappaiah (8 citations), Grogan (7 citations), Lancaster (5 citations), Guha, Gupta and Krishna Kumar (4 citations each), Mittal (3 citations); and Neelameghan (2 citations). English language was dominating amongst the cited articles, and it is sent percent. Only 14% citing authors had tendency of self citation, co-citation cases are 110, and only a couple of cases being repeated. More than 90 % citations were from library and information science journals. Each Journal received on an average of 7 citations.

Taylor and Dillon (2008), in their paper examines the impact of key authors in “Information Systems Research” from 1986 to 2005 and analyzed changes in influence and research interests over this period. The author set was based on publication counts in top information systems journals, supplemented on a reputational basis with authors recognized for their contribution to their field. Citation analysis was used to identify the most influential authors and to examine changes in influence over five-years. The results to their study show that certain key authors have exerted strong influence throughout the twenty-years, but for a new set of authors influence has begun to emerge in the last five years.

Keat and Kiran Kaur (2008), in their study applies citation analysis method to examine the use of information resources by students of the Master in Library and Information Science (MLIS) at the University of Malaya while preparing their dissertation. References from 40 MLIS thesis submitted during 2000-2005 were examined. The analysis was reported for author, source title, bibliographic format, language, subject category, and place of publication etc. Core journal titles listed and also compared with Journal Citation Report (JCR). The study pointed out that journals and books are the most used sources and there is a steady increase in the use of electronic media by LIS researchers. Authorship pattern indicates preference for single authored works. This study serves as a baseline indicator for resources used by LIS researchers. This study is utilized by librarians to focus on collection development to support research needs. Chia (2007), used citation analysis method and applied to reveal the information behaviour, network among scholars and identify the research trends to enhance the information services. In his study, the author examined the PhD dissertations of students from Life Science from National Chung-Hsing University in



Taiwan and the references cited in those dissertations analyzed approach to reveal the trends of student's research environment.

Tim and Halperin,(1976), studied characteristics of literature cited and used in library science doctoral dissertations, Data is tabulated for United States and foreign publications, age of cited work, number and frequency of citations, library science subjects, and subjects in other disciplines etc. Jan Rosy (2009), studied citation analysis of all the journal articles published in the "Library Trends" from 1994-2007, 593 articles were published in this journal during 14 years span. Highest numbers (52) of articles are published in 2004. The Journal contained 15662 references in which 13783 are p-citations and 1879 are e-citations. Every issue published about. 11 articles and each article have an average of 23.2 p-references and 3.1 e-citations. It was found that 44.51 % print books are consulted by the authors and 0% e-books are accessed. Authors have consulted 44.04% p-journals as against 11.82% e-journals. Figures shows that 88.14% other web references are used in the articles reference. Author found in his study gender contributions and pointed out that female contribution are (52.34%) where as male contribution was 47.66%. Philipp and Walther (2007), In their study analyzed 3.889 records which were indexed in the LISA database. They pointed out the core journals in the field using Bradford's Law of Scattering (pure quantitative calculation), Egghe's Journal of Infometrics (JOI) first issue to appear in 2007, comes most probable at the right time.

**Summary:-** Many citation analysis studies are also conducted in LIS to asses productivity in the area to find use of literature by the researchers, as a tool for preparing selection and collection development policy, qualitative resource collection, providing new services etc. citation analysis in LIS is applied to find out different patterns like geographical, chronological, authorship pattern, rank list etc.

### **2.1.7. Web Resource Citation Studies:-**

Casserly and Bird (2003), in their study "Web citation availability: Analysis and implications for the scholarship" analyzed five hundred citations for internet resources from articles published in library and information science journals published in 1999 and 2000. The bibliographic information is not properly reported and most of URLs are pointed to the content pages of "edu" and "org" domains and did not include a title. More than half citations (56.4%) were permanent. 81.4% were available on the web and searching the internet archive

increased the availability rate to 89.2%. Zandian (2009), in his survey (electronic/print) cited papers appeared in LIS thesis of MA degree, found a unique and comprehensive pattern of resources used by students in 5 universities, (Iran University of Medical Sciences, Tehran University, Tarbiat Modares University, Azade Shomal University and Azade Olome Tahghight). A citation analysis approach was used for analysis. 259 MA theses of LIS in the five universities were selected as population of survey. The outcome of study was, English print and electronic papers are highly cited in the period of the study with exception of Iran and Olome Tahghight universities. Alireza (2005) studied the web usage in her study and reported that the Web is a growing organism and one of the most important characteristics of the Web is that, a web page has ability to link to other web pages through hyperlinks. Since 1996, hyperlinks have been studied extensively by applying existing bibliometric techniques to the Web (Larson, 1996, Ingwersen, 1998). The Web affords rich opportunities to apply and adapt bibliometric techniques to new contexts and content

Kousha and Thelwall (2007), in their paper introduced a new data gathering method “Web/URL Citation” and used it for Google Scholar as a basis to compare traditional and Web-based citation patterns across multiple disciplines. For this purpose authors prepared a sample of 1,650 articles from 108 Open Access (OA) Journals published in 2001, from four scientific areas and four social science disciplines. They recorded the number of citations from sample articles selected from ISI Web of Science, Google Scholar and the Google search engine (Web/URL citations). For each discipline, they found significant correlations between ISI citations and both Google Scholar and Google Web/URL citations; with similar results when using total or average citations. Google Scholar citations were more than ISI citations in four social science disciplines as well as in computer science, suggesting that Google Scholar is a more comprehensive tool for citation tracking in the social sciences and perhaps also in fast-moving fields where conference papers are highly valued and published online. The results for Web/URL citations suggested that counting a maximum of one hit per site produces a better measure for assessing the impact of OA journals or articles, because replicated web citations are very common within individual sites. Yang and Meho (2006), in his study covered citations from researchers and evaluated faculty members. Author indicated that faculty members are trying to identify as many citations to their published works as possible to provide a comprehensive assessment of their publication impact on the scholarly and professional communities. The Institute for Scientific Information’s (ISI) citation databases, which is widely used as a starting point if not the only source for locating citations,

they presents a case study comparing citations found in Scopus and Google Scholar with those found in Web of Science, for items published by two Library and Information Science full-time faculty members.

Ruimin et al (2009), studied author co-citation analysis (ACA) which is an important method for discovering the intellectual structure of a given scientific field. Since traditional ACA was confined to ISI Web of Knowledge (WoK), the co-citation counts of pairs of authors mainly depended on the data indexed in WoK. Fortunately, Google Scholar has integrated different academic databases from different publishers, providing an opportunity of conducting ACA in wider a range. In their paper, they conducted ACA study in information science in China with the Chinese Google Scholar. 31 most important authors of information science in China were selected as research objects. In the part of empirical study, factor analysis is used to find the main research directions of information science in China. Pajek, a powerful tool in social network analysis, is employed to visualize the author co-citation matrix as well.

Sandra (2008), assessed the impact of online journals on citation patterns by examining whether researchers were more likely to limit the resources they cited to those journals available online rather than those only in print. The outcome of study pointed out that number of journals cited each year continued to increase. On the large urban campus, researchers were not more likely to cite journals available online or less likely to cite journals only in print. At the regional location, at which the number of print-only journals was minimal, use of print-only journals significantly decreased. The study concluded indicating that journals available in electronic format were cited more frequently in publications from the campus whose library had a small print collection, and the citation of journals available in both print and electronic formats generally increased over the years studied.

### ***2.1.8. Webometrics and Scientometrics Studies:-***

Moradi et al (2006), compared role of web 1.0 and web 2.0. Authors studied the activities of Iranian librarianship weblogs using webometrics methods. The results of study indicated that only 28 weblogs are active out of 46 Iranian librarianship blogs which are updating day in and day out. This study also indicates that there are only three cooperated weblogs and almost all of them use Iranian hosts, mostly Blogfa. There is only one weblog which is hosted by Blog sky. The language assessment of the survey shows 25 Farsi weblogs, two English weblog and only one bilingual (English and Farsi) among those 28 active blogs. The survey

ranked aforementioned weblogs using total links, self-link, inlinks and web impact factor (WIF).

Meho and Rogers (2008), in their study authors examines the differences between Scopus and Web of Science and analyzed citation counting, citation ranking, and h-index of 22 top human-computer interaction (HCI) researchers from EQUATOR (a large British Interdisciplinary Research Collaboration project). Results indicated that Scopus gave more coverage to HCI literature than Web of Science. No significant differences were found between the two databases when citations in journals are only compared. The study concludes that Scopus can be used as a sole data source for citation-based research and evaluation in HCI, especially when citations in conference proceedings are sought. Meho and Yang (2006), in another study examines the effects of using Scopus and Google Scholar (GS) on the citation counts and rankings of scholars as measured by World of Science (WoS). The paper discussed the strengths and weaknesses of WoS, Scopus, and GS, and brought out their overlap and uniqueness, quality and language of the citations, and the implications of the findings for citation analysis. The study involved citation searching for approximately 1,100 scholarly works published in about 200 articles. More than 10,000 citing documents were examined in the study.

Boell (2007), used scientometrics method of analysis scientifically from academic disciplines, journals plays an important role in disseminating findings of research among the disciplinary community members. In this study he analyzed six databases focusing on LIS literature: INFODATA, Current Contents, Library and Information Science Abstracts, Library Information Science Technology Abstracts, Information Science and Technology Abstracts, and Library Literature and Information Science, and listed the core journals in areas of LIS. Journals were also ranked by the number of occurrences in multiple databases in order to identify 'core' publications. The number of journals overlapping among databases is estimated and a matrix giving the overlap is visualized using multi dimensional scaling. In his study he prepared a comprehensive master list of 1,205 journals publishing articles of relevance to LIS. About 968 active journals were published in English, in which one third of the journals and published from the US and another one third from the UK and Germany. Nearly 16% of all journals are open access, 11% have a ISIJIF, and 42% are peer reviewed. Fifteen core journals are identified and a list of the top fourteen journals published in Germany was reported. The aim of compiling a comprehensive list of LIS journal was achieved by author.

**Summary:** - From this search literature is observed that along with citation analysis, bibliometric studies now webometrics and scientometrics studies are being conducted to analyses, the trends (WOS and GS are playing major role).

### ***2.1.9. Citation Analysis Studies in Other Subject:-***

Meadows (2004), examined the citation characteristics of papers in the monthly notices of the Royal Astronomical society (especially for the years 1963-1965) as means of studying the usage of astronomical literature in UK. The decrease of usage which has been investigated and the half life determined. Particular attention has been given to the immediacy effect and to its possible variations in different sub fields of astronomy. The citations have also been separated according to journal of origin. As a result of this study a quantitative estimate has been made of the titles and back runs that are required to satisfy a given percentage of the demand for astronomical research literature in this country. Suryanarayana (2000), conducted studies using citation analysis in subject areas of their institutions i.e. Tobacco for evaluating the utility of journals, monographs, conference proceeding and other literature by the users. "Tobacco Research Journal" published by Indian Society of Tobacco Science, is analyzed. Rajahmundry from 1987-1997 which covers 69% main articles and 31% sort communications. The analysis related that the journal received more articles from CTRI and it is observed that there was no specific ratio of publishing of main articles and short communications in the journal. In general the average citations to main article is 9.2% (ranging from 7.4% to 12.9%) and for the short communications is 5.9% (ranging from 4.1% to 7.1%) single author contributions were less i.e. 6.2% and two and more than three author contributions were more than 32.1% each. 74.4% of citations are mostly from periodicals and Tobacco Research Journal was cited 382 times in there citations. Only one paper from India was cited 10 times and one paper from foreign journal was cited 24 times. The study concludes that periodicals citations are mane and in which TRJ is more cited . Bill (2000), performed a study in the area of environmental science using citation analysis of local faculty from the Texas Tech University Library (TTU). The purpose of his study was to characterize the citation patterns of the interdisciplinary field of environmental and human health as compared with other disciplines and to apply the results to collection development. Twenty-four articles were selected from 1996 and 1997 with over 1600 citations to more than 950 listed references. The average age of citations was 10.5 years for journals and 9.4 years for books. On average, journals were cited 67% of the time while books were cited 17% of the

time. Proceedings, theses, and technical reports were also cited but that data was not applied to collection development. The impact on collection development has been to identify a small number of specific books which were frequently cited but were not in the collection and to identify important subject terms with which to guide the selection of related books. Finally, 12 new frequently cited journals reviewed to determine their suitability as additions to the collection.

Soehner and et. al. (1992), while assessing collection he suggested that citation method is a new collection assessment method based on the citations for articles. The citation record is developed by identifying sources which cite the landmark article. Citation extracted from the articles and used for the purpose of assessment of the collection. This method was used to assess the biotechnology collection of the National Library of Medicine. The information gained from this study, in addition to demonstrating the technique, also provided insight into the evolution of the biotechnology literature. Chen (1977), conducted a systematic study in 1976 covering all the articles published in "Bulletin of the Medical Library Association". The preliminary results were presented at the poster session at the Seventy-fifth Annual Meeting of the Medical Library Association in Minneapolis, and the detailed results and discussion of methodology had been presented as Part I of the author's recent sourcebook on Health Sciences Librarianship, published by Scarecrow Press.

Fang (1989), while ranking journals using citation analysis in his study to identify ranking of journals in health sciences and ascertain the faculty status. Author pointed out that guideline could indicate a journal's value for promotion and tenure consideration. For this purpose author lists recent research articles (1982-1986) published in health science librarianship, and articles written by health sciences librarians, and there were compiled by searching social SCISEARCH and MEDLINE. Results of study shows BMLA as the most prominent journal in the field. Therefore, citations from articles in BMLA from 1982 to 1986 were chosen as a sample for citation analysis. Citation analysis was employed to identify most frequently cited journals. Some characteristics of the citations in BMLA are also discussed. The ranking of journals based on citation frequency, as a result, was also identified.

Mulla (2011), in his citation study which is based on 1808 citations from 101 research articles published in 7 volumes (14 issues) of "International Journal of Information Science and Management (IJISM)" published during 2003 to 2009, indicated that 190 authors have contributed in 101 articles. majority of the articles were published in 2007, and 32 (16.84%)

authors had contributed 14 articles, (49.47%) authors contributed with two-authored papers and authors' collaboration was found to be 0.80. The average number of authors per volume was 27.14. IJISM contained 1808 references out of which 1573 are print-citations and 235 are electronic-citations from 101 articles. Every issue has approximately 14.43 articles and each article had an average 12.43% print references and 1.86% electronic citations. It was noted that authors had preferred print information services and journals were the most preferred sources among the print and electronic references as compared to books, proceedings, theses and other sources. The country wise distributions of articles covered 17 countries. Out of total 190 authors, highest numbers i.e., 157 have been contributed from Iran, and stands in the first rank among the contributors. UK and Germany stand in the second and third place respectively, followed by India, Nigeria, China, Bangladesh and Malaysia these are in the fourth place with a contribution of two articles each. Similarly, 9 countries together in the fifth rank with a contribution of one article each.

Hadagali et al (2009), in their paper attempted to identify the attributes of subject literature in Physics theses submitted to Karnataka University, Dharwad during 1992–2006. Their study is based on 10,057 citations (references) reflected in the 37 theses. Subject distribution, form wise distribution, authorship pattern, chronological distribution of journals and books, half-life period of journals are examined. Journal of Chemical Physics ranked first among 548 journals. Tiew (2000), Analyzed the use of self-citation and author self-citation in the research articles and short communications published in "Natural Rubber Research" during 1988 to 1997. Results showed that 53% of articles contained self-citations; the rate of journal self-citations per article ranges between 1 to 12; a high percentage of authors (61.4%) contributing articles to the journal cited themselves is a tendency noticed for authors affiliated to the institution publishing the journal to cite the journal; the highest self-citing author is A. D. Roberts in this study.

LaBonte (2005), in his citation analysis used literature from Science-Engineering Library at the University of California, Santa Barbara and find out meeting the needs of an interdisciplinary group of 60 faculty members at California Nano Systems Institute. The latest three publications of each faculty member (published within the last two years) were analyzed in two ways using the Science Citation Index to find articles they published in journals and the journals cited in articles. The results indicate that the library subscribes to 98 percent of the journals in which faculty members are published or are citing frequently. This information is useful to map the citation patterns of a new interdisciplinary field and can be

used for future collection management decisions. Zafrunnisha and Reddy (2011), this paper studied the citation analysis from PhD theses of Psychology subject and these were submitted to Sri Venkateswara University, Tirupati, and Andhra Pradesh, India during the period 1963 – 2003. Out of 9275 citations from 56 PhD theses, from Journals contribute the highest number of citations accounting for 63.7%, multi authored papers account for 63.32%. Journal of Applied Psychology' occupies the first rank with 4.26% citations, USA ranked first by citing 34.92% journals. Most of the cited journals of Psychology (94.6%) are in English language and maximum citations (47.62%) are from Psychology only.

Griscom (1983), made an effort to measure in-house use of music periodicals using citation study based on bibliographies in theses and dissertations studding was conducted at the Indiana University Music Library. A total of 256 titles were cited, but only 30% were cited more than once. While the periodical literature cited by musicologists has a low rate of obsolescence, the periodicals cited by theorists and educators becomes obsolete at a rapid rate, making the rate of obsolescence for the field as a whole, fairly high, unlike other subject areas in the humanities.

Nabe and Imre (2008), analyzed citation analysis of PhD dissertations in plant biology and zoology at Southern Illinois University Carbondale, and tested the common assumption that scientists favour of current research to such an extent that journal backfiles can be de-emphasized in academic library collections. The study is reproducible for any institution, and helpful to evaluate to find the value of electronic journal backfiles and the need to maintain print backfiles. Miller (2011), conducted a study on content analysis from literature published during 2000-2010, that focused on university biology students, faculty, Scholarly articles were divided into the library research domains. The largest number of papers published was from the Education domain, followed closely by Collections. Only two papers were categorized as Reference/Enquiries, and no papers were found in Management and Professional Issues. This study helps to science librarians to better understand what has already been written about biology subjects in a university setting. Gaps in the research can help other librarians who are interested in pursuing more research with biology subjects. Wu Jun (2009), In their paper, the citation data (2006—2007) from Journal Of Fishery Sciences Of China (JFSC) is analyzed according to the information provided by Chinese St Journal Citation Reports 2006—2007. The results showed that the number of citing journals to JFSC were 141 and 166 in 2006 and 2007, respectively. The total cited frequency of 2006 and 2007 was 2133 times, which was more than that of 2004 and 2005 by 991 times. The highest citing



frequency to a single paper was 22 times, and among the top 10 highest cited papers, those about fish disease, immunology and genetics dominated. The conclusion is that the citation analysis provides a direction for the editors to organize the articles for their journals according to the change of hot-topic research from the cited data and researchers also could get some suggestions from the results. Wole and Olayinka (2009), analyzed citations from master's degree dissertations submitted to the Department of Animal science, University of Ibadan, Nigeria during the period 2000-2007, for finding possible relationships between citing, cited articles and authors. Frequency and percentage distributions (presented in charts, tables, and graphs) and measures of central tendency were used to analyse data. Findings showed that journals were the most utilized reference materials in the dissertations. The areas like poultry nutrition works had the highest number of dissertations followed by agricultural biochemistry and nutrition. The lowest number of dissertations was from forage production and management and monogastric nutrition with just two dissertations each. The findings from this study could serve as a user study with implications for both collection development and user services design in libraries. Future studies could focus on ascertaining the implications of collection of reference materials to project and article referencing, instruction in classes and outreach.

Haddow (2010), in their study citation analyses from Australian social science journals to determine the differences between data drawn from Web of Science and Scopus. In addition, citation-based indicators including an extended journal impact factor, the h-index, and a modified journal diffusion factor, were calculated to assess whether subsequent analyses influence the ranking of journals. The findings suggests that the Scopus database provides higher number of citations for journals. However, there appears to be very little association between the assigned tier ranking of journals and their rank derived from citations data.

Anil Kumar and Dora (2011), in their study analyzed the citations of the 49 doctoral dissertations submitted to Indian Institute of Management, Ahemadabad, during the period 2004 to 2009. The study revealed that journals are the most cited sources, and based on the pattern of citations, a local ranking list of journals has been developed. Author also applied Bradford's law to identify the groups of journals differentiated by their use. Results indicated that the top 48 journals that were ranked among the 30 most used journals contributed to more than 55% of the journal citations.

Hadagali et. al. (2009), In their paper made an attempt to identify the attributes of subject literature in Physics as reflected in theses submitted to Karnataka University, Dharwad during 1992-2006. The study is based on the 10, 057 citations given in the references in the 37 theses. Subject wise distribution, form wise distribution, authorship pattern, chronological distribution of journals and books, half life period of journals are also examined. Journal of Chemical Physics ranked first among 548 journals. It is found from the study that Half life period of journals is 33 years. Pali and Moore (2008), in their article reports the findings of a study conducted to examine the types of information used by graduate students in the fields of biological and agricultural sciences at Iowa State University (ISU). The citations of doctoral dissertations submitted in nine agriculture and biological science subject fields at ISU from 1997–2006 were analyzed. The article discusses the types and ages of resources cited in the different subject fields studied. The most cited journals in each discipline were identified, and the journal title dispersion was examined. Neshaneh (2009), In his research study examined the sources of " sciences and petroleum engineering" between the years of 1980 and 1986 .for finding core journals and analyzing the writer's citation behaviours according to the types , languages of the recourses used. In his study analyzed 115 essays in 17 quarterlies. The research shows that, the most number of citations is related to journals. Represents 491 cases of the total number of 1154 resources, which is equal to 42.5%. From the total number of citations to journals, 95.9% was related to Latin journals and 4.1% related to Persian ones. Books have 453 cases and 37.5% of the whole citations are categorized at second level. From the citations to the books 91% books and 8.3% for Persian ones. Citations to reports, standards, patents and conferences with 14.7% are at third level.

Eckel (2009), studied the citation patterns in 96 Master's theses and 24 PhD dissertations completed at Western Michigan University's College of Engineering and Applied Sciences between 2002 and 2006. The hypothesis of this study was that an increase in graduate student research competence between the master's and doctoral levels could be seen in their use of scholarly sources such as journal articles and conference papers. From each thesis and dissertation, bibliographic information. The data analysis indicated that doctoral engineering students use a significantly greater number of scholarly journal articles (44.3% to 29.3%) and conference papers (21.9% to 12.5%) than master's students. Also, master's students depend more heavily upon literature available on the web. These results gave tentative support to the hypothesis. This study shows that there is a significant difference in the proportions of scholarly and other research sources used by master's and doctoral engineering students.

Javed and Shah (2008), analyzed the citation pattern adopted by researchers for publishing in Rawal Medical Journal (RMJ) in 2006. Author collected citations of articles published in the RMJ and analyzed manually in the study. From 437 citations in 32 research articles. The authorship pattern of the citations indicated that more than 23 % contributions were from single author and 77 % were the result of team work. The ratio of the coordinated work among the citations, 49.52 % pertained to journal articles. From the cited articles, 23 articles were contributed by the Pakistani authors, 8 by foreign authors and 1 jointly by Pakistani with foreign author. (Rawal Med J 2008; 33:254-257).

Sahu et. al. (2011), while studying citation pattern reported in his study, publication growth, its characteristics, research impact, quality, citation value, category of journals, core research areas, characteristics of productive authors with reference to the National Metallurgical Laboratory, an R&D organization under CSIR, India after analyzing data. Based on data collected from Science Citation Index, it was found that the highest number of 120 papers were published by the laboratory in the year 2010, out of which 28 papers received 62 citations during the same year for the papers published by the laboratory whereas the highest citation received were 738 from 88 out of 107 papers published in 2006. The average number of publications per year was 88.1 for the period under consideration and the average citation per paper was 5.02. The analysis shows that the majority of the authors of this laboratory published their research work in joint authorship (96.48%). The authors mostly prefer to publish their research findings in reputed international journals rather than Indian journals. 72.95 percent citing authors are from foreign countries and only 27.05 percent are Indians. Therefore, the R&D contributions made by scientists of CSIR-NML had a global impact in the field of metallurgy and materials science. High citations received were in the areas of materials science, metallurgical engineering, Nano science & Nano technology and environmental engineering over the last decades as observed during the period 2001-2010. The h-index of the last decade was 25.

**Summary:** - The purpose of this research study was to analyze the current information needs, trends in research and use of literature by LIS Researchers.

### **References:-**

- Arvinda P and Reddy Pulla V (1990), "Citation analysis of socio cultural anthropology literature." Lucknow Librarian, Vol. 22, p. 51-57.

- Angela M. Gooden (2001) Citation Analysis of Chemistry Doctoral Dissertations: An Ohio State University Case Study, *Science and Technology Librarianship*. Located at <http://www.library.ucsb.edu/istl/01-fall/refereed.html> accessed on 24-04-2011.
- Akiko Kubota (1976), A citation analysis of graduation theses of the School of Library and Information Science, Keio University. [In Japanese.] *Library and Information Science*, Issue: 14, p.193-209 Located at <http://www.mendeley.com/research/citation-analysis-graduation-theses-school-library-information-science-keio-university-japanese/> accessed on 17-12-2011.
- Anil Kumar H and Dora Mallikarjun (2011), Citation analysis of doctoral dissertations at IIMA: A review of the local use of journals, *Library Collections, Acquisitions, and Technical Services*, Volume 35, Issue 1, spring, p.32. , doi:10.1016/j.lcats.2011.03.002 accessed at <http://www.sciencedirect.com/science/article/pii/S1464905511000108> accessed on 23-10-2011.
- Azadeh F, Vaez R and Gharib M (2009), A Survey of accuracy of cited articles based theses of Medical Specialties Students in Tehran University of Medical Sciences, *Payavard Salamat*, Vol. 3(2-1) : p.7 Located at [http://journals.tums.ac.ir/abs.aspx?org\\_id=59&culture\\_var=en&journal\\_id=21&issue\\_id=1937&manuscript\\_id=16717&segment=fa](http://journals.tums.ac.ir/abs.aspx?org_id=59&culture_var=en&journal_id=21&issue_id=1937&manuscript_id=16717&segment=fa) accessed on 03-05-2011.
- Beena S (1996), "Book publishing in Malayalam: A bibliometric approach." *Library science with a slant to documentation*, Vol. 33, p.191-199.
- Biglu, Mohammad Hussein, (2005), The Impact Factor and self citation trend of German journals indexed in the JCR, Located at <http://eprints.rctic.org/bitstream/10760/10231/1/factor-german.pdf>. Accessed on 15-07-2011.
- Bill Johnson (1996), Citation Analysis of the Texas Tech University's Statistics Faculty: A Study Applied to Collection Development at the University Library, *LIBRES: Library and Information Science Research Electronic Journal* ISSN 1058-6768 Volume 6 Issue 3; September Quarterly LIBRE6N3, Accessed at <http://libres.curtin.edu.ac/libre6n3/johnson.htm> accessed on 12-10-2011.
- Bill Johnson (2000), Environmental Impact: A Preliminary Citation Analysis of Local Faculty in a New Academic Program in Environmental and Human Health Applied to Collection Development in an Academic Library (LIBRES.) *Library Philosophy and Practice* Vol. 2, No. 2 (spring) Located at

<http://www.uidaho.edu/~mbolin/lppv2n2.htm> and  
<http://www.curtin.edu.au/curtin/dept/sils/libres/libre9n1/toxcite.htm> accessed on  
24-12-2011.

- Boell, S.K. (2007), A Scientometrics Method to Analyze Scientific Journals as Exemplified by the Area of Information Science, (Unpublished Thesis]. E-LIS. E-prints in Library and Information Science Accessed at [http://eprints.rclis.org/bitstream/10760/3949/1/Boell,\\_Sebastian\\_K-2007-Master\\_Thesis-body.pdf](http://eprints.rclis.org/bitstream/10760/3949/1/Boell,_Sebastian_K-2007-Master_Thesis-body.pdf) accessed on 03-09-2010.
- Brennen, Patrick W (1978), Citation Analysis in the Literature of Tropical Medicine, Bull. Med. Libr. Assoc. 66 (1) January, Located at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC225294/pdf/mlab00085-0048.pdf> accessed on 24-09-2010.
- Casserly Marry F and Bird James E (2003), Web citation availability: Analysis and implications for the scholarship, College and research libraries, Vol. 64(4)
- Chandrasekharan, M and Ramasesh, C.P (2009).Library and Information Science Research in India. Asia Pacific Conference, on Library and Information Education and practice. Located at <http://www.slis.tsukuba.ac.jp/~atsushi/aliep/proceedings/Papers/a65.pdf> accessed on 27-5-11.
- Chang-Ping Hu , Ji-Ming Hu , Yan Gao and Yao-Kun Zhangjournal (2011) , J A journal co-citation analysis of library and information science in China, Scientometrics 86, p.657, accessed at <http://portal.acm.org/citation.cfm?id=1938394> accessed on 27-04-2011.
- Chaurasia Kamal Kumar (2008), Bibliometric Analysis Of Annals Of Library And Information Studies (2002-2006), MANLIBNET 9th Annual National Convention, New Delhi (India),4-6 February E-LIS. E-prints in Library and Information Science. Located at <http://eprints.rclis.org/handle/10760/11756> accessed on 27-08-2011.
- Chen Ching-Chih (1977), A Citation Analysis of the Bulletin of the Medical Library Association, Bull. Med. Libr. Assoc. 65(2) April , p.290, Located at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC199339/pdf/mlab00130-0123.pdf> accessed on 13.12.2011.
- Chia Lo Szu (2007), Use of Information Resources in Writing up Dissertation: A Citation Analysis, International Conference on Engineering Education – ICEE, September 3 – 7, Coimbra, Portugal. Accessed at

<http://www.ineer.org/Events/ICEE2007/papers/257.pdf> and  
<http://www.mendeley.com/research/cocitation-analysis-research-method-library-information-science/> accessed on 15.05.2011.

- Chikate R V and Dr. Patil S K (2008) Citation Analysis of Theses in Library and Information Science Submitted to University of Pune: A Pilot Study, Library Philosophy and Practice 2008 accessed at <http://webpages.uidaho.edu/~mbolin/chikate-patil> accessed on 22.09.2011.
- Consuella A. Askew (2008), an examination of Lotka's law in the field of library and information studies, Florida International University, Miami, Florida (Ph. D Thesis). Located at <http://digitalcommons.fiu.edu/cgi/viewcontent.cgi?article=1235&context=etd&sei-redir=1#search=%22An%20Examination%20Lotka%20C3%A2%20C2%80%20C2%99s%20law%20Field%20Library%20Information%20Studies%22> accessed on 09.12.2011.
- Dalia Cohen (1987), "A bibliometric method for the evolution and design of research funding policies". Dissertation Abstracts, DAI 47/08, p.264A. (Case Western Reserve University)
- Das Anup Kumar and Sen B K (2001), Journal of Biosciences – An Analysis of Citation Pattern Annals of Library and Information Studies 48, 2; p. 59
- Datta Bidyarthi and Sen B K (2000), Indian journal of pure and applied physics- An analysis of citation pattern, ILA Bulletin, Vol. 44(12)
- Datta, B and Kumar, Anup and Sen B. K (2001), Variations in journal self citation: A pattern, ILA Bulletin, Vol. 37 (1).
- Denick, D (2010), Citation Analysis of Engineering Design Reports for Information Literacy Assessment Located at [http://idea.library.drexel.edu/bitstream/1860/3475/1/Denick\\_Bhatt\\_Layton.pdf](http://idea.library.drexel.edu/bitstream/1860/3475/1/Denick_Bhatt_Layton.pdf) accessed on 14.10.2011.
- Dervos Dimitris A., Samaras Nikolaos, Evangelidis Georgios and Foliass Theodore (2006), A New Framework for the Citation Indexing Paradigm, In 69th Annual Meeting of the American Society for Information Science and Technology (ASIST), Austin (US), 3-8 November .Richard B. Hill. (Published) [Conference Paper] E-LIS. E-prints in Library and Information Science. Located at <http://eprints.rclis.org/handle/10760/8787> accessed on 14.02.2012.

- Deshpande Meera and Rajyalakshmi D (1997), Citation study of dissertations in Library and Information science, *Annals of Library Science and Documentation*, Vol. 44(12)
- De Groote Sandra (2008), Citation patterns of online and print journals in the digital age, *J Medical Library Association*. October; 96(4): p.362. Located at [http://www.experts.scival.com/uic/pubDetail.asp?t=pm&id=18974814&o\\_id=167](http://www.experts.scival.com/uic/pubDetail.asp?t=pm&id=18974814&o_id=167) accessed on 16.12.2011.
- Diluvio C Y (1990), "Science in the Philippines: A bibliographic and bibliometric analysis of the periodical literature." *Dissertation abstracts*, DAI 50/07, p.166 A (University of Illinois at Urbana-Champaign).
- Duzyol Guleda, Taskin Zehra and Tonta Yasar (2010), Mapping the Intellectual Structure of the Open Access Field through Co-citation Analysis, Located at E-LIS. *E-prints in Library and Information Science*, and <http://eprints.rclis.org/handle/10760/14910> accessed on 17.12.2011.
- Eckel Edward J. (2009), *The Emerging Engineering Scholar: A Citation Analysis of Theses and Dissertations at Western Michigan University*, *Science and Technology Librarianship*, winter, Located at <http://www.istl.org/09-winter/refereed.html> accessed on 17.12.2011.
- Fang, M L (1989), Journal rankings by citation analysis in health sciences librarianship. *Bull Medical Library Association*. April; 77(2), p.205–211. Accessed at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC227369/> accessed on 17.12.2011
- Fuchs Beth E, Cristina M. Thomsen, Randolph G. Bias, and Donald G. Davis Jr.(2006), Behavioral Citation Analysis: Toward Collection Enhancement for Users , *College & Research Libraries*, July vol. 67 no. 4, p.304-324 Located at <http://crl.acrl.org/content/67/4/304.abstract> accessed on 17.12.2011
- Garg Ram Gopal, Tamrakar Rajnish and Tamrakar Amit (2009), *Doctoral Research on Academic Libraries and Allied Fields in Indian Universities : A Bibliometric Study*, *Proceeding of International Conference on Academic Libraries October 2009*, at University of Delhi, New Delhi, p.193. Accessed at [http://crl.du.ac.in/ical09/papers/index\\_files/ical-32\\_134\\_295\\_1\\_RV.pdf](http://crl.du.ac.in/ical09/papers/index_files/ical-32_134_295_1_RV.pdf) accessed on 17.12.2011.

- Ghosh Saptarshi (2000), Citation pattern of contributions in library science with a slant to documentation and information studies, SRELS Journal of Information Management, Vol. 37(4)
- Griscom Richard (1983), Periodical Use in a University Music Library: A Citation Study of Theses and Dissertations Submitted to the Indiana University School of Music from 1975-1980, The Serials Librarian, Vol. 7(3), Spring. Located at [http://repository.upenn.edu/cgi/viewcontent.cgi?article=1068&context=library\\_papers&seiredir=1#search=%22Periodical%20Use%20University%20Music%20Library%3A%20Citation%20Study%20Theses%20Dissertations%20Submitted%20Indiana%20University%20School%20Music%20from%201975-1980%22](http://repository.upenn.edu/cgi/viewcontent.cgi?article=1068&context=library_papers&seiredir=1#search=%22Periodical%20Use%20University%20Music%20Library%3A%20Citation%20Study%20Theses%20Dissertations%20Submitted%20Indiana%20University%20School%20Music%20from%201975-1980%22) accessed on 23.03.2011.
- Hadagali Gururaj S, Kumbar B D and Benahal Amrut (2009), Citation Analysis of Ph D Thesis submitted to Karnataka University, Dharwad in the field of Physics, Information Studies, Vol. 15, Issue 2. Located at <http://www.indianjournals.com/ijor.aspx?target=ijor:is&volume=15&issue=2&article=005> accessed on 25.05.2011.
- Haddow Gaby and Genoni Paul (2010) Citation analysis and peer ranking of Australian social science journals , Scientometrics Volume 85 Issue 2, November. Located at <http://www.springerlink.com/content/32753r57x48023p6/> accessed on 30.05.2011.
- Ijari S R and Kannappanavar (1990), “Information usage patterns of Indian clinical psychologist: A citation study.” Journal of library and information science, Vol. 16, p.170-183.
- Jadhav Vandana S, Khaparde Vaishali S and Shelke Santosh M (2011), Citation Analysis of University News Journal, 8th International CALIBER - 2011, Goa University, Goa, March 02-04, © INFLIBNET Centre, Ahmadabad accessed at <http://shodhganga.inflibnet.ac.in/dxml/handle/1944/1655> accessed on 17.12.2011
- Jan Rosy (2009), Citation Analysis of Library Trends , Webology, Volume 6, Number 1, March, Located at <http://www.webology.org/2009/v6n1/a67.html> accessed on 27.09.2011.
- Janakiramaiah M and Doraswamy M (2011), Measuring Impact Of Web Resources In Conference Proceedings: A Citation Analysis, 8th International CALIBER - 2011,



Goa University, Goa, March 02-04, INFLIBNET Centre, Ahmadabad. Located at <http://shodhganga.inflibnet.ac.in/dxml/handle/1944/1645> accessed on 03.12.2011.

- Javed Muhammad and Shah Syed Shoaib (2008), Rawal Medical Journal – An Analysis of Citation Pattern, The Journal of the Pakistan Medical Association, Vol. 33, Number 2, July- Dec. *Rawalpindi - Islamabad* . Located at [http://www.rmj.org.pk/ram\\_july\\_dec\\_08/sounding\\_board/full\\_article.html](http://www.rmj.org.pk/ram_july_dec_08/sounding_board/full_article.html) accessed on 03.12.2011
- Jonathan Nabe and Andrea Imre (2008), Dissertation Citations in Organismal Biology at Southern Illinois University at Carbondale: Implications for Collection Development, Science and Technology Librarianship, Fall. <http://www.istl.org/08-fall/refereed.html>
- Kabir S Humayoon (1994), “Authorship trend and solo research in bibliometrics: A bibliometric study.” *Library science with a slant to documentation*, Vol. 31, p.87-90.
- Kannappanavar B U, Savadatti S G and Nulvi C N (1991), “Obsolescence of literature in clinical psychology” *Lucknow Librarian* , Vol. 23, p. 84-94.
- Kannappanavar B U and Vijay Kumar M (2000), Fifty years of LIS research in India: Trends and developments, *SERLS journal of information management*, Vol. 37 (4), p. 267-300.
- Karisiddappa C R, Maheshwarappa B S and Shirol M V (1990), “Authorship pattern and collaborative research in Psychology.” *IASLIC Bulletin*, Vol. 35, p. 73-78.
- Kayongo Jessica (2011), *Relevance of Library Collections for Graduate Student Research: A Citation Analysis Study of Doctoral Dissertations at Notre Dame, College and Research Libraries Pre-Print*, Located at <http://crl.acrl.org/content/early/2011/03/28/crl-211.full.pdf> Accessed on 14.08.2011
- Keat Yeap Chun and Kiran Kaur (2008), Citation Study Of Library And Information Science Dissertations For Collection Development, *Malaysian Journal of Library & Information Science*, Vol.13, no.2, Dec, p.29-47. Accessed at <http://majlis.fsktm.um.edu.my/document.aspx?FileName=658.pdf> Accessed on 14.08.2011.
- Kousha, Kayvan and Thelwall Mike (2007), Google Scholar Citations and Google Web/URL Citations: A Multi-Discipline Exploratory Analysis, *Journal of the American Society for Information Science and Technology*, Volume: 58, Issue: 7, Publisher: John Wiley & Sons, Inc., p.1055-1065. Accessed at

<http://www.mendeley.com/research/google-scholar-citations-and-google-weburl-citations-a-multidiscipline-exploratory-analysis/> Accessed on 23.12.2011

- Kubota Akiko (1976), A citation analysis of graduation theses of the School of Library and Information Science, Keio University. [In Japanese.] *Library and Information Science* (1976) vol.14, p.193-209. Located at <http://www.mendeley.com/research/citation-analysis-graduation-theses-school-library-information-science-keio-university-japanese/> Accessed on 23.12.2011
- Kumar P S G (1998), Doctoral Studies in Library and Information Science in India: A Study, *DESIDOC Bulletin of Information Technology*, Vol. 18, No. 1, January 1998, p.5-9. Located at <http://publications.drdo.gov.in/gsd/collect/dbit/index/assoc/HASH719f.dir/dbit1801005.pdf> Accessed on 23.12.2011
- Kumar Surendra and Kumar S (2011), Citation Analysis of Journal of Oilseed Research, 8th International CALIBER - 2011, Goa University, Goa, March 02-04, Located at <http://shodhganga.inflibnet.ac.in/dxml/bitstream/handle/1944/1643/51.pdf?sequence=1> Accessed on 05.06.2011
- LaBonte Kristen B. (2005), Citation Analysis: A Method for Collection Development for a Rapidly Developing Field, *Science and Technology Librarianship Summer*, Accessed at <http://www.istl.org/05-summer/refereed.html> Accessed on 05.06.2011.
- Lal Arjun (1993), "Most important journals from the point of view of Indian soil scientists: A bibliometric study." *IASLIC Bulletin*, Vol. 38, p. 123-131.
- Mahapatra Gayatri (1992), "Post Ranganathan Era: A bibliometric analysis of Ranganathan's contributions." *IASLIC Bulletin*, Vol. 37, p. 177-182.
- Mahapatra Gayatri (1995), "bibliometric analysis of the highly cited Indian library and information science journals." *Herald of library science*, Vol. 34, p. 27-34.
- Martens Betsy Van der Veer (2001), Do citation systems represent theories of truth?, *Information Research*, Vol.6, No. 2, January , Located at <http://informationr.net/ir/6-2/paper92.html> Accessed on 05.06.2011
- Meadows A J (2004), The citation characteristics of astronomical research literature, *Journal of Documentation*, Vol. 60(6).
- Meho, Lokman I. and Sonnenwald, Diane H.(2000), Citation Ranking Versus Peer Evaluation of Senior Faculty Research Performance: A Case Study of Kurdish Scholarship, *JOURNAL OF THE AMERICAN SOCIETY FOR INFORMATION*

SCIENCE. 51(2), p.123. Located at

<http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.85.8879> Accessed on 05.06.2011

- Meho, Lokman I and Rogers Yvonne (2008), Citation Counting, Citation Ranking, and *h*-Index of Human-Computer Interaction Researchers: A Comparison between Scopus and Web of Science, *Journal of the American Society for Information Science and Technology*, 59(11), p.1711-1726. Accessed at <http://sci2s.ugr.es/hindex/pdf/MehoRogers2008.pdf> accessed on 24.02.2012.
- Meho Lokman I and Yang Kidul (2006), A New Era in Citation and Bibliometric Analyses: Web of Science, Scopus, and Google Scholar, *Journal of the American Society for Information Science and Technology*, Volume: in press, p.49. Located at <http://arxiv.org/ftp/cs/papers/0612/0612132.pdf> and <http://www.mendeley.com/research/a-new-era-in-citation-and-bibliometric-analyses-web-of-science-scopus-and-google-scholar> accessed on 28.06.2011.
- Miller, Laura Newton (2011), Local Citation Analysis of Graduate Biology Theses: Collection Development Implications, *Science and Technology Librarianship*, winter, Located at <http://www.istl.org/11-winter/refereed3.html> accessed on 30.12.2011.
- Miller Laura Newton (2011), University Biology Patrons in the Library Literature 2000-2010: A Content Analysis & Literature Review, *the Canadian Journal of Library and Information Practice and Research*, Vol 6, No (1). Accessed at <http://journal.lib.uoguelph.ca/index.php/perj/article/viewArticle/1400/2055> accessed on 10.02.2012.
- Moradi Shima, Asnafi Amir Reza and Ahwaz-Iran (2006), A glance to Iranian Librarianship blogs: a survey using webometrics method Located at [http://eprints.rclis.org/bitstream/10760/8290/1/A\\_glance\\_to\\_Iranian\\_Librarianship\\_blogs.pdf](http://eprints.rclis.org/bitstream/10760/8290/1/A_glance_to_Iranian_Librarianship_blogs.pdf) Accessed on 05.06.2011
- Mulla, K. R. (2011), Mapping of the International Journal of Information Science and Management (2003-2009): A Citation Study, *International Journal of Information Science and Management*, Vol. 9, No. 1 January / June, p.1. Located at [http://www.srlst.com/ijist/Vol9N1/ijism-V9N1\\_files/ijism91-1-17.pdf](http://www.srlst.com/ijist/Vol9N1/ijism-V9N1_files/ijism91-1-17.pdf) accessed on 23.01.2012.

- Nishavathi (2007) Research trends in library and information science: A subjective analysis of doctoral thesis published in India, NACLIN, Nov. 20-23, p.559-568. Accessed at [www.naclin.org/E%20Nishavati ppt](http://www.naclin.org/E%20Nishavati%20ppt). accessed on 24.12.2011.
- Neshaneh Pakdaman (2009), Citation Analysis of Research in Science & Petroleum Engineering Quarterly (1380-86), Epistemology (Librarianship and Information Science and Information Technology), January, p.28. Located at <http://iau-tnb.iau.ofis.ir/default.aspx?articles&member=2744&page=1> accessed on 12.10.2011.
- Noguchi S (1988), Japanese style management: a bibliometric study, Special Libraries. 79, p.314-321.
- Nuria Vallmitjana and Sabate L G (2008), Citation Analysis of Ph.D. Dissertation References as a Tool for Collection Management in an Academic Chemistry Library, Located at <http://www.crl.acrl.org/content/69/1/72.full.pdf> accessed on 21.09.2011.
- Nweke K M C (1989), "Bradford's law and the journal titles cited by research scholars in zoology at the Ibadaa University, Nigeria." IASLIC Bulletin, Vol. 34, p. 97-104.
- O'Connor M A (1979), Florida state University dissemination and use of library science dissertation in the periodicals indexed in the Social science citation index, Dissertation abstracts. 39, p.6381.
- Pali U. Kuruppu and Moore Debra C (2008), Information Use by PhD Students in Agriculture and Biology: A Dissertation Citation Analysis, Libraries and the Academy - Volume 8, Number 4, October, p.387. Located at [http://muse.jhu.edu/login?uri=/journals/portal\\_libraries\\_and\\_the\\_academy/v008/8.4.kuruppu.pdf](http://muse.jhu.edu/login?uri=/journals/portal_libraries_and_the_academy/v008/8.4.kuruppu.pdf) accessed on 27.12.2011.
- Philipp Mayr and Walther Umstatter (2007), Why is a new Journal of Infometrics needed?, Cybermetrics. Accessed at <http://eprints.rclis.org/handle/10760/8847> accessed on 27.02.2012.
- Pillai Sudhier, K G (2009), Application of Bradford's Law of Scattering to the Physics Literature: A Study of Doctoral Theses Citations at the Indian Institute of Science , DESIDOC Journal of Library & Information Technology, Vol. 30, No. 2, March 2010, p.3-14. © 2010, DESIDOC Received on 12 October, Located at <http://publications.drdo.gov.in/gsd/collect/dbit/index/assoc/HASH8a2b.dir/dbit3002003.pdf> accessed on 17.05.2012.

- Pillai Sudhier, K G And Kumar V K (2010), Scientometrics Study of Doctoral Dissertations in Biochemistry in the University of Kerala, India, Library Philosophy and Practice, Located at <http://www.webpages.uidaho.edu/~mbolin/sudhier-dileepkumar.htm> accessed on 16.04.2011.
- Podlubny Igor (2004), A note on comparison of scientific impact expressed by number of citations in different fields of science, *Scientometrics*, Vol.64, no.1, July, 95-99p. Journal ISSN: 0138-9130 (Paper) p.1588-2861 (Online) accessed at <http://arxiv.org/abs/math/0410574> accessed on 02.09.2011.
- Pulla Reddy V. and Sharma S R (1988), “bibliometric study of research publication in Indian environmental Genetic toxicology” *IASLIC Bulletin*, Vol. 33(1), p. 7-14.
- Raman, Sarala and Varghese, M (2011), Use of Information Sources by the Soil Scientists in Kerala: A Case Study of the Citations in the Master’s Degree Theses of the Kerala Agricultural University, 8th International CALIBER - 2011, Goa University, Goa, March 02-04, Located at <http://ir.inflibnet.ac.in/dxml/handle/1944/1649> accessed on 22.08.2011.
- Ramesh, L.S.R.C.V., & Nagaraju, A.V.S.S. (2000), Citation Analysis of the Indian Journal of Information, Library and Society, *Indian Journal of Information, Library and Society*. VI3, N3 -4, July- December, p.171. Located at E-LIS. E-prints in Library and Information Science, and <http://eprints.rclis.org/handle/10760/5913?mode=full> accessed on 23.09.2011.
- Rekha, G and Parameswaran, M (2002), Knowledge organization 1988-1999: A bibliometric analysis, *SRELS Journal of Information management*, Vol. 39(4).
- Reed K L (1995), Citation analysis of faculty publication: beyond Science Citation Index and Social Science Citation Index, *Bull Med Library Association*. October; 83(4), p.503–508. Located at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC226074/> accessed on 12.05.2012.
- Ruimin Ma, Qiangbin Dai, Chaoqun Ni and Xuelu Li (2009), An author co-citation analysis of information science in China with Chinese Google Scholar search engine, 2004–2006, *Scientometrics*, Vol. 81, No. 1, p.33, DOI: 10.1007/s11192-009-2063-x Accessed at <http://www.springerlink.com/content/f2wg100412467351/> accessed on 30.10.2011.
- Sahu, A K. , Goswami, N.G. and Choudhary, B.K. (2011), Research publications of National Metallurgical Laboratory during the year 2001- 2010 - A study on citation

patterns, *Annals of Library and Information Studies (ALIS)* , Vol 58(2), June, p. 151. Located at <http://nopr.niscair.res.in/handle/123456789/12186> accessed on 03.08.2012.

- Saxena S C , Relan Sonia and Murthy S S (1999), Software for ranking Indian scientists based on citations to their publications, *DESIDOC bulletin of information technology*, Vol. 19 (6)
- Schneirder J W and Borland Pia (2004), Introduction to bibliometrics for construction and maintenance of thesauri Methodological consideration, *Journal of Documentation*, Vol. 60(5)
- Scholman Barbara Frick (1990), “Health education as a specialized field of study: A bibliometric analysis of its research literature.” *Dissertation Abstracts*, DAI 28/03, P. 71. (Kent state University)
- Sellen M K (1984), *Bibliometrics in information science. A citation analysis of two academic library journals*, *College Research Libraries*, Volume: 45, Issue: 2, p.129. Located at <http://www.mendeley.com/research/bibliometrics-information-science-citation-analysis-two-academic-library-journals/> accessed on 24.05.2011.
- Sen S K and Chatterjee S K (1990), “An introduction to research in Bibliometrics: Part I; Background and perspective”, *IASLIC Bulletin*, Vol. 35 (3), p. 105-118.
- Sengupta (1988), *Bibliometric research: Growth of biomedical literature*, Vol. 1, Calcutta: SBA pub. , p.46.
- Sharada B A and Devaki L (1990), “Contribution of journal articles by Indian linguists at the international scene.” *Annals of Library science and Documentation*, Vol. 37(1), p.35-52.
- Shi-Jian Gao and Wang-Zhi Yu and Feng-Ping Luo (2009), Citation analysis of PhD thesis at Wuhan University, China, *Library Collection, Acquisitions and Technical Services* Volume 33, Issue 1, Spring 2009, p.8-16 Located at <http://www.sciencedirect.com/science/article/pii/S1464905509000281> accessed on 17.12.2011.
- Soehner C B, Wray S T, and Richards D T (1992), The landmark citation method: analysis of a citation pattern as a collection assessment method, *Bull Med Libr Assoc*. October; 80(4), p.361–366. Accessed at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC225700/pdf/mlab00117-0051.pdf> accessed on 24.09.2011.

- Suryanarayana Y V (2000), Bibliometric analysis of contributions of journal tobacco research, *Annals of Library Science and Documentation*, Vol. 47(3).
- Swanepoel Adriaan (2010), Ph.D., Library and Information Services, Tshwane University of Technology; research fields: library and information science, citation analysis, *US-China Education Review*, October, Vol. 7, No. 10, Serial No. 71. Located at [www.teacher.org.cn/doc/ucedu201010/ucedu20101012.pdf](http://www.teacher.org.cn/doc/ucedu201010/ucedu20101012.pdf). accessed on 09.12.2011.
- Swanepoel Adriaan (2010), Ph.D., Library and Information Services, Tshwane University of Technology; research fields: library and information science, citation analysis, *US-China Education Review*, October, Vol. 7, No. 10, Serial No. 71. Located at [www.teacher.org.cn/doc/ucedu201010/ucedu20101012.pdf](http://www.teacher.org.cn/doc/ucedu201010/ucedu20101012.pdf) accessed on 04.03.2012.
- Taylor Hazel and Dillon Stuart (2008), *The Changing Face of Information Systems Research: A Longitudinal Study of Author Influence*, *Informing Science: the International Journal of an Emerging Trans discipline* Volume 11, Located at <http://inform.nu/Articles/Vol11/ISJv11p107-123Taylor226.pdf> accessed on 28.07.2011.
- Tiew S W (2000), Characteristics of Self-citations in *Journal of Natural Rubber Research 1988- 1997: A Ten-year Bibliometric Study* , *Malaysian Journal of Library & Information Science*, Vol.5, no.1, 95-10, Located at [http://eprints.rclis.org/bitstream/10760/9031/1/characteristics\\_of\\_self\\_citation\\_jnrr\\_july\\_2000.pdf](http://eprints.rclis.org/bitstream/10760/9031/1/characteristics_of_self_citation_jnrr_july_2000.pdf) accessed on 21.05.2011.
- Tilak Hazarika, Sarma Dipak and Gohain Anjan (2010), *Impact of Library Collection towards Doctoral Studies: A Case Study on Citation Analysis of PhD Dissertations in the School of Science & Technology in Tezpur University*, 7th Convention PLANNER - 2010, Tezpur University, Assam February p.18-20. Located at <http://shodhganga.inflibnet.ac.in/dxml/bitstream/handle/1944/972/32.pdf?sequence=1> accessed on 01.12.2011.
- Tim LaBorie and Halperin, Michael (1976), *Citation Patterns in Library Science Dissertations*, *Journal of Education for Librarianship*, 16, 4, p.271-283, Spring. Located at [http://www.eric.ed.gov/ERICWebPortal/search/detailmini.jsp?\\_nfpb=true&\\_ERICExtSearch\\_SearchValue\\_0=EJ143292&ERICExtSearch\\_SearchType\\_0=no&accno=EJ143292](http://www.eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_ERICExtSearch_SearchValue_0=EJ143292&ERICExtSearch_SearchType_0=no&accno=EJ143292) accessed on 29.12.2011.

- Tonta, Yasar and Al, Umut (2006), Scatter and Obsolescence of Journals Cited in Dissertations of Librarianship, In Library & Information Science Research. Elsevier. P.281-296. Located at <http://eprints.rclis.org/handle/10760/9441> [http://hacettepe.academia.edu/Ya%C5%9FarTonta/Papers/197404/Scatter\\_and\\_Obsol](http://hacettepe.academia.edu/Ya%C5%9FarTonta/Papers/197404/Scatter_and_Obsol) [ence\\_ofJournals\\_Cited\\_in\\_Dissertations\\_of\\_Librarianship](http://hacettepe.academia.edu/Ya%C5%9FarTonta/Papers/197404/Scatter_and_Obsol) accessed on 23.05.2011.
- Vaishnav A A and Dharmapurikar R G (1990), “Citation analysis of the Herald of Library science.” Herald of Library science, Vol. 29(3-4), p. 252-260.
- Vij Rajiv (2001), Library and Information Science Abstract on CD-ROM a bibliometric study, ILA bulletin, Vol. 36(1)
- Vallmitjana Núria and Sabate L. G. (2008), Citation Analysis of Ph.D. Dissertation References as a Tool for Collection Management in an Academic Chemistry Library, College & Research Libraries, January. Accessed at <http://crl.acrl.org/content/69/1/72.abstract> accessed on 21.08.2010.
- Wole Michael Olatokun and Olayinka Makinde (2009), Citation analysis of dissertations submitted to the Department of Animal Science, University Of Ibadan, Nigeria, Annals of Library and Information Studies, Vol. 56, June, p.117. Accessed at [http://www.niscair.res.in/sciencecommunication/researchjournals/rejour/annals/annals2k9/alis\\_jun09.asp#117](http://www.niscair.res.in/sciencecommunication/researchjournals/rejour/annals/annals2k9/alis_jun09.asp#117) accessed on 24.12.2011.
- Wu Jun, Kong Weili and Zhang Xiaoqin (2009),Citation analysis of Journal Of Fishery Sciences Of China from 2006 to 2007, Chinese Agricultural Science Bulletin, GateGory Index : S9-5, DOI : CNKI:SUN:ZNTB.O.2009-20-074. Accessed at [http://en.cnki.com.cn/Article\\_en/CJFDTOTAL-ZNTB200920074.htm](http://en.cnki.com.cn/Article_en/CJFDTOTAL-ZNTB200920074.htm) accessed on 28.12.2011.
- Yang Kiduk and Meho, Lokman I. (2006), Citation Analysis: A Comparison of Google Scholar, Scopus, and Web of Science, the American Society for Information Science and Technology, Volume: 43, Issue: 1, p.1. Located at [http://eprints.rclis.org/bitstream/10760/8605/1/Yang\\_citation.pdf](http://eprints.rclis.org/bitstream/10760/8605/1/Yang_citation.pdf), and <http://www.mendeley.com/research/a-phylogenetic-hypothesis-for-passerine-birds-taxonomic-and-biogeographic-implications-of-an-analysis-of-nuclear-dna-sequence-data-1/> accessed on 27.03.2011.
- Zabed Ahmed S. M. and Md. Anisur Rahman (2009), Lotka’s law and authorship distribution in nutrition research of Bangladesh, Annals of Library and Information



Studies, Vol. 56, June 2009, p.95. Accessed at [http://www.niscair.res.in/sciencecommunication/researchjournals/rejour/annals/annals2k9/alis\\_jun09.asp#95](http://www.niscair.res.in/sciencecommunication/researchjournals/rejour/annals/annals2k9/alis_jun09.asp#95) accessed on 27.12.2011.

- Zandian Fatemeh (2009), A Citation Analysis of M.A Thesis in Library and Information Science (LIS) during 2001-2006, Library and Information Research Journal, Vol 8, No 3 (1386) Located at <http://jm.um.ac.ir/index.php/riis/article/view/5724> accessed on 30.06.2011.
- Zhai Zi-Yang, Wu Xiu-Fang, Zhang Yue-Hong (Helen) (2009), SCI citation analysis and impact factor prediction of JZUS-A in 2008, J Zhejiang Univ Sci A 2009 10(1), p.149-150. Located at [http://www.zju.edu.cn/jzus/download/IF\\_pred\\_JZUSA\\_08.pdf](http://www.zju.edu.cn/jzus/download/IF_pred_JZUSA_08.pdf) accessed on 12.10.2011.
- Zafrunnisha N. And Reddy V. Pulla (2011), Citation Analysis of PhD theses in Psychology: A Quantitative Analysis, Journal of Library and Information Science, Volume 5 (1) Accessed at <http://indianjournals.com/ijor.aspx?target=ijor:pjolis&volume=5&issue=1&article=010> accessed on 29.03.2012.
- Zhao Dangzhi (2006), Dispelling the Myths Behind First-author Citation Counts , In 69th Annual Meeting of the American Society for Information Science and Technology (ASIST),Austin (US),3-8 November 2006. Richard B. Hill. (Published) [Conference Paper] Located at E-LIS. E-prints in Library and Information Science, <http://eprints.rclis.org/handle/10760/8607> accessed on 30.12.2011.

## **Chapter 3: Bibliometrics, Citation and Citation Analysis**

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## **Chapter 3: Bibliometrics, Citation and Citation Analysis**

### ***3.1 Introduction:-***

Dr. Ranganathan S. R. (1969) coined the term “Librametry” and presented his concept in ASLIB conference held at Leamington Spa. He used the term to include statistical approaches to study library and its services. However, the practice of using quantitative method to measure information sources were made even before Dr. Ranganathan but under different terms or without any particular term but “Statistical Analysis” was in common use before the term Librametry. Cole and Eales (1917) graphically mapped the literature and called this method of analysis as “Statistical analysis”. Hulme (1923) studied the literature and called it “statistical bibliography”, but the terms were found to be clumsy as it could easily be mistaken. Later the term was coined as bibliometrics by Pritchard (1969). (www.netugc.com)

### ***3.2 Different Terminologies in Use:-***

Many attempts have been made to define the term bibliometrics and its analogous terms since the use of the term ‘statistical bibliography’ by Hulme (1923), and according to him “the purpose of statistical bibliography is to throw light on the process of written communication and the nature and course of development of a discipline (in so far as this is displayed through written communication) by means of counting and analyzing its various facets of written communication”. Raising (1962) (<http://www.saujanyabooks.com>) and Sengupta I, in his article clearly defined the term statistical bibliography as “the assembling and interpretation of statistics relating to books and periodicals to demonstrate historical movements and to determine national and universal research, use of books and journal, and to ascertain in many local situations the general use of books and journals”. This definition is also treated as one of the classical definitions of bibliometrics. According to Sengupta I N The term ‘Bibliometrics’ was first coined by Pritchard (1969) in preference to existing terminology ‘statistical bibliography’ as he felt there is fair likelihood to misinterpret it as Ming-Huang Wang (2009), bibliometrical methods to books and other media of communication”. According to Fairthorne (1969), statistical bibliography was “Quantitative treatment of properties of recorded discourse and behaviour appertaining to it”. British Standard Glossary (1976) of documentation explained the term bibliometrics as “the study of use of documents and patterns of publication in which mathematical and statistical methods

have been applied” which is basically similar to Pritchard’s original definition of bibliometrics. Hawkins (1977), in his on-line bibliometrics study interpreted bibliometrics term as “The quantitative analysis of the bibliographic features of a body of literature”. Nicholas and Ritchie (1978), in their books entitled ‘Literature on Bibliometrics’ opined that bibliometrics provided information about the structure of knowledge and how it is communicated? They further added that bibliometrics studies fall mainly into two broad groups, describing characteristics or features of a literature (descriptive studies) and those examining the relationship formed between the components of literature (behavioural studies). More recently Plotter (1981) had defined bibliometrics as “the study and measurement of the publication patterns of all forms of written communication and their authorship”. Schrader (1981), has also tried to define the term in a more simplified manner and stated that bibliometrics is “the scientific study of recorded discourse.” Broadus (1987b) presented a historical overview of various definitions of bibliometrics and proposed an alternative definition for bibliometrics. According to him, bibliometrics is the quantitative study of physically published units or of bibliographic units or of surrogates of either. More explicitly Sengupta (1990) and Midrar Ullah (2008) defines the term as “organization, classification and quantitative evaluations along with their authorship by mathematical and statistical calculus”. A more elaborate concept of bibliometrics has been recently explained by Egghe (2000), as Suresh L (2005) describe “development and application of mathematical models and techniques to all aspects of communications.” From these definitions it is concluded that statistical bibliography is replaced by bibliometrics and it means study of measurement of the publication patterns of all forms of written communication and their authorship by means of using citation studies

### ***3.3 What is Bibliometrics?***

The term “bibliometrics” was first used by Pritchard (1969) in his article “Statistical Bibliography or Bibliometrics” published in the “Journal of Documentation”. “Biblio” means book and “Metric” means a scale or measure. Bibliometric means application of statistical studies in library and information science. According to Pritchard (1969), bibliometrics is defined as “the application of mathematics and statistical methods to books and other media of communication.” Potter (1981) defines bibliometrics as “the study and measurement of the publication pattern of all forms of written communication and their author”.

In Bibliometrics and Librametry as an area in which studies “information process and information handling in libraries and information centers by quantitatively analyzing the characteristics and behaviour of documents, library staff, and library users.” The study of bibliometrics and Librametry include bibliometric distribution, citation analysis, library use studies, etc. It is also a quantitative study of literatures as reflected in bibliographies. Bibliometrics is the use of quantitative analysis and statistics to describe patterns of publication within a given field or body of literature (Zhenzhong Ma, 2005)

Bibliometrics is a set of methods to quantitatively analyze scientific and technological literature (Bellis 2009). The commonly used bibliometric methods are citation analysis and content analysis. Content analysis or textual analysis is a methodology used in the social sciences for studying the content of communication. Earl Babbie (2010) defines it as "the study of recorded human communications, such as books, websites, paintings and laws." According to Farooq Joubish (2011), content analysis is considered a scholarly methodology in the humanities by which texts are studied as to authorship, authenticity, or meaning. Later subject includes were philology, hermeneutics, and semiotics. Lasswell (1951, p.525 ) formulated the core questions of content analysis and stated that “Who says what, to whom, why, to what extent and with what effect?” Ole Holsti (1969) offers a broad definition of content analysis as "any technique for making inferences by objectively and systematically identifying specified characteristics of messages." Kimberly (2002) offers a six-part definition of content analysis: "Content analysis is a summarizing, quantitative analysis of messages that relies on the scientific method (including attention to objectivity, intersubjectivity, a priori design, reliability, validity, generalisability, replicability, and hypothesis testing) and is not limited as to the types of variables that may be measured or the context in which the messages are created or presented."

Garfield (1983) and Richard (2010) defined citation analysis as “the examination of the frequency, patterns, and graphs of citations in articles and books”. Content analysis uses citations in scholarly works to establish links to other works or other researchers. Citation analysis is one of the most widely used methods of bibliometrics. Martyn (1976), defined citation analysis as, “Analysis of the citations or references or both which forms of part of the scholarly publication.” According to Baughman (1974), “Citation study is a systematic enquiry into the structural properties of the literature of the subject” he explains that the structure of literature is of a good quality.

Kumar Suchetan and et. al. (2012) Bibliometric method is most often used in the field of library and information science; as well it has an equal applicability in other areas also. In fact, in many research fields use of bibliometric methods is carried out to explore the impact of their field, the impact of a set of researchers, or the impact of a particular paper etc. Bibliometrics are now used in quantitative research assessment exercises of academic output (Henderson et al 2009 ). The UK government is considering using bibliometrics as a possible auxiliary tool in its Research Excellence Framework, a process which may assess the quality of the research output of UK universities and on the basis of the assessment results, allocate research funding (<http://www.ref.ac.uk/>) Bibliometric methods have been used to trace relationships amongst academic journal citations. Citation analysis, which involves examining an item's referring documents, is used in searching for materials and analyzing their merit. Citation indices, such as Institute for Scientific Information's Web of Science, allow users to search forward in time from a known article to more recent publications which cite the known item. Today citation analysis tools are easily available to compute various impact measures for scholars based on data from citation indices. These have various applications, from the identification of expert referees to review papers and grant proposals, to providing transparent data in support of academic merit review, tenure, and promotion decisions.

Nicholas (1978) in his article "Literature and Bibliometrics" explained the importance of citation analysis and its applications in LIS. He pointed out that information scientists and librarians use citation analysis to quantitatively assess the core journal titles and watershed publications (less used or border lined publications) in particular disciplines; interrelationships between authors from different institutions and schools of thought; and related data about the academia. Some more pragmatic applications of this information includes the planning of retrospective bibliographies, finding the age of material used in a discipline (Half life) , and comparison between use of recent publications versus older ones, comparing the coverage of secondary services which can help publishers gauge their achievements and competition, and can aid librarians in evaluating "the effectiveness of their stock". There are also some limitations to the value of citation data. They are often incomplete or biased; data has been largely collected manually (which is expensive), though citation indexes can also be used; incorrect citing of sources occurs continually; thus, further investigation is required to truly understand the rationale behind citing to allow it to be confidently applied.

Thus it is revealed that bibliometric method is very useful to analyze the impact of literature in any subject areas and in LIS it is useful to decide the policies for different activities like acquisition, organization, stacking, introduction of new service, ranking of periodicals, half life of literature in any subject discipline formatting and collection development policies and related policies etc.

### **3.4 Laws of Bibliometrics:-**

The three most commonly used laws in bibliometrics are

- 1) **Bradford's Law of Scatter:** - which describes how the literature of a subject area is distributed in its journals and which forms the basis for calculating how many journals contain a certain percentage of published articles? (Tonta Y and Umut Al, 2004)
- 2) **Lotka's Law of Scientific Productivity:** - A formula for measuring / predicting the productivity of scientific researchers. (Zhang W and Yoshiteru N, 2012)
- 3) **Zipf's Law of Word Occurrence:** - which describes the frequency of the appearance of certain words or more specifically, suggests that people are more likely to select and use familiar rather than unfamiliar words. (Zhang W and Yoshiteru N, 2012)

Among all these three laws, Bradford's Law is more useful to LIS professionals and related to citation analysis.

#### **3.4.1 Bradford's Law of Scatter:-**

Bradford (1934), pointed out that if scientific journals are arranged in order of decreasing productivity of articles on a given subject, they may be divided into a nucleus of periodicals more particularly devoted to the subject and several groups and zones containing the same number of articles as the nucleus when the number of periodicals in the nucleus and succeeding zones will be 1: n: n<sup>2</sup>. Bradford's Law states that journals in a single field can be divided into three parts, each containing the same number of articles:

\* A core of journals on the subject, relatively few in number, that produces approximately one-third of all the articles;

\* A second zone, containing the same number of articles as the first, but a greater number of journals, and

\* A third zone, containing the same number of articles as the second, but a still greater number of journals.

The mathematical relationship of the number of journals core to the first zone is a constant  $n$  and to the second zone the relationship is  $n^2$ . Bradford expressed this relationship as  $1 : n : n^2$ . Bradford formulated his law after studying a bibliography of geophysics, covering 326 journals in the field. He discovered that 9 journals contained 429 articles, 59 contained 499 articles, and 258 contained 404 articles. So it took 9 journals to contribute one-third of the articles, 5 times of 9, or 45, to produce the next third, and 5 times 5 times 9, or 225, to produce the last third. Bradford's Law serves as a general guideline to librarians in determining the number of core journals in any given field. Bradford's Law is not statistically accurate, but it is still commonly used as a general rule of thumb.

### ***3.4.2 What is Citation:-***

Citation is a reference to a published or unpublished source (not always the original source). More precisely, a citation is an abbreviated alphanumeric expression (e.g. Newell84) 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 constitutes what is commonly thought of as a citation (whereas bibliographic entries by themselves are not). A prime purpose of a citation is intellectual honesty to attribute prior or unoriginal work and ideas to the correct sources and to allow the reader to determine independently whether the referenced material supports the author's argument in the claimed way.

### ***3.4.3 What is Reference:-***

Reference is derived from Middle English referren, from Middle French r  f  rer, from Latin referre, "to carry back", formed from the prefix re- and ferre, "to bear". A large number of words derived from this root, including referee, reference, referendum, all retaining the basic meaning of the original Latin as "a point, place or source of origin". According to Med Library (2011), A referee is the provider of this source of origin, and a referent is the



possessor of the source of origin, whether it is knowledge, matter or energy. Because of its meaning, the word reference is used in every sphere of human knowledge, adopting shades of meaning particular to the contexts in which it is used. References can take on many forms, including: a thought, a sensory perception that is audible (onomatopoeia), visual (text), olfactory, or tactile, emotional state, relationship with other, space-time coordinate, symbolic or alpha-numeric, a physical object or an energy projection; but, other concrete and abstract contexts 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 reference from some observers, as in cryptography. Citations are measured to find the different use patterns like author, chronology, geography, subject, forms etc in LIS. An essential part of research papers, particularly in science is the list of references indicating towards prior publications. Ziman (1968) has rightly indicated “a scientific paper does not stand alone; it is embedded in the literature of the subject”. Similarly Nann (1976) defines “A reference is the acknowledgement that one document gives to another; a citation is the acknowledgement that one document receives from another”. Malin (1968) says “A citation implies a relationship between a part or the whole of the cited document and a part or the whole of the citing document.” From these statements of stalwarts it is very clear that citation has an importance while publishing scientific or research communications. It is must to cite the author from which data is used. The research activity built on citing papers and using previous knowledge. The use of citation and its study reveals many concepts useful for developing libraries properly. Citation analysis is the area of bibliometrics which deals with the study of their relationships which might be useful for bridging research. Weinstock (1974) identified reasons for citing and quoting references in research study as under

1. Giving homage to pioneers.
2. Giving credit for related works (Homage to Press.)
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 and adding quality and innovation.
8. Substantiating claims. (Fernando A D N 2004) ,
9. Alerting to forthcoming work.
10. Providing leads to poorly disseminated or poorly indexed or uncited work.
11. Authenticating data and classes of fact-physical constants etc.

12. Identifying original publications in which an idea or concept was discussed.
13. Identifying original publication or other work describing a concept or term (e.g. HODGKIN'S Disease Pareto's Law, Friedel-Crafts reaction etc.)
14. Disclaiming work or ideas of others. (Negative Claims)
15. Disputing priority claims of others. (Negative Homage)

Apart from these points references appended in the research study is valid indicator of its significance. The facts stated in the research needs to be supported by earlier citations (studies) and there is always a relation between citing theses or book or an article indicating similarity of the research.

#### ***3.4.4 Importance of Citations:-***

Ziman (1968), Price (1968), Narin (1976), Marin (1968) had opened that citations plays an important role in research. Further they added that scientific paper or scientific research does not go alone, but it is embedded in the subject of literature, as a reference (citation) which is acknowledgement for the use of information by the another author who cites in his writing. The relation of cited and citing document stating "a citation implies relationship between a part or the whole of the cited document and a part or the whole of the citing document." Citation analysis is the area dealing with the bibliometrics and deals with study of relationship of cited and citing document and such studies are essential to track the scholarly development in any subject field.

#### ***3.5 Citation Analysis:-***

(www.netugc.com) When one author cites another author, a relationship is established. Citation analysis uses citations in scholarly works to establish links. Many different links can be ascertained, such as links between authors, between scholarly works, between journals, between fields, or even between countries. Citations both from and to a certain document may be studied. One very common use of citation analysis is to determine the impact of a single author on a given field by counting the number of times the author has been cited by others. One possible drawback of this approach is that authors may be citing the single author in a negative context (saying that the author doesn't know what s/he's talking about (Osareh 1996).

##### ***3.5.1 Co-citation Coupling:-***

Co-citation coupling is a method used to establish a subject similarity between two documents. If papers A and B are both cited by paper C, they may be said to be related to one another, even though they don't directly cite each other. If papers A and B are both cited by many other papers, they have a stronger relationship. The more papers they are cited by, the stronger their relationship is.

### ***3.5.2 Bibliographic Coupling:-***

Bibliographic coupling operates on a similar principle, but in a way it is the mirror image of co-citation coupling. Bibliographic coupling links two papers that cite the same articles, so that if papers A and B both cite paper C, they may be said to be related, even though they don't directly cite each other. The more papers they both cite, the stronger their relationship is.

### ***3.6 Reasons to conduct Bibliometric Studies:-***

Historically bibliometric methods have been used to trace relationships amongst academic journal citations. The bibliometric research uses various methods of citation analysis in order to establish relationships between authors or their work.

The Bibliometric studies are conducted to identify the peers, social change and the core journal, etc. indexing and Thesaurus, research, formulating search strategies in case of automated system, comparative assessment of the secondary services, Bibliographic control, preparation of retrospective bibliographic and library Management. Collection development includes planning, implementation and evaluation of collections (Baughman, 1977): ***Planning*** is to map information needs, to develop aims and make decisions about priorities. Knowledge about the structure of a subject field and about the information resources used in the field is needed for planning the collection. Bibliometric methods such as citation analysis, bibliographic coupling, co-word analysis and co-citation analysis can be used to map the knowledge structure and the use of literature. ***Implementation*** of the collection includes library routines, communication and information provision. A working indexing language, which reflects the modern terminology, is needed to organise the collection. Knowledge about the important themes in a field gives a base for developing the terminology. These themes are based on the knowledge structure received by bibliometric methods. Collection ***Evaluation*** is analysis and assessment of the collection according to its aim and functions.

Different bibliometric methods such as citation analysis, analysis of the scattering of articles to journals and analysis of the obsolescence of literature are used for this purpose.

Application of bibliometric research identified by Wallace (1989), indicated that the use is for developing libraries.

- Improving the bibliographic control of literature.
- Identifying a core literature especially journals.
- Classifying a literature.
- Tracing the spread of ideas and growth of a literature.
- Improving the efficiency of information handling services.
- Predicting publishing trends and needs.
- Describing patterns of book use by patrons.
- Developing and evaluating library collections.

### ***3.7 Strengths of Bibliometrics as a Research Approach:-***

Bibliometric studies are useful and have a quantitative base. The method helps analysis status and strength is in:

- Methods are objective and repeatable
- Results have a wide range of potential practical value
- Does not require human subject interaction
- High reliability in data that are collected unobtrusively, from the published record, and can be easily replicated by others.

#### ***3.7.1 Limitations of bibliometrics as a research approach:-***

Following few limitations of the study are observed by.

Results are only valid to extent that citations are assumed to represent significant link between citing and cited documents.

- Technical issues related to data obtained from citation indexes and bibliographies
- Variations and misspelling of author names, authors with same name, incomplete coverage of non-English publications

### ***3.8 Application of Bradford's Law in Library and Information Science Research:-***

Stephen J. Bensman. (2005), Bradford's law is used to solve problems in journal collection management as well as resource development in any libraries. The basic concept is to conduct Bradford analyses of journals i.e. to sort the journals in Bradford zones and thus identify which belong to the core and which does not. Any Bradford analysis involves three steps

1. Identify many or all items (usually articles) published in this field;
2. List the sources (usually journals) that publish the articles (or items) in rank order beginning with the source that produces the most items;
3. While retaining the order of the sources, divide this list into groups (or zones) so that the number of items produced by each group of sources is about the same.

The "most obvious potentials" of Bradford analyses are:

- Selection/de-selection
- Defining the core
- Collection evaluation
- The law of diminishing returns
- Calculation of cost based on various coverage
- Setting priorities among journals

Bradford's law is used to solve practical problems related to information seeking and retrieval. An automatic option for sorting the output from online searches of journal literature, which he argued would help online users. "Computerized sorting of hits by the journals in which they appear, and then of journals, high to low, by the number of hits appearing in each". Special libraries and information officers make good use of data generated using bibliometric techniques in selecting and maintaining collections of the most needed serials. Bradford's law, Lotka's law, Zipf's law, and citation analysis have contributed to the effective operation of special libraries"

From the various studies it is analysed major thrust areas of research in Library and Information Science are using application of bibliometrics and the reasons are:

1. Identify the quantum and structure literature on a specific subject during a particular period
2. Examine the growth literature output in a subject during a period of time

3. Identify the source and country-wise distribution of research literature in a particular subject
4. Compare and measure the growth rate of literature on a particular subject in various countries
5. Analyze the authorship pattern of literature on a particular subject published from various countries
6. Analyze the degree of single versus multiple author publication and study the trend in authorship pattern
7. Apply Lotka's authorship productivity concepts on the frequency distribution of authorship productivity
8. Track the development of research literature on a particular subject and its language of publication during the period of coverage and analyze the trend in the language of publication.
9. Study the language of the publication in the context of quantum of pages
10. Study the frequency distribution of applications in the context of country-wise breakdown
11. Analyze quantitatively the annual literature output on a specific subject
12. Identify the variety of research publication on a particular subject
13. Analyze the trend among the various types of publication

The recent developments and methods used and developed the techniques:

### ***3.8.1 The impact factor:-***

The impact factor, often abbreviated as IF, is a measure reflecting the average number of citations to articles published in science and social science journals. It is frequently used as a proxy for the relative importance of a journal within its field. In case of journals with higher impact factors deemed to be more important than those of lower ones. The impact factor was devised by Eugene Garfield, the founder of the Institute for Scientific Information (ISI), now part of Thomson Reuters. Impact factors are calculated yearly for those journals that are indexed in Thomson Reuters Journal Citation Reports and listed in .

In a given year, the impact factor of a journal is the average number of citations received per paper published in that journal during the two preceding years. For example, if a journal has an impact factor of 3 in 2008, then its papers published in 2006 and 2007 received 3 citations

each on average in 2008. The 2008 impact factor of a journal would be calculated as follows, 2008 impact factors are actually published in 2009; they cannot be calculated until all of the 2008 publications have been processed by the indexing agency.

$A$  = the number of times articles published in 2006 and 2007 were cited by indexed journals during 2008.

$B$  = the total number of "citable items" published by that journal in 2006 and 2007. ("Citable items" are usually articles, reviews, proceedings, or notes; not editorials or Letters-to-the-Editor.)

2008 impact factor =  $A/B$ .

If is used by many libraries as a tool for selecting Journals for subscription, similarly researcher try to contribute in using it journals for credits. New journals, which are indexed from their first published issue, will receive an impact factor after two years of indexing; in this case, the citations to the year prior to Volume 1, and the number of articles published in the year prior to Volume 1 are known zero values. Journals that are indexed starting with a volume other than the first volume will not get an impact factor until they have been indexed for three years. Annuals and other irregular publications sometimes publish no items in a particular year, affecting the count. The impact factor relates to a specific time period; it is possible to calculate it for any desired period, and the Journal Citation Reports (JCR) also includes a 5-year impact factor. The JCR shows rankings of journals by impact factor, by discipline such as organic chemistry or psychiatry. The terminology used later and becomes popular is Infometrics which covers:

### **3.8.2 The h-index:-**

The h-index is an index that attempts to measure both the productivity and impact of the published work of a scientist or scholar. The index is based on the set of the scientist's most cited papers and the number of citations that they have received in other publications. The index can also be applied to the productivity and impact of a group of scientists, such as a department or university or country. The index was suggested by Jorge E. Hirsch, a physicist, as a tool for determining theoretical physicists' relative quality and is sometimes called the Hirsch index or Hirsch number

The h-index can be manually determined using citation databases or using automatic tools. Subscription-based databases such as Scopus and the Web of Knowledge provide automated calculators. Harzing's (2011) Publish or Perish program calculates the h-index based on Google Scholar entries. In July 2011 Google trialed a tool which allows a limited number of scholars to keep track of their own citations and also produces a h-index and an i10-index (Google Scholar Blog, 2011), the i10 index indicates the number of academic papers an author has written that have at least ten citations from others. It was introduced in July 2011 by Google as part of their work on Google scholar. A search engine dedicated to academic and related papers. Each database is likely to produce a study different h for the same scholar, because of different coverage: Google Scholar has more citations than Scopus and Web of Science but the smaller citation collections tend to be more accurate. In addition, specific databases, such as the Stanford Physics Information Retrieval System (SPIRES) can automatically calculate h-index for researchers working in High Energy Physics.

### ***3.9 Infometrics:-***

Infometrics is the study of quantitative aspects of information. This includes the production, dissemination and use of all forms of information, regardless of its form or origin. As such, infometrics encompasses the fields of

- Scientometrics, which studies quantitative aspects of science;
- Webometrics, which studies quantitative aspects of the World Wide Web;
- Cybermetrics, which is similar to webometrics, but broadens its definition to include electronic resources;
- Bibliometrics, which studies quantitative aspects of *recorded* information. Scientometrics and webometrics are the latest methods.

#### ***3.9.1 Scientometrics:-***

Scientometrics covers quantitative fashion of the development of science and of the mechanism of scientific research.



- Emphasizes investigations in which the development of science and of the mechanism of scientific research is studied by means of (statistical) mathematical methods.
- Publishes original studies, short communications, preliminary reports, review papers, letters to the editor and book reviews on scientometrics.
- Includes the Journal of Research Communication Studies.

Scientometrics is concerned with the quantitative features and characteristics of science and scientific research. Emphasis is placed on investigations in which the development and mechanism of science are studied by statistical mathematical methods. ([www.springer.com](http://www.springer.com)) The journal publishes original studies, short communications, and preliminary reports, and review papers, letters to the editor and book reviews on scientometrics. Due to its fully interdisciplinary character, the journal is indispensable to research workers and research administrators. It provides valuable assistance to librarians and documentalists in central scientific agencies, ministries, research institutes and laboratories. Scientometrics includes the Journal of Research Communication Studies. Consequently its aims and scope cover that of the latter, namely, to bring the results of such investigations together in one place.

Bibliometrics and scientometrics are two closely related approaches to measuring scientific publications and science in general, respectively. In practice, much of the work that falls under this header involves various types of citation analysis, which looks at how scholars cite one another in publications. This data can show quite a bit about networks of scholars and scholarly communication, links between scholars, and the development of areas of knowledge over time.

Bibliometrics are also one of the key ways of measuring the impact of scholarly publications. If an article is published in a journal with a high impact factor, which is determined in part by the number of citations to articles within a particular journal, this raises the publishing profile of the author. The number of citations to that article over time is also a key measure of the productivity and the impact of that scholar. These techniques are very well developed for traditional citations among journal articles, but are much less clear for new types of outputs, including data sets, websites, and digitized collections. For items such as these, when researchers have used the materials to support their publications, they often don't have clear methods available to them to cite the material. Many of the style guides do not have clear guidance for how to cite a database, for instance, or whether to cite a digitized resource in a

way to identify its digital location, or that cites the original item, whether or not the researcher actually consulted it.

### **3.9.2 Webometrics (Cyber metrics):-**

The concept of webometrics is based on bibliometrics, because like the bibliometrics study, one can measure the different quantitative aspect of the web in webometrics study. Secondly it is based on Infometrics. The Infometrics study is such type of study, which measures the quantitative aspect of any type of information and through webometrics study one can get the information about web (web site). That's why the above phrase is used.

The science of webometrics (also Cyber metrics) tries to measure the World Wide Web to get knowledge about the number and types of hyperlinks, structure of the World Wide Web and usage patterns. According to Björneborn and Ingwersen (2004), the definition of webometrics is "the study of the quantitative aspects of the construction and use of information resources, structures and technologies on the Web drawing on bibliometric and Infometrics approaches." The term webometrics was first coined by Almind and Ingwersen (1997). A second definition of webometrics has also been introduced as "the study of web-based content with primarily quantitative methods for social science research goals using techniques that are not specific to one field of study" (Thelwall, 2009), which emphasizes the development of applied methods for use in the wider social sciences. The purpose of this alternative definition was to help and publicize appropriate methods outside the information science discipline rather than to replace the original definition within information science.

Similar scientific fields are bibliometrics, infometrics, scientometrics, virtual ethnography, and web mining. One relatively straightforward measure is the "Web Impact Factor" (WIF) introduced by Ingwersen (1998). The WIF measure may be defined as the number of web pages in a web site receiving links from other web sites, divided by the number of web pages published in the site that are accessible to the crawler. However the use of WIF has been disregarded due to the mathematical artifacts derived from power law distributions of these variables. Other similar indicators using size of the institution instead of number of web pages have been proved more useful. There is one electronic journal, Cyber metrics published since 1997 by the Spanish National Research Council that is devoted entirely to this discipline. Cyber metrics is a branch of knowledge which employs mathematical and statistical techniques of quantity web sites or their components and concepts, measure their

growth, stability, propagation, and use examines the authenticity of content, establish laws governing these factors, studies the efficiency of cyber information services and systems, services and products and assesses the impact of cyber age on society.

### **3.10 Conclusion:-**

Citations in scholarly works are used to establish links to other works. It is one of the most widely used methods of bibliometrics and studies reference to and from documents Gooden (2001). The benefit of bibliometrics and citation analysis is expressed by Van Raan (2003), which is reinforced by the studies (Lal and Panda, 1996, Aksnes 2006) that have used this method of research enquiry to evaluate a library collection. Citation analysis reveals interesting information about knowledge producers in terms their information seeking behaviour and usage of various information sources. It can highlight the familiarity, awareness and usage of knowledge producers regarding the online and print information sources. Citation analysis examines the frequency, patterns and graphs of citations in articles and books (Garfield, 1983). This chapter satisfy the objective set for the study i.e. "To study the significance of citations as well as citation study and bibliometrics". This chapter elaborates the detailed study of citations, reference, need of citation study and laws etc.

### **References:-**

- Aksnes, D.W. (2006), Citation rates and perceptions of scientific contribution. *Journal of the American Society for Information Science and Technology*, 57(2), p.169-185.  
<http://dspaces.uok.edu.in/jspui/bitstream/1/193/1/Citation%20Analysis%20of%20Library%20Trends.htm>
- Bellis, De Nicola (2009). *Bibliometrics and citation analysis: from the Science citation index to Cybermetrics*. Scarecrow Press, p.417. ISBN 0-8108-6713-3. Located at [http://books.google.com/books/about/Bibliometrics\\_and\\_citation\\_analysis.html?id=ma4YjaKyM9cC](http://books.google.com/books/about/Bibliometrics_and_citation_analysis.html?id=ma4YjaKyM9cC) accessed on 23.08.2011. [http://en.wikipedia.org/wiki/Content\\_analysis](http://en.wikipedia.org/wiki/Content_analysis)  
<http://en.wikipedia.org/wiki/Bibliometrics>  
<http://theeconomicrealms.blogspot.com/2013/01/bibliometrics.html>
- Stephen J. Bensman. (2005), "Urquhart and probability: The transition from librarianship to library and information science", *Journal of the American Society for Information Science and Technology*,

[http://en.wikipedia.org/wiki/User:BirgerH/Subject\\_%28discourse%29](http://en.wikipedia.org/wiki/User:BirgerH/Subject_%28discourse%29)

[http://en.wikipedia.org/wiki/Impact\\_factor](http://en.wikipedia.org/wiki/Impact_factor)

[http://www2.inescporto.pt/uitt/RePEc/09.03.19\\_wp3\\_TeixeiraSequeira.pdf](http://www2.inescporto.pt/uitt/RePEc/09.03.19_wp3_TeixeiraSequeira.pdf)

[http://dlist.sir.arizona.edu/2123/01/Bradfords\\_law\\_JDoc.pdf](http://dlist.sir.arizona.edu/2123/01/Bradfords_law_JDoc.pdf)

- Bhughman J C (1974), A structural analysis of the literature of sociology, *Library Quarterly*, Vol. 44 (Oct), p.293-308. Collection Building, Volume 22, Issue 1 (2006-09-19)  
<http://archive.ifla.org/IV/ifla61/61-ungs.htm>
- Birger Hjørland and Jeppe Nicolaisen "Bradford's Law of Scattering: Ambiguities in the Concept of "Subject" Royal School of Library and Information Science, Birketinget 6, DK-2300 Copenhagen S., Denmark {bh, jni}@db.dk <http://www.isko.org/kolit.php?cl=94>
- Bradford, S.C. Sources of information on specific subjects. *Engineering*, 1934, 137 (3550), p.85-86. <http://www.netugc.com/librametric-bibliometric-scientometrics-informetrics>,  
<http://www.abo.fi/~sungern/comm00.htm>  
[http://en.wikipedia.org/wiki/User:BirgerH/Subject\\_%28discourse%29](http://en.wikipedia.org/wiki/User:BirgerH/Subject_%28discourse%29)  
[http://en.wikipedia.org/wiki/Impact\\_factor](http://en.wikipedia.org/wiki/Impact_factor)  
<http://dhsws1.humanities.curtin.edu.au/libres/LIBRES7N1/HADDOW.txt>  
<https://www.ischool.utexas.edu/~palmquis/courses/biblio.html>  
<http://www.netugc.com/librametric-bibliometric-scientometrics-informetrics>
- British Standards Institution. British standards of documentation terms. BSI; London; 1976, p.7. <http://publications.drdo.gov.in/ojs/index.php/djlit/article/viewFile/671/287>
- Broadus R N (1987a), early approaches to bibliometrics, *journal of the American society for information science*, 38, p.127-129.  
<http://www.bitlib.net/t/the+literature+and+informetrics.html>  
[http://dbis.eprints.uni-ulm.de/803/1/DA\\_Wohlhaupter\\_12.pdf](http://dbis.eprints.uni-ulm.de/803/1/DA_Wohlhaupter_12.pdf)  
[http://en.wikipedia.org/wiki/Impact\\_factor](http://en.wikipedia.org/wiki/Impact_factor)  
<http://faculty.kfupm.edu.sa/math/kabbaj/Benchmarks/HoodWilson2001.pdf>
- R. N. Broadus. "Toward a definition of "bibliometrics"", *Scientometrics*, 11/1987
- Cole, F J and Eales Nellie B (1917), the history of comparative anatomy: a statistical analysis of the literature, *Science Progress* (11), p.578-596.  
<http://www.rcuk.ac.uk/documents/india/socialscienceresearchinsouthasia.pdf>  
<http://www.netugc.com/librametric-bibliometric-scientometrics-informetrics>  
<http://link.springer.com/article/10.1007%2FBF02016772>

- Earl Babbie (2010), the practice of social research, 10<sup>th</sup> edition, Wadsworth, Thomson Learning Inc., ISBN 0-534-62029-9. [http://danpritchard.com/wiki/Content\\_analysis](http://danpritchard.com/wiki/Content_analysis)
- Egghe L (2000), Lectures Potter, W G (1981) Introduction to Bibliometrics. Library Trends Vol 30, p.5.
- Egghe L (2000). A heuristic study of the first-citation distribution. Scientometrics 48(3), p.345-359. <http://www.hrc.ntu.edu.tw/thci/reference/data-doc3.htm>
- Fairthorne, R. A. (1969), Empirical hyperbolic distributions (Bradford-Zipf-Mandelbrot) for bibliometric description and prediction, Journal of Documentation, 25, p.319–343. [http://porteeconomics.eu/downloads-section/doc\\_download/163-2010trpallis-vitsounis-de-langen-.html](http://porteeconomics.eu/downloads-section/doc_download/163-2010trpallis-vitsounis-de-langen-.html) <http://skipper.gseis.ucla.edu/faculty/jfurner/00-01/287-4/287-4res.html> <http://lisstudycircle.blogspot.com/2010/10/bibliometrics-brief-introduction.html>
- Fairthorne R A (1969), Empirical hyperbolic distributions for bibliometric description and prediction, Journal of Documentation, 25, p.319. <http://publications.drdo.gov.in/ojs/index.php/djlit/article/viewFile/671/287>
- Farooq Joubish and Ashraf Khurram (2011), outlook on some concepts in the curriculum of social studies, World Applied Science Journal 12(9), p.1374-1377. ISSN 1818-4952. [http://en.wikipedia.org/wiki/Content\\_analysis](http://en.wikipedia.org/wiki/Content_analysis) [http://books.google.com.pg/books/about/Content\\_Analysis.html?id=7xHsQgAACAAJ](http://books.google.com.pg/books/about/Content_Analysis.html?id=7xHsQgAACAAJ)
- Fernando A D N (2004), Stepping stones and pathways: Improving retrieval by chains of relationships between documents, Virginia polytechnic institute and state university, Virginia, (PhD Dissertation) <http://scholar.lib.vt.edu/theses/available/etd-11012004-003013/unrestricted/dissertation.PDF> <http://www.iva.dk/bh/Core%20Concepts%20in%20LIS/articles%20a-z/reference.htm>
- Garfield, E (1974), Citation Indexing: Its theory and application in science, Technology and Humanities, New York, Wiley, <http://dewey.yonsei.ac.kr/imet/data/10/zhang628.pdf> [http://en.wikipedia.org/wiki/Citation\\_analysis](http://en.wikipedia.org/wiki/Citation_analysis) <http://dspaces.uok.edu.in/jspui/bitstream/1/193/1/Citation%20Analysis%20of%20Library%20Trends.htm> <http://www.webology.org/2009/v6n1/a67.html>
- Garfield, E. (1983). Citation Indexing - Its Theory and Application in Science, Technology and Humanities. Philadelphia: ISI Press. Retrieved November 4, 2011 from Located at <http://garfield.library.upenn.edu/ci/contents.pdf>. accessed on 12.04.2011.
- Garfield, E.(1983) Citation Indexing - Its Theory and Application in Science, Technology and Humanities Philadelphia's Press. [http://danpritchard.com/wiki/Citation\\_analysis](http://danpritchard.com/wiki/Citation_analysis) <http://www.webology.org/2009/v6n1/a67.html> <http://informationr.net/ir/9-2/paper168.html>

Online Information Review, Volume 28, Issue 3 (2006-09-19)

- Gooden, A.M. (2001). Citation analysis of chemistry doctoral dissertations: An Ohio State University case study. Retrieved October 13, 2008 Located at <http://www.istl.org/01-fall/refereed.html> accessed on 27.12.2011.  
<http://dspaces.uok.edu.in/jspui/bitstream/1/193/1/Citation%20Analysis%20of%20Library%20Trends.htm>  
<http://www.webology.org/2009/v6n1/a67.html>
- Google scholar blog (2011), Google scholar citations open to all, Google. Located at <http://en.wikipedia.org/wiki/H-index> accessed on 03.09.2011.  
<http://en.wikipedia.org/wiki/H-index> <http://www.absoluteastronomy.com/topics/H-index>  
<http://en.wikipedia.org/wiki/Informetrics>
- HSF , Impact factor  
<http://publication.human-sante-futur.com/> [http://www.thefullwiki.org/Impact\\_factor](http://www.thefullwiki.org/Impact_factor)  
<http://www.personal.psu.edu/arp14/> <http://en.wikipedia.org/wiki/H-index>  
<http://thatsnotmysquid.com/comic/z3m.php?p=journals-impact-factor>  
<http://www.ijpaes.com/impact-factor.php>
- Hawkins D T (1977), Unconventional uses of on-line information retrieval system on line British metric studies. Journal of American society for information science, 28(1), p.13-18.  
<http://www.lis.uzulu.ac.za/research/etds/gcsitienei/gcsitienei.pdf>  
<http://www.bitlib.net/t/the+literature+and+informetrics.html>  
<http://faculty.kfupm.edu.sa/math/kabbaj/Benchmarks/HoodWilson2001.pdf>
- Henderson, M., Shurville, S. and Fernstrom, K. (2009). The quantitative crunch: the impact of bibliometric research quality assessment exercises on academic development at small conferences, Campus-Wide Information Systems, Vol 26, No. 3, p.149–167.  
<http://en.wikipedia.org/wiki/Bibliometrics>
- Henderson, M., Shurville, S. and Fernstrom, K. (2009). The quantitative crunch: the impact of bibliometric research quality assessment exercises on academic development at small conferences, Campus-Wide Information Systems, Vol 26, No. 3, p.149–167.  
<http://en.wikipedia.org/wiki/Bibliometrics>  
[http://en.wikipedia.org/wiki/Citation\\_analysis](http://en.wikipedia.org/wiki/Citation_analysis) <http://danpritchard.com/wiki/webometrics>
- Higher Education Funding Council for England, Located at <http://www.hefce.ac.uk/Research/ref/>. and <http://www.ref.ac.uk/> accessed on 12<sup>th</sup> May 2012.

- Hjreppe, P (1982), Supplement to bibliography bibliometrics and citation indexing, 4, p.241-273.  
<http://www.bitlib.net/t/the+literature+and+informetrics.html>  
<http://faculty.kfupm.edu.sa/math/kabbaj/Benchmarks/HoodWilson2001.pdf>
- Hjreppe, R (1980), a bibliography of bibliometrics an dictation indexing and analysis, Royal institute of Technology library, Stockholm, Sweden. Located at  
<http://www.gslis.utexas.edu/~palmquis/courses/biblio.html#Laws> and  
<http://www.netugc.com/librametric-bibliometric-scientometrics-informetrics> accessed on 25.08.2012.  
<http://www.bitlib.net/t/the+literature+and+informetrics.html>  
<http://faculty.kfupm.edu.sa/math/kabbaj/Benchmarks/HoodWilson2001.pdf>  
<http://www.fundacite-merida.gob.ve/mesaredonda/?p=65&cpage=1>
- Hulme, E.W. (1923), Statistical Bibliography in Relation to the Growth of Modern Civilization, Grafton, London. p9.  
<http://www.bitlib.net/t/the+literature+and+informetrics.html>  
<http://www.netugc.com/librametric-bibliometric-scientometrics-informetrics>  
<http://microsites.oii.ox.ac.uk/tidsr/kb/48/what-bibliometrics-and-scientometrics>  
<http://download.analysis3.com/Webometrics-pdf.html> <http://lislinks.com/forum/topics/what-is-bibliometrics> <http://www.abm.uu.se/publikationer/2/2004/190.pdf>  
<http://ir.inflibnet.ac.in/dxml/bitstream/handle/1944/1318/70.pdf?sequence=1>  
<http://listas.cev.org.br/pipermail/cevbibli.mbox/cevbibli.mbox>  
<http://faculty.kfupm.edu.sa/math/kabbaj/Benchmarks/HoodWilson2001.pdf>
- Kalaioppa V , Kaliyaperumal K and Rajasekar V (2010), Scientometric analysis of literature output of Prof. G N Ramachandran in the subject of Biophysics and Crystallography, DESIDOC journal of library and information technology, vol. 30(6), p.3-11.  
<http://publications.drdo.gov.in/ojs/index.php/djlit/article/viewFile/671/287>
- Kannappanavar, B U (1991), Citation analysis of the doctoral dissertation in library and information science accepted by the universities in Karnataka, Karnataka University, Dharwad, p. 88. (Ph. D Thesis)  
[http://www.ideals.illinois.edu/bitstream/handle/2142/7189/librarytrendsv30i1\\_ocr.txt?sequence=1](http://www.ideals.illinois.edu/bitstream/handle/2142/7189/librarytrendsv30i1_ocr.txt?sequence=1)

- Kumar, Suchetan, Tiwari Charu and Deepu Mahija (2012), contribution to Indian sociology: A Bibliometric study, Language in India.  
<http://www.languageinindia.com/may2012/suchetanbibliometricfinal.pdf>
- Lal, A., & Panda, S (1996). Research in plant pathology: A bibliometric analysis. Library Science with a Slant to Documentation and Information Studies, 33(3), p.135-147.  
<http://www.webology.org/2009/v6n1/a67.html>  
<http://dspace.uok.edu.in/jspui/bitstream/1/193/1/Citation%20Analysis%20of%20Library%20Trends.htm>
- Lasswell Harold (1951), the analysis of political behavior: An empirical approach, Rautledge, London, p.525.
- Lotka A J (1926), the frequency distribution of scientific productivity, Journal of the Washington Academy of Sciences, Vol. 16 (12), p.317-323.  
[http://www.belspo.fgov.be/belspo/stat/meth/acrobat/Bibliomet\\_e.pdf](http://www.belspo.fgov.be/belspo/stat/meth/acrobat/Bibliomet_e.pdf)
- Malin M V (1968), the science citation index: A new concept in Indexing, Library trends, Vol. 16, p. 376. <http://www.lis.illinois.edu/academics/degrees/cas/cas-projects>  
<http://kaptur.wordpress.com/2012/05/28/minting-dois-for-research-data-in-the-uk/>
- Med Library (2011), <http://medlibrary.org/medwiki/References>  
<http://en.wikipedia.org/wiki/Reference>
- Fengjun Sun. "Citation genetic genealogy: a novel insight for citation analysis in scientific literature", Scientometrics, 12/31/2011
- Martin, M U (1968), Science citation index: A new concept in indexing, Library Trends, Vol. 16, p.376.  
[http://www.ideals.illinois.edu/bitstream/handle/2142/7189/librarytrendsv30i1\\_ocr.txt?sequence=1](http://www.ideals.illinois.edu/bitstream/handle/2142/7189/librarytrendsv30i1_ocr.txt?sequence=1)
- Martyn L A (1976), Use studies in library planning, Library Trends 24(30).
- Midrar Ullah. "The Journal of Ayub Medical College: a 10-year bibliometric study", Health Information and Libraries Journal, 2/25/2008
- Ming-Huang Wang. (2009), "A bibliometric analysis of the performance of Water Research", Scientometrics,  
<http://publications.drdo.gov.in/ojs/index.php/djlit/article/viewFile/671/287>
- Nann F et al (1976), Evaluative bibliometrics: The use of publications and citation analysis in the evaluation of scientific activity, cherry Hill, N J, Computer Horizon Inc, p.334-337.  
<http://www.lis.illinois.edu/academics/degrees/cas/cas-projects>  
<http://citeseer.uark.edu:8080/citeseerx/showciting?cid=441430>



[http://www.ideals.illinois.edu/bitstream/handle/2142/7189/librarytrendsv30i1\\_ocr.txt?sequence=1](http://www.ideals.illinois.edu/bitstream/handle/2142/7189/librarytrendsv30i1_ocr.txt?sequence=1) <http://researchletters.org/2012/01/15/what-is-the-difference-between-a-reference-and-a-citation/>

- Narin, Francis and et. Al. (1976), evaluative bibliometrics: the use of publication and citation analysis in the evaluation of scientific activity, Cherry Hill, New Jersey, Computer Horizon Inc. p.334-337.  
[http://www.ideals.illinois.edu/bitstream/handle/2142/7189/librarytrendsv30i1\\_ocr.txt?sequence=1](http://www.ideals.illinois.edu/bitstream/handle/2142/7189/librarytrendsv30i1_ocr.txt?sequence=1) <http://citeseer.uark.edu:8080/citeseerx/showciting?cid=441430>
- Newell 84 <http://www.princeton.edu/~achaney/tmve/wiki100k/docs/Citation.html>
- Neuendorf, Kimberly A. (2002), the Content Analysis Guidebook Thousand Oaks, CA: Sage Publications. <http://www.gravlee.org/files/pdfs/Gravlee%20%26%20Sweet%202008.pdf>  
[http://en.wikipedia.org/wiki/Content\\_analytics](http://en.wikipedia.org/wiki/Content_analytics)
- Nicholas, David and Maureen Ritchie (1978), Literature and Bibliometrics London: Clive Bingley, p.28-29. <http://en.wikipedia.org/wiki/Bibliometrics>  
<http://dbpedia.org/page/Bibliometrics>  
[http://en.wikipedia.org/wiki/Citation\\_analysis](http://en.wikipedia.org/wiki/Citation_analysis)
- Nicholas, David and Maureen Ritchie (1978). Literature and Bibliometrics London: Clive Bingley, p.12-28. <http://en.wikipedia.org/wiki/Bibliometrics>  
<http://dbpedia.org/page/Bibliometrics> <http://ency.cl/Bibliometrics>
- Ole R. Holsti (1969), Content Analysis for the Social Sciences and Humanities. Reading, MA: Addison-Wesley. [http://danpritchard.com/wiki/Content\\_analysis](http://danpritchard.com/wiki/Content_analysis)  
[http://en.wikipedia.org/wiki/Content\\_analytics](http://en.wikipedia.org/wiki/Content_analytics)
- Panda and Lal (1996)  
<http://dspace.uok.edu.in/jspui/bitstream/1/193/1/Citation%20Analysis%20of%20Library%20Trends.htm>
- Potter W G (1981), Introduction to bibliometrics, Library Trends, Vol. 30, p.5.  
[http://www.myjournal.my/filebank/published\\_article/17760/4.pdf](http://www.myjournal.my/filebank/published_article/17760/4.pdf)  
[http://www.lis.uzulu.ac.za/research/etds/onyancha/Onyancha\\_Chapter1-3.pdf](http://www.lis.uzulu.ac.za/research/etds/onyancha/Onyancha_Chapter1-3.pdf)  
<http://lisstudycircle.blogspot.in/2010/10/bibliometrics-brief-introduction.html>
- Pritchard A (1969), Statistical bibliography an interim bibliography, New Western Polytechnic school of Librarianship, London.  
<http://www.bitlib.net/t/the+literature+and+informetrics.html>  
<http://faculty.kfupm.edu.sa/math/kabbaj/Benchmarks/HoodWilson2001.pdf>  
<http://www.netugc.com/librametric-bibliometric-scientometrics->

informetrics<http://en.wikipedia.org/wiki/Bibliometrics>

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.97.5311&rep=rep1&type=pdf>

- Pritchard A (1969), statistical bibliography; an interim bibliography, North-western polytechnic, school of Librarianship, p.60. <http://riah.staff.uns.ac.id/2009/05/06/muasal-bibliometrika/> [http://www.jalis.in/pdf/pdf\\_27jun/20121209.pdf](http://www.jalis.in/pdf/pdf_27jun/20121209.pdf)
- Pritchard, A and Witting, G R (1960), Bibliometrics: A bibliography and index (1874-1959), Aaih Books, Westford, [http://www2.inescporto.pt/uitt/RePEc/09.03.19\\_wp3\\_TeixeiraSequeira.pdf](http://www2.inescporto.pt/uitt/RePEc/09.03.19_wp3_TeixeiraSequeira.pdf)
- Raising L (1962), Statistical bibliography in the health sciences, Bulletin the medical library Association, 50, p.450-461. <http://www.ahead.org/conference/proceedings/2004.pdf> <http://www.saujanyabooks.com/details.aspx?id=34768>
- Ranganathan S. R. (1969) Librametry and its scope. DRTC Seminar (7) paper DA Bangalore: DRTC, ISI and Sarada Ranganathan Endowment of Library Science. Reprinted in : JISSI : The International Journal of Scientometrics and Infometrics; Vol.1, No.1 (1995), p.15-21. (ISSN-0971-6696) [http://eprints.rclis.org/archive/00001039/01/Librmetrics\\_PDF.pdf](http://eprints.rclis.org/archive/00001039/01/Librmetrics_PDF.pdf) <http://www.netugc.com/librametric-bibliometric-scientometrics-informetrics>
- Rubin, Richard (2010). Foundations of library and information science (3rd ed.). New York: Neal-Schuman Publishers. ISBN 978-1-55570-690-6. Accessed at <http://books.google.com/books?id=Pk1TSAAACAAJ> accessed on 09.02.2012. [http://en.wikipedia.org/wiki/Citation\\_analysis](http://en.wikipedia.org/wiki/Citation_analysis)
- Sengupta. I. N. (1986), "Three new parameters in bibliometric research and their application to rerank periodicals in the field of biochemistry", Scientometrics, <http://en.wikipedia.org/wiki/Bibliometrics> <http://link.springer.com/article/10.1007%2F02016772>
- Suresh, L.. (2005) "Journal of Health Management: A Bibliometric Study", Journal of Health Management, Tonta Y and Umut Al (2004), Scatter and obsolescence of journals cited in theses and dissertations of librarianship, Hacettepe university, Turkey, <http://yunus.hacettepe.edu.tr/~tonta/yayinlar/tonta-al-lisr-15-July-05.pdf>
- Von Sara Ungern-Sternberg Applications in teaching bibliometrics, PhD, Senior lecturer, Abo Akademi University, Department of Library and Information Science, FINLAND <http://archive.ifla.org/IV/ifla61/61-ungs.htm>

- Sean Gaffney (2008), "Mapping the Literature of Food Science Revisited: 2003-2005", Journal of Agricultural & Food Information, <http://www.lis.illinois.edu/academics/degrees/cas/cas-projects>
- Schrader, Alvin M. (1981) Teaching Bibliometrics, Library Trends 30, p.151-172. <http://www.abo.fi/~sungern/comm00.htm>  
<http://publications.drdo.gov.in/ojs/index.php/djlit/article/viewFile/671/287>
- Sengupta I N (1990), Bibliometrics and its application in information science and libraries, Atlantic, New Delhi, p.256. [http://www.ijhssnet.com/journals/Vol\\_1\\_No\\_12\\_September\\_2011/24.pdf](http://www.ijhssnet.com/journals/Vol_1_No_12_September_2011/24.pdf)
- Sengupta, I. "A weightage formula to rerank biochemical periodicals", International Library Review, 1984:10
- Suresh, L. (2005), "Journal of Health Management: A Bibliometric Study", Journal of Health Management,
- Swapna Kumar Patra and Prakash Chand (2006), "Library and Information science Research in India: a Bibliometric Study" Annals of Library and Information Studies, Vol 53, December, p.219-223.  
  
Journal of Documentation, Volume 68, Issue 4 (2012-07-14)
- <http://www.springer.com/computer/database+management+%26+information+retrieval/journal/11192>
- Tonta Y and Umut AI (2004), <http://www.netugc.com/librametric-bibliometric-scientometrics-informetrics>
- Thelwall (2009) <http://en.wikipedia.org/wiki/Webometrics>
- Van Raan, A.F.J. (2003). The use of bibliometric analysis in research performance assessment and monitoring of interdisciplinary scientific developments. Technikfolgenabschätzung, Theories und Praxis/ Technology Assessment- Theory and Practice, 12(1), p.20-29.  
<http://www.forskningspolitik.se/DataFile.asp?FileID=103>  
<http://link.springer.com/article/10.1007%2F978-3-540-20167-2>
- Wallance (1989) <http://ejournals.library.ualberta.ca/index.php/EBLIP/article/view/17975/14308>

- Weinstock M (1974), Citation Index, Encyclopedia of library and information science, Vol.5, New York, Dekker, p.19. <http://www.nada.kth.se/~stefan/krbs.pdf>
- Zhang, Wei, and Yoshiteru Nakamori. "Trend analysis of service management researches", ICSSSM12, 2012. <http://toc.proceedings.com/15567webtoc.pdf>
- Zhenzhong Ma (2005), "From theoretical essentials to paradigms: the development path of electronic commerce research". International journal of electronic business, vol. 3(5), <http://www.deepdyve.com/lp/inderscience-publishers/from-theoretical-essentials-to-paradigms-the-development-path-of-ohnNSeP3di> [http://www.asis.org/Bulletin/Aug-12/AugSep12\\_Milojevic\\_Sugimoto.html](http://www.asis.org/Bulletin/Aug-12/AugSep12_Milojevic_Sugimoto.html)  
<https://www.ischool.utexas.edu/~palmquis/courses/biblio.html>
- Ziman John M (1968), Public knowledge: An essay concerning the social dimension of science, Cambridge, Cambridge university press, p.58.  
[http://www.ideals.illinois.edu/bitstream/handle/2142/7189/librarytrendsv30i1\\_ocr.txt?sequence=1](http://www.ideals.illinois.edu/bitstream/handle/2142/7189/librarytrendsv30i1_ocr.txt?sequence=1) [http://www.db.dk/jni/Articles/Nicolaisen\(2002c\).pdf](http://www.db.dk/jni/Articles/Nicolaisen(2002c).pdf)
- Zipf, G. K. (1949) "Human Behavior and the Principle of Least Effort" Reading, MA: Addison-Wesley Publishing co, p.34.  
<http://www.lse.ac.uk/collections/informationSystems/pdf/events/2003/LanzaraMorner.pdf>  
<http://ifiptc8.org/events/esrcseminars/LanzaraMorner.pdf>

## Chapter 4: Progress of Education and Research in LIS

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## **Chapter 4: Progress of Education and Research in LIS**

### ***4.1 Introduction:-***

Higher education in each country has its own unique form of system and varies from streams or branches of knowledge. Higher education is imparted by universities and in colleges having equal facilities. Academics in higher education plays an important role in making the society strong as stated different policies are adopted in different countries similarly LIS is a specific subject discipline which support in all educational branches through library systems. Schools of library science provide useful professional education universally and develop (Program, 2006) library and information professionals to manage the libraries efficiently. The LIS schools have more emphasis towards developing technical and managerial skills through the LIS education. Following paragraphs briefly narrated the status of LIS education.

### ***4.2 LIS Education: Global Overview:***

Tsuji et al (2006), pointed out it in his study that the main theme in LIS education Japan was developed qualified librarians (Shisho) and assistant librarians (Shisho-ho) for public libraries and as well as qualified teacher librarian (shisho-kyouyu) for school libraries. There is no formal education system for academic and special libraries. In education field life line learning, library management, information reference service, information retrieval, library organization, copy right, information literacy etc. were more focused.

Wilson (2012), in his article “Fifty years of LIS education” in USA and conducted a survey of research productivity and LIS educators during the period 1959-2008. Author narrated the progress of LIS education in USA and stated that prior to 1960s practicing librarians were teaching LIS education according to syllabus and examination conducted by library associations and similar status was also in Australia and Library Association Australia (now Australia library and information association (ALIA) was taking care of the education system.. Latter LIS education moved to higher education institute since 1980.

Chu (2006) in his paper “Curricula of LIS programs in the USA: A content analysis” in which the syllabi was reviewed by author from 45 ALA accredited LIS master programs in USA. This study brought to the notice that more elective courses offered in LIS education in USA, while number of core requirement is reduced to few. Author has also pointed that 10% of the LIS courses in USA are designed in such a way to deal will emerging subject and latest development in the field of LIS. Thus subjects covered in the syllabus deals with knowledge

organization, reference and information sources services, management, research in LIS, ICT, collection development, information use etc. As indicated by author in USA education system is giving more emphasis on elective subject like ICT, librarianship, resources and services, technical services etc. to manage latest situation. Now LIS courses clusters were introduced, which covers:

- Digital library
- Website design
- Internet library
- Network
- Digitization
- Knowledge management
- Metadata
- Network security
- Internet application
- Information seeking behaviour
- Multimedia
- Digital publishing etc.

#### ***4.3 Library and Information Science Education in India:-***

Joshi M K (2010) and Rana R (2011) LIS education in India is completing a century of its existence during the period progress have been achieved in developing LIS education to tune with current practices. Radhakrishnan Commission, Kothari Commission, National Knowledge Commission, UGC, NAAC put more efforts in education sector including LIS by establishing advisory commission for libraries, national policy for library etc. Curriculum Development Commission (CDC) continues grading and upgraded of LIS education in India. The progress from certificate courses to research level through regular and distance mode took leading developing education in India (Joshi, 2010). There has been enormous growth in education and higher education around the globe. Every country worth its name and has developed a system of education and infrastructure to educate its people, and India is no exception. There has been a fast growth in institution of higher education since the dawn of twentieth century and more particularly, after India attained independence in 1947. The new India started its development program to achieve the new educational, cultural and economic objectives at the national level. Such developments at these institutions contributed to the



development of more libraries, which in turn had to accept new responsibilities to meet society's changing needs and demands. Libraries are recognized to play an important role in education, scientific research and social-economic development of a country. This envisages the need for professionally qualified personnel to manage and run the libraries and information centres effectively and efficiently. In order to feed the growing number of libraries, more trained library professionals were needed. For this purpose, library science departments started springing up, and library science developed into a distinct field of specialization with its own normative principles, theories, techniques, and practices that were deemed sufficient to meet the growing dimensions of library services. Handling of recorded knowledge in modern libraries has given birth to the functional aspects of collecting, organizing and promoting the use of reading materials relevant to the users through information transfer activities. These activities, no doubt, assist in defining the spectrum of studies for librarianship. The basic tenet of LIS education is to provide balanced training, integrating theory with practical exercises, and to cover all aspects of professional work with equal emphasis embracing new frontier of librarianship. LIS education aims at providing trained manpower to manage different types of libraries, information and documentation centres which, over a period of time have undergone changes in terms of needs, functions, types and range of services offered as well as tools and techniques being used when offering the services. Research in library and information science in India is not deep rooted. In the beginning it was in the form of a trial and error method. It was Padamashree S R Ranganathan (1889-1972) father of library science who lifted trail librarianship to the level of a science with the formulation of laws of library science, and establishment library schools and research centres. He even graded them as normative principles, fundamental laws, canons, principles and postulates. Ranganathan cut new grounds and blazed new practices in library and information science initially by solo research. This is evidence from the published literature that Ranganathan era's is characterized by a period of intellectual contribution to the library and information science, particularly library classification. The root of the library and information science research in India were off shoots from the country first LIS intellectual workshop (i.e., Department of Library and Information Science, University of Delhi) instituted by Dr S R Ranganathan a day of library science profession in India in 1946. The first research degree in the library and information science in the country and even in the commonwealth countries was awarded by the University of Delhi in 1957 to D B Krishna Rao for his thesis 'Facet Analysis and Depth Classification of Agriculture' under the

supervision of Dr. S R Ranganathan.

#### ***4.4 Historical Development:-***

The modern period in the history of education for librarianship began in the mid-1800<sup>s</sup> as librarians around the world recognized that systematic education and training were required so that proper order could be brought to the collections that had been growing in all libraries. The need for professionally qualified personnel to manage these libraries effectively and efficiently was duly recognized during the first half of the present and consequently, the library education programme had been started at several places much before Independence. The history of the education of library science in India may be traced far back as the year of 1911 with the starting of a short term training programme in library science in the Baroda State, under the patronage of Maharaja Sayajirao Gaikwad of Baroda, who, impressed by the splendid work done by public libraries in the West, secured the services of an American librarian Mr. W. A. Borden as Director of the State Library Department. Mr. Borden had been a pupil of Mr. Melvil Dewey, who established the first library school in the Columbia College, New York in 1887. In 1915, another student of Dewey, Mr. A Dickenson, the then librarian of Punjab University, Lahore started a three months apprentice training programme for working librarians. Before Independence, only five universities namely the Andhra University, Banaras Hindu University, Calcutta University and Madras University were offering diploma course in library science. Library education was given a new status and design by Professor S. R. Ranganathan in 1920, when the first systematic programme in library education was started under the auspices of the Madras Library Association in collaboration with the Madras University. This library school was subsequently taken over by the Madras University in 1931 and in 1937 the course was converted into Postgraduate (PG) Diploma in Library Science. This was the first diploma programme in Library Science in India. University of Delhi was the first university to establish a full-fledged Department of Library Science just before independence in 1946, and started admitting students to the PG Diploma in 1947. In 1951, the diploma was changed to Master in Library Science (M.Lib.Sc). Later, between 1956 to 1959, six new LIS departments were established at Aligarh Muslim University, M.S.University of Baroda, Nagpur University, Osmania University, Pune University and Vikram University. Since 1960s, the number of LIS departments has continued to increase. After Independence the stimulus for the growth and development of libraries and library science education has come from the progress in and extension of education, scientific research and programmes of socio-economic development

which started in 1951 with the commencement of the First Five-Year Plan. As a result of these developments, Library and Information Science today is a well-recognized discipline of study and research at the post-graduate level in more than hundred universities in the country. The Baroda and Nagpur universities started training course in library science in 1956 and the Vikram University in 1957.

#### ***4.5 Present scenario of LIS Education in India:-***

Since its inception decades ago, LIS education has grown and developed into a full-fledged multi-disciplinary subject. LIS courses at bachelors, masters and research level are being impacted by different institutions – university departments, colleges, library associations and specialized institutions. There are now 96 universities in India imparting Library and Information Science education as independent departments in different levels. The list is shown in appendix. Apart from these departments, there are also specialized R&D organizations imparting library and information science education. Worth mentioning is the two years Associateship in Documentation and Information Science (ADIS) imparted by Documentation Research and Training Institute (DRTC), Indian Statistical Institute, Bangalore (Karnataka) and National Institute of Science Communication and Information Resources (NISCAIR) formerly INSDOC, New Delhi which is equivalent to Mater degree of Library and Information Science (LIS). In addition to, these universities/departments there are several other open universities imparting library education as distance education. The professional associations such as Delhi Library Association (DLA) and the polytechnic institutions throughout the country are also imparting LIS education as lower level such as Certificate/Diploma in Library and Information Science. With the realization of the importance of higher education and research, research in Library education is not lagging behind like other disciplines. The University Grants Commission (UGC) and the Indian Council of Social Science Research (ICSSR) are promoting to research activity in library and information science by awarding scholarships to research and doctoral students.

#### ***4.6 Objectives of Library and Information Science Education:-***

The goal of library and information science education is the preparation of personnel for the task of successful performance at different levels of competence in different types of libraries with an insight into the role of these libraries in a fast changing society. It should impart a thorough grounding in the intellectual foundations of the profession and competence in the technical and technological skills required for their day-to-day practice in different positions.

In other words, education for library and information science should be both knowledge and theory oriented task or practice oriented. The two aspects of theory and practice blend harmoniously in a sound programme of library and information science education because on this aspects LIS education depend the effectiveness and success of the programme. In achieving this objective the methods of teaching and evaluation employed are as important as the quality of the faculty. The main objectives of LIS profession are to provide training for building up leadership qualities among the LIS profession develop knowledge on the latest techniques of information storage, transfer and retrieval of information help to acquire necessary skills in handling information, accessing and application of electronic resources, tools and media; and help to know the latest developments in the Information Technology (IT) To sum up, the basic aims of library and information science education may be as follows

- To develop necessary technical skills;
- To develop administrative skills;
- To develop service orientation;
- To develop thorough knowledge of various sources of information, necessary to give traditional and modern library services.
- To develop professional awareness.

#### ***4.7 Levels of Education:-***

Out of the 96 university departments, 56 departments conduct one-year Bachelors degree and one year Masters Degree in Library and Information Science at the postgraduate level. Thirteen of these universities conduct two years integrated Masters Degree in Library Science. These programme further leads to M.Phil. and PhD levels. The levels of LIS education in India are discussed as follows in brief:

##### ***4.7.1 Certificate/Diploma in Library Science (C/D. Lib. Sc.):-***

Many polytechnic colleges, schools and Library Associations impart the low level of library science courses in India having duration of six months to one year. The basic qualification for these courses is 10+2. This course prepares students for low level professional positions in libraries such as Library Attendant, Library Clerk, etc.

#### ***4.7.2 Bachelor of Library and Information Science (BLIS) after any graduation:-***

This is a one-year post graduate degree course. The basic eligibility is a three years degree from any discipline. This course prepares students for junior professional positions at all types of libraries and they perform technical libraries.

#### ***4.7.3 Master of Library and Information Science (MLIS):-***

In the early 19<sup>th</sup> Century, young people learned librarianship by working under the more experienced practitioners. But, gradually the tasks performed by librarians became more complex and more dependent on technology. As a result, the study of library science has moved from the work-setting to professional schools in Universities. The first ever library school was started by Melvil Dewey in USA in 1887 at Columbia College (now Columbia University). In 1889 the programme moved to the New York State Library in Albany when Dewey became the Director there. The success of Dewey's training programme and the publication of Training for Library Service, a book by the economist Charles Williamson in 1923, led other universities, institutes of technology, and large public libraries to establish their own professional degree programmes in library science. Master of Library and Information Science is imparted as a one-year post graduate degree course in some universities while in some, it is conducted as a two years integrated course. Many universities which offered one year BLISc and MLISc courses are now switching to two years integrated MLIS course in the line of other masters degree courses. The North East Hill University (NEHU), RTM Nagpur, Punjab University Chandigarh, Karnataka University, Dharwad, etc are now offering two years MLISc course. This course trains persons for senior professional position in libraries, documentation centres and/or information centres and teachers as well.

#### ***4.7.4 Associateship in Documentation and Information Science (ADIS):-***

The Documentation Research and Training Centre (DRTC), Bangalore (Karnataka) offers two years Associateship in Documentation and Information Science (Now know as Master of Science in Information Science). The National Institute of Science Communication And Information Resources (NISCAIR), New Delhi , formerly INSDOC also impart two years documentation programme i.e., Associateship in Documentation (AID) after graduation. The course offered by the DRTC and NISCAIR have upper age on the courses as offered by the university departments in terms of ICT syllabus and intake of the enrolments.

#### ***4.7.5 Master of Philosophy in Library and Information Science (M.Phil):-***

In Library and Information Science prepares a student for further advanced research in LIS. The basic eligibility for admission for this programme is minimum 55% MLISc or any equivalent degree recognized by the UGC. With candidates having more qualifications are being preferred for superior position, many students are opting for M.Phil. Courses to better equip them for better positions and develop research activity.

#### ***4.7.6 Doctor of Philosophy of Library and Information Science:-***

This is an advanced level of research programme being offered after the completion of MLISc or M.Phil. The general aim of a research degree, whether M.Phil. or Ph.D. is to provide training in doing research as well as to develop in the candidate a critical and analytical process of thinking with the purpose that they would be able to provide leadership in the profession. They would also be able to help librarians and information scientists to develop techniques and skills required to meet their requirements of the fast changing society. They should be able to identify the needs, set objectives, identify and analyze the problems and find appropriate solutions. They would also be in a position to participate in the planning, organization and implementation of programmes at various levels.

#### ***4.8 First Course of Library Science in India(Certificate, Diploma and Training courses):-***

In India the existence of in service training was initiated by John Macfarlane, the first librarian of the Imperial Library (Now National Library) at Calcutta from 1901-06, as mentioned in some reports. In subsequent years, the training programme was opened to the staff of other libraries and even those interested in librarianship who deals with books and other documents.

##### ***4.8.1 Baroda School:-***

In 1911, Sayajirao Gaikwad (1862-1939), the ruler of Baroda state called the American librarian Mr. William Allenson Borden (1853-1931), a disciple of Melvil Dewey to create a cadre of men for the newly established libraries in the state library system. In 1912, he initiated the first training school in library education in India. In 1913, another training class

for working librarians of town libraries was started. These classes continued even after the departure of Borden.

#### ***4.8.2 Lahore School:-***

In 1912, the Punjab University called another librarian Mr. Asa Don Dickinson (1876–1960) from USA. He started the second educational course of three month duration in library science in the year 1915. This happens to be the first university course in India. Mr. Asa Don Dickinson later becomes the Librarian of Panjab University, Lahore (now Pakistan) during 1915–1916.

#### ***4.8.3 Andhra Desha:-***

The Andhra Desha Library Association (founded in 1914) started conducting “training classes for the library workers” at Vijayawada in 1920. The classes covered a module on running adult education classes in addition to library technique.

#### ***4.8.4 Mysore State:-***

In 1920, a course for the training of librarians was conducted at Bangalore under the “program of library development” initiated by the then Dewan of Mysore Mr. M. Visweswaraya.

#### ***4.8.5 Madras Library Association:-***

A summer school for college librarians and lecturers in charge of college libraries in Madras was held in 1928 and repeated in 1930. The Madras Library Association also organized a regular certificate course in library science from 1929. Then in 1931, University of Madras took up the training course of MALA in 1931 and started offering the course on a regular basis.

#### ***4.8.6 Andhra University:-***

Andhra University started a certificate course in 1935, which was later abandoned.

#### ***4.8.7 Imperial Library, Calcutta:-***

The Imperial library, Calcutta started a training class under the supervision of its librarian Mr. K. M. Asudulah in 1935. It was a full time regular Diploma course in librarianship at the Imperial Library, Calcutta (now National Library, Kolkata). It continued till 1946.

#### ***4.9 Post Graduate Diploma courses:-***

University of Madras, in 1937, introduced a one year Post Graduate Diploma course in place of the certificate course of three month duration. This was the first P G Diploma in library science in India. The second university to start a post graduate diploma course was the Banaras Hindu University in 1942. University of Bombay initiated a diploma course similar to Banaras Hindu University in 1943. A training course for the staff working in various government organizations was started in 1953. This course was recognized as equivalent to the university diploma courses.

#### ***4.10 Degree Courses:-***

In 1947, Aligarh Muslim University started B.Lib. Science Course for the first time in the country. University of Delhi was the first university to establish a full fledged Department of Library Science in 1946. It also instituted the first post diploma degree course in 1948. In 1949, the structure was changed. The programme of Master of Library Science was introduced as a two year course with the first year leading to Bachelor of Library Science. In between 1956-59, six new LIS departments were established at Aligarh Muslim University, MS University of Baroda, Nagpur University, Osmania University, Pune University and Vikram University. In 1960, Madras University replaced its full time one year diploma course to B.Lib.Sc. Degree course. By mid 1960, many other universities had fallen in the line of university of Madras following the recommendation of Review Committee Report of UGC in introducing different degree courses. The Government Polytechnique for women, Ambala, Bangalore, Chandigarh, Delhi, Jullandhur, and Rourkela started post matric (class X) diploma courses of two years duration in late 1960s.

#### ***4.11 Documentation Research and Training Centre (DRTC):-***



In 1962, Dr. S. R. Ranganathan established Documentation Research and Training Centre at Bangalore. Previously DRTC courses were of 14 month duration which was later on moved to two years programme. INSDOC conducted a short term course for Asian Documentalists in 1963. In 1964, it started a one year post graduate course in Documentation and Reprography leading to “Associateship in Documentation and Reprography”. In 1977, the programme was renamed as “Associateship in Information Science (AIS)”. On September 30, 2002, INSDOC merged with the National Institute of Science Communication (NISCOM) and was renamed as National Institute of Science Communication And Information Resources (NISCAIR). At present, it is conducting “Courses in Information Science”.

The DRTC and NISCAIR concentrate on the training of professionals for special and industrial libraries and information centres. Their course contents are biased toward information science and technology. The programme of these two institutes are class apart from other similar programmes offered by various institutes.

In India advanced professional education has remained attached to universities, though there are some regional library associations conducting certificate courses of a few months duration and women polytechnics offering post-masters two year diplomas in library science to train paraprofessionals. At present, about 107 institutions, mostly university colleges and polytechnics, have library science education courses. Out of these, M. Lib. I. Sc. course is being offered by more than 75 universities.

#### ***4.12 Five Year Integrated Course in LIS:-***

In 2010, University of Calcutta introduces five year integrated course in Library and Information Science and thus becomes the first university to launch such course in LIS domain. The entry qualification for this course was set at Higher Secondary (10+2) in Arts / Science or Commerce. Launching of this course will force the learners to choose the LIS by choice and not by chance. It will again help the students to grasp and understand the contents for LIS in a better and exhaustive way.

#### ***4.13 Present Status of LIS Education in India:-***

Only few departments and associations now provide Certificate Courses in Library and Information Science (CLIS) and Diploma in Library and Information Science (DLIS). The

others provide BLISc and MLISc courses. In most of the universities, the prerequisite for admission into the Bachelor or Master degree course in Library and Information Science is 10+2+3 years of education from any faculty (arts, science, commerce etc). The majority of the universities generally conduct two separate courses for the Bachelor's degree followed by the Master of Library and Information Science of one year (or two semesters) duration each. In recent years, some institutions have offered two years of integrated courses of four semester duration. The University of Calcutta went a step ahead and introduced five years integrated course in LIS with entry qualification as 10 +2. Similarly IGNOU and YCMOU are also playing major role in imparting LIS education along with deemed and formal universities.

#### ***4.14 Specialization:-***

Students in most schools of library and information science have the opportunity to develop at least some degree of specialization. Some may take advanced courses in particular library functions, such as reference work, while others may take courses related to a particular type of library, such as a course in medical librarianship or public librarianship or academic librarianship. In simple, there are many different courses available in LIS. It makes the professionals available to work at all levels of library irrespective of type, structure and function.

#### ***4.15 Syllabus:-***

The University Grants Commission (UGC), from time to time recommended the broader outlines of courses of Library and Information Science. The latest effort has been through a UGC Curriculum Development Committee (1993). The UGC and other higher bodies now give emphasis to semester system rather than annual system, and credit-based rather than marks-based system. Every university being autonomous is free to frame its own course of studies, and syllabi of many universities / schools are quite modernized.

All programmes to educate librarians share certain characteristics. Programmes typically offer courses in the history of books and librarianship to give students a background in the profession's past. It also includes courses in knowledge organization (classification,

cataloguing, bibliography, indexing & abstracting, Metadata, semantic & syntactic analysis, controlled vocabularies, etc.), collection development (acquisition), information seeking behaviors of users, search strategies, library services (dissemination of the acquired library materials, reference), and management of the collection (preservation & conservation of documents). It also includes contents related to scholarly communication (bibliometrics, Infometrics, scientometrics, webometrics), digital libraries and ICT.

#### ***4.16 ICT as an Integral Part:-***

Technology is entering in a very big way in every sector and in LIS where it has been used extensively to store and retrieve information in different forms and structures. This new dimension is reflected in the course structure of almost all universities that provides courses in LIS. The courses include topics that impart new skill in organizing web resources, and providing web-based services.

#### ***4.17 Practical Exposure:-***

All courses provide scope of practical knowledge rather than restricting to only theory. Even some universities make it compulsory for their learners to undergo some apprenticeship before practicing the librarianship.

#### ***4.18 Problems with Present LIS Education and Research:-***

##### ***4.18.1 Limited Accommodation Capacity:-***

All universities which provide Library and Information Science courses witness a great flow of learners. But they are able to accommodate only a limited number of such desired students.

##### ***4.18.2 A Very Competitive Entrance Examination:-***

In most of the universities, students desire to study the LIS has to go through a very competitive entrance examination for admission.

##### ***4.18.3 Limitation as a Professional Subject:-***

LIS is a professional course and so it has the limitations of any other professional courses. The non-inclusion of Library and Information Science in UPSC, Civil Service / State Public Service Commission examination, SET / SLET is a very common.

The other problems include lack of a standard cohesive syllabus of LIS and low level of awareness among the general people about this course.

#### **4.19 LIS Research in India:-**

The LIS research briefly means the collection and analysis of original data on a problem of librarianship, done within the library school according to scientific and scholarly standard. Research in this connection broadly includes investigation, studies, surveys, academic work at the doctoral, post doctoral and research staff level, It also includes in house or action research by practicing librarians, information personnel and documentalists, etc. The aim of research in LIS, like any other discipline is to contribute towards the advancement of subject and contribution to the existing knowledge.

##### **4.19.1 Dr. S. R. Ranganathan's Effort:-**

The era of LIS research in India started with S. R. Ranganathan's efforts . He performed individual research for several years. His works that lead to some of the fundamental and theoretical principles have dominated the research activities for five decades. His idea of classification and cataloguing becomes the area of research in different library schools all over the world. The library and academic community of those days, even today also respect him as a pioneer researcher in LIS. Some of his worth notable contributions are

- a) Five laws of library science
- b) Colon Classification
- c) Prolegomena to library classification
- d) Classified Catalogue Code
- e) Documentation and its facets
- f) Library administration, etc.

In India research activity to reflect in two programs.

##### **4.19.2 M. Phil Programme:-**

**i) University of Delhi:-** University of Delhi was the first to introduce M. Phil programme in Library and Information Science in 1980. Today more than 11 universities offer the M.Phil programme. The duration of M. Phil programme in almost all universities in this country is one year.

##### **4.19.3 PhD Programme:-**

**i) University of Delhi:-** The credit for introducing the doctoral degree programme in library science in India goes to Dr. S. R. Ranganathan (1892–1972). In 1951, he started PhD program in Delhi University in 1958. The university offered first doctoral degree in Library science to D. B. Krishan Rao for his “Facet Analysis and Depth Classification of Agriculture” under the guidance of Dr. S. R. Ranganathan. In 1977, Panjab University, Chandigarh offered the second Ph.D. Today more than 125 Universities in India have Ph.D. research facilities.

**ii) Documentation Research and Training Centre (DRTC):-**

In 1962, Dr. S. R. Ranganathan established Documentation Research and Training Centre at Bangalore. Since its inception, it has been carrying out research studies on documentation and related areas.

**iii) Library Associations:-**

The contribution of library association of India towards research activities is negligible but they restrict their activities in the field of publication of journals, organization of seminars, conferences and workshop, etc. for making ground to do research in LIS. IATLIS, NASSDOC, ILA, IASLIC are the mentionable among them.

**iv) Funding of LIS Research in India:-**

The University Grants Commission (UGC) is promoting LIS research by awarding different kinds of fellowships to the students. Indian Council of Social Science Research (ICSSR) and Defence Scientific Information and Documentation Centre (DESIDOC) are also promoting LIS research programme by awarding scholarship to doctoral students.

**v) D.Litt Programme:-**

In 1992, Utkal University, Bhubaneswar awarded D.Litt. to Dr. B. B. Shukla. It claimed to be the first such degree in library science all over the world.(Kumar, 1998)

**4.20 LIS Research : Global Overview:-**

Rochester and Vakkari (2003) conducted various national studies of different countries to analyse the trends in LIS research at global scenario and record the research trends in LIS research at global level based on the analysis. The different national studies in research were conducted by these two authors as an assignment of IFLA project during 1997-1998 and

Rochester (1998) compared national and international trends in LIS research and recorded the development in research. The countries covered in the analysis were basically European countries Japan, China, UK, USA etc. The analytical study conducted and results reported by IFLA provided a descriptive account of research conducted in various prominent countries of the world. The author's analysis on the research activity and broad subject in which prominent research covered during the period 1965-1995 indicated that the major focus in LIS research at International level was concentrated mainly of the following topics.

1. Information storage and retrieval (87)
2. Library and information services (77)
3. Information seeking behavior (8)
4. Other LIS topics (25)

Thus out of 197 research studies it was reflected that ISR, LIS services and ISB were in prominent areas. Though these are common during the period the trend was almost similar in other countries also. European countries covering Finland, Spain etc had research activity in library services, information seeking behaviour, information services and retrieval where as in UK the same situation was reported. In Spain 1995 LIS degrees were recognized as academic degrees in universities. Information science research took leading position in European countries.

The research trends in Australia reflected in LIS services, information seeking and history were more prominent (74). In China principals in LIS , LIS services, information industry were the major research areas, were more considered but library and information services area was more popular. The most popular sub topics on which research was conducted more during 1965-1995 in China were :

- Classification
- Automation
- Collection development
- Information retrieval
- Library management and administration
- Library use

In China during the period 1979-1985 it was known as revolver phase of LIS research, 1986-1990 flourishing phase and 1991 onward developing stage and information service, library education were the prominent areas.

A comparative study conducted Vakkari (1996) for LIS research in Scandinavia countries like Denmark, Finland, Sweden, Norway; Spain etc. also reflected European trends in LIS research. Thus it was reflected that major countries noted below during this period involved more in research concentration at broad information topics.

- Denmark 47
- Finland 44
- International 40
- Spain 38
- Sweden 33
- Norway 26
- Turkey 21
- Australia 16

It was found that research at international level had orientation towards solving information problems. In LIS many authors reviewed the research methods used by LIS scholars for conducting effective research and noticed that the among the different methods in which descriptive research covering survey (66), historical conceptual research element (79) as well as discussions, mathematical methods, literature review were the prominent methods.

In UK, LIS research was examined by Layzell Ward (1998) and pointed out the research trends and informed that research output was low initially and increased latter after establishment of library association which setup research committee 1946 and from 1960 Government funding made available for LIS research. Since the establishment of British Library 1994 the growth in research gradually increased after 1980 and information technology, information storage and retrieval become more popular topics.

From the above global study it is noticed that LIS research progress was slow and different topics were grouped in to three areas based in traditional practices and since 1990 area were shifted towards modernization covering :

1. Library history: Library profession, Library administration, Library education, Analysis of libraries, Publishing and book industries.
2. Library and information services: Circulation, Collection development, Information and seeking behavior, User education
3. Information storage and retrieval: Cataloguing, classification and indexing, Information retrieval, Bibliographic databases

4. Information seeking behavior: Methods of information dissemination, Information sources, Information seeking behavior in different subject, Information use, Information management
5. Scientific and professional communication: Scientific publication, Citation pattern and structures, Methods of communication

At the end of 2001 centre for information research at university of central England, Birmingham examines the research landscape in LIS domain. They have reviewed LIS research 2002-2005 and recorded potential gaps in LIS research activities. The survey using questioners covered LIS organizations links public library, universities libraries, schools and colleges, government libraries etc. the survey was focused on core areas in LIS. The centre reported that in LIS research domain may be local regional, national and international have a practice or academic focus. Hayns et. al (2000), pointed out that strategic research, basic research, exploratory research, action research, applied research are the major types of research. Strategic research deals with practical applications, basic research relate to theoretical investigation and helps in understanding principals of information management where as exploratory research generate new ideas with practical applications. Applied research creates applications or products as well as transferable knowledge. Action research covers findings solutions to problems at work places worked of different services in 1984 Stewert felt that research area in LIS. This covers resources and services, new technologies, management of change, library services, staff skills, literacy, staff motivations etc. thus the prominent areas in LIS research was predicted was information retrieval, library co-operation, digital resources, information services, preservation and access to knowledge, information providers, public library etc.

Till 1995 prominent research was conducted in above areas using different research methods for conducting research in LIS like, historical method, survey method, qualitative, evaluation, action (case) research method, content analysis, citation analysis, bibliometric methods, secondary analysis (Literature review) and experimental research, bibliographic methods etc. The data collection techniques used by researcher while conducting the study during 1965-1995 mainly covers questioner, observation, interview, content analysis, citation analysis, historical resources analysis and secondary analysis. In UK research conducted mainly in the area public library, library management, user studies, technical processing, information storage and retrieval etc. (Meadows 1994, 1995).



Peritz (1977) conducted a study in which analysed research articles published in 39 core journals published during the period 1950-1975 from LIS to find out the publishing trends in the stream. Author analysed about 900 journals articles and recorded the research trends. Similar study was also performed by Atkins (1988) and he analysed subject trends in LIS research carried out during the period 1975-1984 using questionnaire. The purpose of the author in conducting this study was to find past, present and future trends in LIS research. Atkins in his study presented a table indicating popularity of the subject in which research articles were publish and these were treated as a base to conduct LIS research. The areas isolated by him are :

1. Library management
2. Information retrieval
3. Databases
4. Cataloguing
5. Public library
6. Library automation
7. Library history
8. Library finance
9. Collection development
10. Information services
11. User study
12. Preservation
13. Copyright
14. Acquisition
15. Citation studies
16. Special libraries
17. Research libraries
18. Library education
19. University library
20. Library building
21. Special collection
22. National library
23. Library security

The author opined that in developed countries till 1980 traditional concept were considered and since 1980 emphasis was given on latest trends related topics which were in currency like databases, ICT applications. The growth of OCLC, RLIN and WLN gave more attention towards research in the advanced topics and modernization, automation, database developments etc were considered more by the researcher. "Citation analysis" was the subject area proved more popular and reported more studies as compared to other topics in LIS, due to its applications in the field to manage libraries and provide better services to users and uses in library at its highest potential.

Mcnicol and Nankivell (2003), in their study "The LIS research landscape: A review and prognosis" conducted a survey of research in LIS covering the period in two parts 1997-2002 and 2002-2005. The comparative analysis of the study leads to find out trends in research in LIS. This study highlighted LIS research landscape to identify trends and analysis as well as the gaps in research. Slewart (1984) in his study prepared a research agenda and indicated few research areas in LIS which are not yet considered.

1. Resources utility and user and services requirement
2. New technologies
3. Management change
4. Library services
5. Staff skill
6. Literacy
7. Retraining staff
8. Restructuring libraries

Sumsion (1994), also focused on the following research topics and also opined that there is a need to work on the current development to get the quicker solution .

1. Library principals
2. Identify trends
3. New user needs
4. New type of services

Pluse and Prytech (1996), studied and analysed LIS research conducted during 1990-1996 and identified few prospective areas like:

1. Operational management

2. Standards and benchmarking
3. Use of internet
4. Networking
5. Staffing pattern

Few authors pointed out areas of research conducted in UK, USA during period 1996-2002 after a study and reported few of the prominent areas considered more in developed countries are:

1. Information retrieval
2. Information skill
3. Networking
4. Professional development
5. Digitization
6. LIS research
7. LIS education
8. User development
9. Electronic services

Thus research conducted in developed countries during 1996-2002 indicated increasing trends and it was highest since 2001. Further while indicating future research development themes for research activities suggested were,

1. Electronic information
2. Information policy
3. Multimedia policy
4. LIS education
5. Business information

Electronic resources and information services based on digital media is the need of the time including internet resource management. Few prominent subjects presented to undertake future studies are:

1. Impact of digital resources
2. Digital library development
3. ICT and school library
4. Use of electronic resources

5. Community building
6. Controlled vocabulary
7. Information searching
8. E-resources
9. E-learning
10. Semantic web and controlled terminologies

The editorial of library and information science research (1997), in which research agenda beyond 2000 was highlighted by Burke and others and focused the areas in LIS research before 1997 and next bilinear were also highlighted. Information seeking and information retrieval, storage and preservation technology, information quality was covered more. The opinion of editorial board covers the major topics like economics, manage rising cost of journals, electronic publishing, information retrieval, internets and its impact on libraries, bibliographic information resources, library services, quality information services, information need/assessment, managing organizational change due to application of information technology, digital information services, web technology, value added information services are the major core areas to be looked in to 2000 onwards.

Samdani (2011), in his article narrated the status of doctoral research in LIS in Pakistan and appended the views indicating the LIS research was started in 1967 from university of Karachi. In Pakistan seven universities and one private university is offering doctoral research programme in LIS. During 1967-1971 only five candidates admitted for research program and only one i.e. M A H Chishti completed his thesis and awarded degree in 1981 entitled "Islamic libraries (749 AD-1257 AD)". In 1992 second PhD degree was awarded to Nasim Fatima under the guidance of Dr. Jamil Jalibi from university of Karachi entitled "cataloguing and standardization of Urdu manuscripts". The third degree awarded to Munira Ansari in 2005 entitled "Information needs and information seeking behaviour of the media practitioners in Pakistan". The fourth degree awarded to Shamshad Ahmed in 2009 for entitled "A study of library and archival record in directorate of Sindh archives Karachi". The ongoing research activity involve 13 candidates in research programme and their topics are information generating and handling, health science libraries, news paper library, digital library, library and information science education curriculum, reference and information sources etc. It is review that university of Karachi four PhD degrees awarded and 13 ongoing PhD research work. (Uhegbu, A. N., 2011).

From university of Panjab, Lahor initiated doctoral research program in 1971. First degree awarded in 2004 and second degree awarded in 2005. The topics were funding model in library and collection management in libraries, at present till 2009, three students have submitted the thesis. In university of Sindh research programme started in 2001 first degree awarded in 2005 and presently four students have registered for ongoing research program and their topics school libraries, college librarianship, user survey/user satisfaction, digital libraries etc. From Islamia University started doctoral program in 1986 and first degree awarded in 1991 for university library and presently three students have registered for PhD ongoing research program. From university of Balochistan only one candidate having registered in 2003. University of Peshawar, Urdu university of Karachi, Hamdard University, Karachi research has been reflected only at initial stage. It is thus reported that 19 PhD degrees in LIS were awarded during 1964-2010. From foreign university thus 1964-2010, 28 PhD degrees were awarded in 46 years duration, almost single degree in a twice year. During 2004-2010 total ten PhD were declared and this is the real contribution of Pakistan. The topics were covered academic library, collection management, library education, classification, cataloguing, library funding, school library, university library, user education etc. as compared Indian progress is excellent.

Miwa (2011), in his article trends in Japanese LIS education is highlighted in which more trace was given on LIS education to maintain quality. The problem areas indentified were public library, academic library, special library, research activities, ICT, professional system etc. it has also same educational pattern followed in India i.e. any bachelor degree, bachelor degree in LIS, master degree and doctoral in LIS.

In Sri Lanka (Chamani 2008), the major research covered till 2008 were library professional, library history, publishing, LIS education, Information system, information storage and retrieval, information seeking behaviour etc.

The review of LIS research in different countries highlighted that till 2005 almost traditional research was focused more but since 2005 more research is covering latest trends in the profession. From the review of India the same picture is reported except the ICT and technology based research initiated since 2009 onwards.

#### ***4.21 Research trend in Indian Universities:***

The research activity in Indian universities is gathering momentum as there is a greater demand for the research in the discipline. During the recent past, quite a number of research activities have been carried out in the universities and research institutions in various parts of the world. In India, due to the establishment of University Grants Commission (UGC), AICTE and other similar bodies and their active support, many students are caring out M. Phil. and PhD degrees. During pre-independence, there were only few doctorate degree holders, but after independence the research output increased drastically in every field. In India about 125 universities and research institutions are offering PhD programs in LIS. Many researchers made an effort to collect data from different universities and analyzed it to fix the research productivity of the various universities in India (Chandrashekara 2009).

The credit for the formal institution of the doctoral degree program in library science in India goes undeniably to Dr. S.R. Ranganathan (1892–1972). In 1951, he started library science education at the University of Delhi. The University of Delhi awarded the first de jure degree in library science in 1957 to D.B. Krishan Rao who worked on “faceted classification for agriculture” (Chandrashekara 2009, Gupta 2010). Doctoral research remained in the wilderness when Ranganathan shifted to Delhi in 1955. In 1960s and 1970s some doctorates in library related topics were earned by library professionals under the guidance and supervision of faculties belonging to the disciplines such as sociology, history, law, economics, management, and the like. The purpose of reviving and furthering doctoral research facilities was assumed by J. S. Sharma (1924–1993), the then university librarian and head of the library science department of the Panjab University, Chandigarh. Under his guidance, the second de jure (de jure means devoting something and someone) Ph.D. in library science was awarded in 1977 after a gap of two decades. Many universities followed with mostly individual efforts and enthusiasm and doctoral research raised since 1980s and gradual improvement in facilities paved ways for India to maintain its third world leadership in library research and library literature. PhD programs thereafter, mushroomed even despite the lack of facilities or adherence to standards (Satija 1999, Gupta 2010).

Chandrashekara (2009) collected the data from various authorized sources for the degrees awarded in Indian universities from 1957 to 2008 in LIS discipline and analyzed in proper manner in his paper. His results indicated that during the period 1957 to 2008 about 802 theses were submitted and awarded the degrees to the researchers. From his analysis it is very clear that LIS researches gained momentum since 1991 to 2008 and on an average

degree awarded per year were 36 and from 1957 to 1990 only 8 per annum average degrees were awarded. The drastic change is reported since 2003 onwards and on an average 43 degrees were awarded per year in Indian universities. Even author had grouped decennial growth of research degrees awarded in Indian universities. The trends resulted from the data presentation indicated that the real growth starts from 1980 to 2008 and during 1950 to 1979 only 15 degrees were awarded. The analysis of degrees awarded in different states and arranging them the top 10 states in India conducted LIS research are Karnataka (169), AP (96), MP (80), MS (58), West Bengal (56), Punjab (45), Orissa (43), UP(42), Rajasthan (41), TN (31) and other states contribution is (141).

The analysis made by Chandrashekara and Ramashesh (2009) regarding the research conducted in India during the period 1957-2008 and found that research activity in Karnataka state is leading and Maharashtra is ranked at 4<sup>th</sup> position.

### ***Summary:-***

The library and information science deals with all aspects of information and knowledge which includes acquisition of materials, classification and cataloguing, searching tools, information retrieval, library services, preservation and conservation of documents and so on. The library and information science closely related to all other subjects. It forms its own foundation by taking the help of some other subjects. Dr. S. R. Ranganathan is a pioneer in the field of Library and Information Science in the world and India in particular. He contributed in almost all aspects of the library science. Nowadays many university and colleges provides different courses in Library and Information and its related subjects. It ranges from certificate course to PhD. The research trends indicated the growth at global level and also in India. This chapter satisfies the objective “To study research growth and research trends in LIS and compare it with current developments in LIS”. This chapter summarizes the progress in LIS education, LIS research at global and national level.

### ***Reference:-***

- Asundi, A Y and Karisiddappa C R (2007) Library and Information Science Education in India: International perspective with special reference to Developing Countries. DESIDOC Bulletin of Information Technology Vol. 27(2) March, p.5-11.  
<http://lsrj.in/UploadedArticles/110.pdf>

<http://publications.drdo.gov.in/ojs/index.php/djlit/article/view/127> on 07/10/12.  
<http://www.netugc.com/library-and-information-science-education-in-india>

- Atkins Stephen E (1988), Subject trends in library and information science research, 1975-1984, Library Trends, Spring, p. 633-658.  
<http://eprints.rclis.org/archive/00001070/fullmetadata.html>
- Barman Badan (2012), Library and information science education, Accessed at <http://www.netugc.com/library-and-information-science-education-in-india> dated on 14.04.2012 <http://www.netugc.com/library-and-information-science-education-in-india>
- Burke R M and others (1998), A research agenda beyond 2000, Library and information science research, Vol. 19(3), p. 209-216.  
<http://bbf.enssib.fr/sdx/BBF/frontoffice/2005/02/document.xsp?id=bbf-2005-02-0007-002/2005/02/fam-dossier/dossier&statutMaitre=non&statutFils=non>
- Chamani G (2008), library and information science research literature in Sri Lanka: A bibliometric study, journal of the university librarians association of Sri Lanka, Vol. 12.  
  
Journal of Documentation, Volume 68, Issue 4 (2012-07-14)
- Chu H (2006), Curricula of LIS programs in the USA: A content analysis.  
<http://www.coursehero.com/file/1303179/SHiggins4/>
- Chandrashekara, M and Ramasesh, C P (2009) Library and Information Science Research in India. Asia Pacific Conference on LIS education and practice, p.530-537.  
<http://a-liep.kc.tsukuba.ac.jp/proceedings/papers/a65.pdf>  
  
<http://a-liep.kc.tsukuba.ac.jp/proceedings/papers/a65.pdf>  
  
<http://www.webpages.uidaho.edu/~mbolin/samdani-bhatti.htm>  
<http://www.librijournal.org/pdf/1999-4pp236-242.pdf>
- Gupta, D K and Bhardwaj, K (2010) Library Management Research in Indian Universities. Annals of Library and Information Studies. Vol. 57(Dec), p.333-338.  
[http://www.jtaer.com/statistics/download/download.php?co\\_id=JTA20110307](http://www.jtaer.com/statistics/download/download.php?co_id=JTA20110307)
- Higgins, S E(2007) LIS education and research area for developing countries. 5th International CALIBER. Punjab University Chandigarh. 8-10 Feb.



- Jarvelin, K. and P. Vakkari. 1993. The evolution of library and information science 1965-1985: a content analysis of journal articles. *Information Processing and Management*, 29(1): 129-144. <http://archive.ifla.org/VII/s24/pub/iflapr-82-e.pdf>
  
- Joshi Manoj K (2010), Library and information science education in India: Some government initiatives, *DESIDOC journal of library and information technology*, Vol. 30(5), Sept., p 67-73. <http://publications.drdo.gov.in/ojs/index.php/djlit/rt/captureCite/617/0>  
<http://publications.drdo.gov.in/ojs/index.php/djlit/article/download/617/282>  
[http://www.news24online.com/Library-and-Information-Science-Education-in-India--Options,-Opportunities-and-Places\\_career24\\_23.aspx](http://www.news24online.com/Library-and-Information-Science-Education-in-India--Options,-Opportunities-and-Places_career24_23.aspx)
  
- Kumar PSG (1998), Doctoral studies in library and information science in India: A study, *DESIDOC Bulletin of information technology*, vol.18(1), p5-9. <http://ejum.fsktm.um.edu.my/article/262.pdf> <http://lsrj.in/UploadedArticles/110.pdf>
  
- Layzell Ward (1998), Layzell Ward, P. (1997). The nature of UK research literature: Some thoughts arising from a bibliometric study. IFLA General Conference in Copenhagen, 1997. Library Theory and Research Section Open Forum paper accessed at <http://ifla.queenslibrary.org/IV/ifla63/63rocm.htm> accessed on 12.06.2012.  
<http://archive.ifla.org/IV/ifla63/63rocm.htm> <http://archive.ifla.org/VII/s45/news/s45-NL-november04.pdf> <http://www.ifla.org/V/iflaj/jour2601.pdf>  
<http://www.ifla.org.sg/IV/ifla67/papers/018-111e.pdf>  
<http://www.lirg.org.uk/lir/pdf/article83d.pdf>
  
- McNicol; Sarah and Nankivell, Clare (2003) "LIS Researchers and Practitioners: a Research Culture", *Library and Information Research News* 26(83), pp. 10-16  
<http://www.cie.uce.ac.uk/cirt/projects/past/LISlandscape.htm>  
[http://www.cie.uce.ac.uk/cirt/projects/past/LISlandscape\\_final%20report.pdf](http://www.cie.uce.ac.uk/cirt/projects/past/LISlandscape_final%20report.pdf)  
<http://www.lirg.org.uk/lir/pdf/article83d.pdf>
  
- Miwa M et. al. (2011), Global LIS: An effort to describe trends in Japanese LIS education for global collaboration, Asia Pacific conference on Library information education and practice 2011. <http://eprints.uitm.edu.my/view/year/2011.html>
  
- Naukri24 (2012), Library and information science education in India- options, Opportunities and places, Accessed at <http://www.news24online.com/Library-and->

Information-Science-Education-in-India--Options,-Opportunities-and-Places\_career24\_23.aspx accessed on 14.04.2012  
[http://www.news24online.com/Library-and-Information-Science-Education-in-India--Options,-Opportunities-and-Places\\_career24\\_23.aspx](http://www.news24online.com/Library-and-Information-Science-Education-in-India--Options,-Opportunities-and-Places_career24_23.aspx)

- Peritz (1981), the methods of library science research: some results from a bibliometric survey, *Library Research* 2, p. 251-268.  
[http://www.cie.uce.ac.uk/cirt/projects/past/LISlandscape\\_final%20report.pdf](http://www.cie.uce.ac.uk/cirt/projects/past/LISlandscape_final%20report.pdf)
- Pluse, John M., and Prythech, Ray (1996), *Research in Public Libraries, Final Report of the Project on Research in Public Libraries, British Library Research and Innovation Report 8*, London: BLRIC.
- Program: electronic library and information systems, Volume 38, Issue 4 (2006-09-19)
- Rath, P (2010) Information and communication technology - Application in higher education with special reference to north Eastern region. Located at [www.caluniv.ac.in/news/prabhakar.doc](http://www.caluniv.ac.in/news/prabhakar.doc) accessed on 23.07.2011.
- Rana, R. (2011), "Research trends in library and information science in India with a focus on Panjab University, Chandigarh", *International Information and Library Review*,
- Rochester Maxine, and Vakkari, Pertti (1998), "International LIS research: A Comparison of National Trends", *IFLA Journal* 24(3), pp. 166-175.  
<http://archive.ifla.org/VII/s45/news/s45-NL-november04.pdf>
- M. Rochester. (1998), "International LIS Research: A Comparison of National Trends", *IFLA Journal*, <http://archive.ifla.org/VII/s24/pub/iflapr-82-e.pdf>
- Rochester Maxine K (1995), *Library and information science research in Australia 1985-1994. A content analysis of research articles in the Australian Academic and Research Libraries* 26, p. 163-170. <http://archive.ifla.org/VII/s24/pub/iflapr-82-e.pdf>
- Rochester Maxine K and Vakkari Pertti (2003), *International library and information science research: A comparison of national trends, IFLA professional reports, Nr. 82*.  
<http://myais.fsktm.um.edu.my/69/>  
[http://slisweb.sjsu.edu/courses/285.liu/iflapr\\_82\\_e.pdf](http://slisweb.sjsu.edu/courses/285.liu/iflapr_82_e.pdf)

- Samdani R A and Bhatti R (2011), doctoral research in LIS by Pakistani professionals: An analysis, Library philosophy and practice, accessed on <http://inilibunl.edu/lpp> accessed at 25.02.2012.  
<http://lsrj.in/UploadedArticles/110.pdf>  
<http://www.webpages.uidaho.edu/~mbolin/samdani-bhatti.htm>
- Sumsion John (1994) strategic research areas and possible research models for UK public libraries, Library Review, Vol. 43(4), p 7-26.  
<http://www.lirjournal.org.uk/lir/ojs/index.php/lir/article/download/33/16>
- Tsuji Keita, Yoshida Yuko and Miva M (2006) Survey on faculty of Library and Information Science education in Japan, Graduate school of library, Information and Media Studies, University of Tsukuba, 2-3, Kasuga, Tsukuba-shi, Ibaraki 305-8550.  
<http://www.coursehero.com/file/1303196/50BMMeerapp347-352/>
- Uhegbu, A. N. (2011). "Quality library and information science education in Nigeria: The place of public-private collaboration", IFLA Journal,
- Wilson, Concepcion S. Boell, Sebastian K. "Publications of Australian LIS academics in databases.(Report)", Australian Academic & Research Libraries, Sept 2011 Issue

## Chapter 5: Research Trends in LIS: Western Indian Universities

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## Chapter 5: Research Trends in LIS: Western Indian Universities

## ***5.1 Introduction:***

Research in LIS has special importance, as library techniques and practices are changing constantly due to import of technologies in the field to provide proper information support and services to users. The education and research in LIS is progressing everywhere as its scope is increasing and the newer techniques and technologies are being used to find out proper solutions to the problems and also to economize the services using global information. Rath (2010) and Higgins (2007) pointed out that education is one of the largest activities in the world and library supplements to fulfill educational goals and serves as a gateway for academic world by means of providing services to users. The role of LIS education is important in information delivery and since constant changes are witnessed in this area, like growth in literature, changing user needs, and application of technology. In the field of LIS to manage the changes introduced courses at different levels as well as introduced new concepts in curriculum (Graduate and PG programs in LIS). The research activity is also very dynamic in this area, MPhil and PhD courses have been initiated to develop the LIS profession at advanced level to serve the users better.

The history of research in LIS in India is about five decades old and the credit goes to Dr S R Ranganathan. Initially LIS education gained momentum and as stated by Asundi and Karisiddappa (2007) in their article that, in LIS education India ranks within first five nations in output and contribution. The growth in LIS education is mainly due to the efforts of professional bodies like IASLIC, UGC, DRTC, NISCAIR (formerly INSDOC) etc. Later the research activity increased in India in LIS.

## ***5.2: Why Research in LIS:***

The status of LIS education is uplifting continuously and new practices are implemented in the profession due to adaptations of technologies and management techniques. The change is continuous. For the status of librarian positions from master's degree to PhD degree is deserved. Universities are now serving doctoral degree holder for LIS; it is for faculty as well as senior positions in libraries. Wikinson (1983) rightly indicated in his paper that "If librarianship aspires to become a profession, it should depend upon research to develop its knowledge base and its theoretical framework". This statement explains the need of research in LIS. Mahapatra and Sahoo (2004) indicated that there are many problems that libraries and librarianship faces due to constant changes in the profession, and to solve these problems

only research activities could be a useful measure. Further to enhance the human knowledge base and to develop better advanced tools and technique in LIS, research activity helps in attaining such practices. In addition to this PhD level, appears to be a greater significance in any discipline including LIS. Hence the dominant role in LIS profession is played by the LIS researchers. Research is vital as it is a scientific method of enquiry, finding something out, creating new knowledge, going beyond experience and solves the issues.

### ***5.3: Research Trend in Indian Universities:***

The research activity in Indian universities is gathering momentum as there is a greater demand for the research in the discipline. During the recent past, quite a number of research activities have been carried out in the universities and research institutions in various parts of the world. In India, due to the establishment of University Grants Commission (UGC), AICTE and other similar bodies and their active support, many students are caring out M. Phil. and PhD degrees. During pre-independence, there were only few doctorate degree holders, but after independence the research output increased drastically in every field. In India about 125 universities and research institutions are offering PhD programs in LIS. Many researchers made an effort to collect data from different universities and analyzed it to fix the research productivity of the various universities in India (Chandrashekara 2009).

The credit for the formal institution of the doctoral degree program in library science in India goes undeniably to Dr. S.R. Ranganathan (1892–1972). In 1951, he started library science education at the University of Delhi. The University of Delhi awarded the first de jure degree in library science in 1957 to D.B. Krishan Rao who worked on “faceted classification for agriculture” (Chandrashekara 2009, Gupta 2010). Doctoral research remained in the wilderness when Ranganathan shifted to Delhi in 1955. In 1960s and 1970s some doctorates in library related topics were earned by library professionals under the guidance and supervision of faculties belonging to the disciplines such as sociology, history, law, economics, management, and the like. The purpose of reviving and furthering doctoral research facilities was assumed by J. S. Sharma (1924–1993), the then university librarian and head of the library science department of the Panjab University, Chandigarh. Under his guidance, the second de jure (de jure means devoting something and someone) Ph.D. in library science was awarded in 1977 after a gap of two decades. Many universities followed with mostly individual efforts and enthusiasm and doctoral research raised since 1980s and gradual improvement in facilities paved ways for India to maintain its third world leadership

in library research and library literature. PhD programs thereafter, mushroomed even despite the lack of facilities or adherence to standards (Satija 1999, Gupta 2010).

Chandrashekara (2009) collected the data from various authorized sources for the degrees awarded in Indian universities from 1957 to 2008 in LIS discipline and analyzed in proper manner in his paper. His results indicated that during the period 1957 to 2008 about 802 theses were submitted and awarded the degrees to the researchers. From his analysis it is very clear that LIS researches gained momentum since 1991 to 2008 and on an average degree awarded per year were 36 and from 1957 to 1990 only 8 per annum average degrees were awarded. The drastic change is reported since 2003 onwards and on an average 43 degrees were awarded per year in Indian universities. Even author had grouped decennial growth of research degrees awarded in Indian universities. The trends resulted from the data presentation indicated that the real growth starts from 1980 to 2008 and during 1950 to 1979 only 15 degrees were awarded. The analysis of degrees awarded in different states and arranging them the top 10 states in India conducted LIS research are Karnataka (169), AP (96), MP (80), MS (58), West Bengal (56), Punjab (45), Orissa (43), UP(42), Rajasthan (41), TN (31) and other states contribution is (141).

In research activity Karnataka state is leading and Maharashtra ranked at 4<sup>th</sup> position. The analysis made by Chandrashekara and Ramashesh (2009) regarding the research conducted in India during the period 1957-2008 also lists top 10 subjects detailed in

| <b>Sr. No.</b> | <b>Rank</b> | <b>Subject Heading</b>                     | <b>Number of PhD. Theses</b> | <b>Percentage N=802</b> |
|----------------|-------------|--|------------------------------|-------------------------|
| 1.             | 1           | Bibliometrics/ Scientometrics/ Infometrics | 85                           | 10.60                   |
| 2.             | 2           | Library Management                         | 68                           | 8.48                    |
| 3.             | 3           | University Libraries                       | 47                           | 5.86                    |
| 4.             | 4           | Information Systems                        | 31                           | 3.86                    |
| 5.             | 4           | Information Seeking Behavior               | 31                           | 3.86                    |
| 6.             | 5           | Library and Information Services           | 30                           | 3.74                    |

|     |    |                                 |    |      |
|-----|----|---------------------------------|----|------|
|     |    |                                 |    |      |
| 7.  | 6  | Information Technology          | 25 | 3.12 |
| 8.  | 6  | Information Use/User Studies    | 25 | 3.12 |
| 9.  | 6  | Resource Sharing and Networking | 25 | 3.12 |
| 10. | 7  | Library Profession              | 24 | 2.99 |
| 11. | 7  | Public Libraries                | 26 | 3.24 |
| 12. | 8  | College Libraries               | 22 | 2.74 |
| 13. | 9  | Reference/ Information Sources  | 20 | 2.49 |
| 14. | 10 | Special Libraries               | 17 | 2.12 |
| 15. | 10 | LIS Education                   | 17 | 2.12 |

*Table 5.1: Top 10 Subject areas of research in LIS in India (1957-2008)*

*(Source:- Chandrashekara and Ramashesh (2009))*

More than 50% research (493 degrees) in Indian universities was conducted in ten areas and covers the topics like bibliometric studies, library management, university libraries and information services etc. Information seeking behaviour, resource sharing, public and college libraries, and special libraries and LIS education were on the next level of prominent research. Research in the application of ICT was beginning since 2003 and this was new area. This clearly states the focus of research was related to the trends in LIS activities. But many new areas of research were unattended.

The authors have analyzed the contribution of research guides and it was found that Dr C R Karisiddappa stands at first rank guiding to 33 PhD students and degrees were awarded under his auspicious guidance. The next ranked guides are Dr Sangam (21), Dr Gunjal (17), Dr PSG Kumar (17), Dr B Ramesh Babu (17), Dr M R Kumbhar (15), Dr Talwar (13) and Dr Srinath (13) as on 2008.

Gupta and Bharadwaj (2010), Patra and Chand (2006, 2009), Garg et.al (2009), Mahapatra and Sahoo (2004), Kumar (1998) also made different studies to analyze the trends in LIS research in India. The data collected by them focusing different angles was analyzed and narrated the trend of LIS research development. The data collected was analyzed by these authors and interpreted by chronological (year wise) growth, decade wise growth, state wise



distribution, university wise distribution, subject distribution, guide ranking, authorship pattern of citations, language wise distribution of citations etc.

#### ***5.4. Research Trends at Western Indian Universities:***

The researcher collected the data of research output from the different universities located in the western part of India. In western part of India mainly three states are covered i.e. Maharashtra, Gujrat and Goa. All the 21 non-agricultural universities in these states are analyzed and found that the research trends in this area and its growth has been found proliferating. The universities and research output carried out in western part of India 2010 is elaborated in table no. 5.2

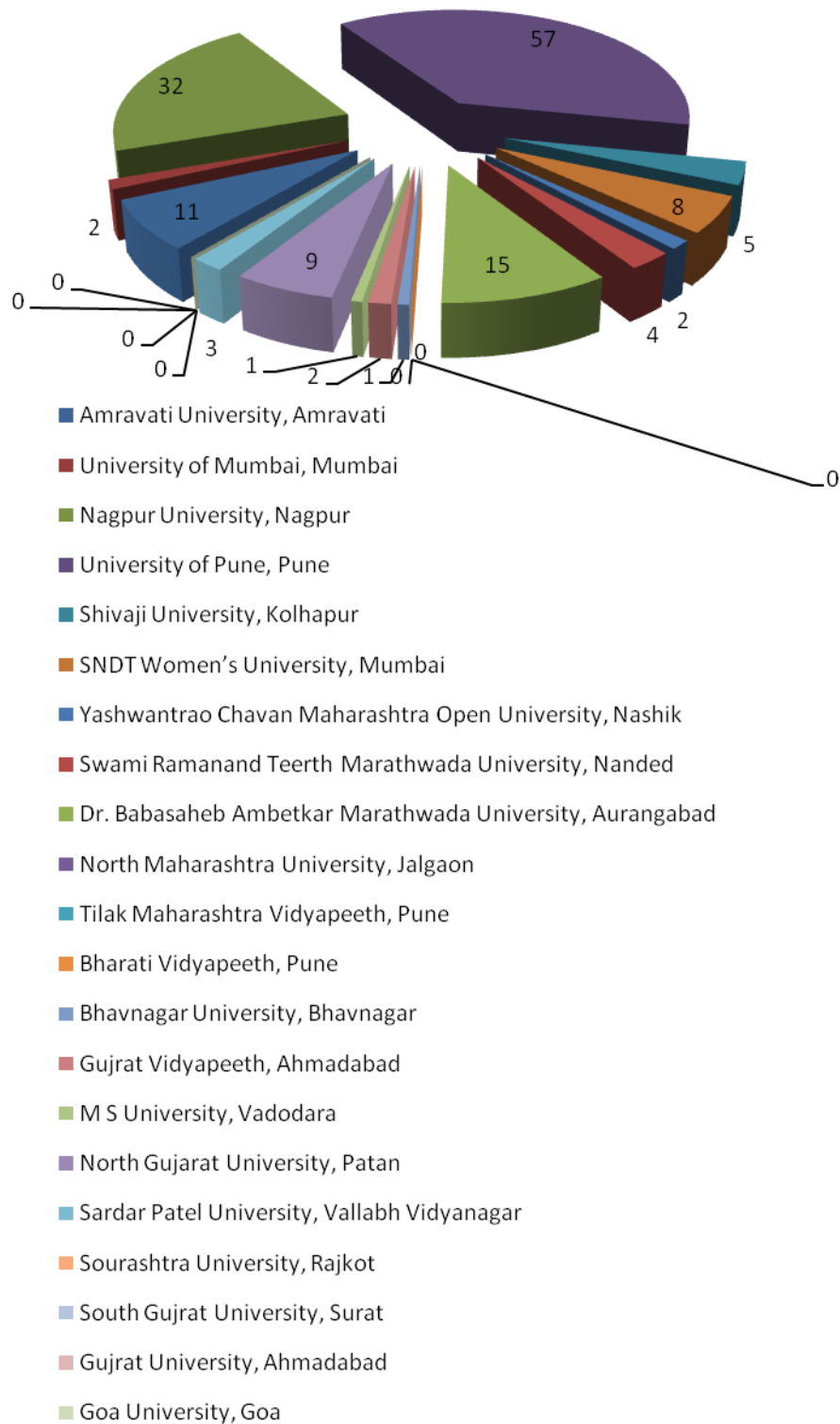
| Sr. No. | State | University   | Degrees Awarded (2010) |
|---------|-------|--|------------------------|
| 1       | MS    | Amravati University, Amravati                            | 11                     |
| 2       | MS    | University of Mumbai, Mumbai                             | 02                     |
| 3       | MS    | Nagpur University, Nagpur                                | 32                     |
| 4       | MS    | University of Pune, Pune                                 | 57                     |
| 5       | MS    | Shivaji University, Kolhapur                             | 05                     |
| 6       | MS    | SNDT Women's University, Mumbai                          | 08                     |
| 7       | MS    | Yashwantrao Chavan Maharashtra Open University, Nashik   | 02                     |
| 8       | MS    | Swami Ramanand Teerth Marathwada University, Nanded      | 04                     |
| 9       | MS    | Dr. Babasaheb Ambedkar Marathwada University, Aurangabad | 15                     |
| 10      | MS    | North Maharashtra University, Jalgaon                    | 00                     |

|    |     |   |     |
|----|-----|---|-----|
| 11 | MS  | Tilak Maharashtra Vidyapeeth, Pune          | 00  |
| 12 | MS  | Bharati Vidyapeeth, Pune                    | 00  |
| 13 | Guj | Bhavnagar University, Bhavnagar             | 01  |
| 14 | Guj | Gujrat Vidyapeeth, Ahmadabad                | 02  |
| 15 | Guj | M S University, Vadodara                    | 01  |
| 16 | Guj | North Gujarat University, Patan             | 09  |
| 17 | Guj | Sardar Patel University, Vallabh Vidyanagar | 03  |
| 18 | Guj | Sourashtra University, Rajkot               | 00  |
| 19 | Guj | South Gujarat University, Surat             | 00  |
| 20 | Guj | Gujrat University, Ahmadabad                | 00  |
| 21 | Goa | Goa University, Goa                         | 00  |
|    |     | Total Degrees Awarded                       | 152 |

*Table 5.2 Status of research in LIS from Western part of Indian Universities*

*Note: Maharashtra (MS), Gujrat (Guj)*

*Status of research in LIS from Western part of Indian Universities*



*Figure 5.1 Status of research in LIS from Western part of Indian Universities*

*Note: Maharashtra (MS), Gujrat (Guj)*

**Observation:-** The researcher from the collected data found that from 21 universities are 14 universities conducting the research programs and 7 universities are conducting only LIS education up to degree level i.e. BLIS and MLIS courses and initiated recently research programs like MPhil and PhD. In the remaining 7 universities degrees are not awarded during the study period. (North Maharashtra University Jalgaon, Tilak Maharashtra Vidyapeeth Pune, Bharati Vidyapeeth Pune, Sourashtra university, Rajkot, south Gujrat university Surat, Gujrat University, Ahmadabad, and Goa University, Goa.). But in universities in the mean time awarded few degrees like Bharati Vidyapeeth, TMV but not before 2010. The ranking of universities is detailed in table 5.3

#### **5.4.1 Ranking of PhD Degrees Awarded by Universities.**

| Sr. No. | State | Name of University                                       | Degrees Awarded (2010) |
|---------|-------|--|------------------------|
| 1       | MS    | University of Pune, Pune                                 | 57                     |
| 2       | MS    | Nagpur University, Nagpur                                | 32                     |
| 3       | MS    | Dr. Babasaheb Ambedkar Marathwada University, Aurangabad | 15                     |
| 4       | MS    | Amravati University, Amravati                            | 11                     |
| 5       | Guj   | North Gujarat University, Patan                          | 9                      |
| 6       | MS    | SNDT Women's University, Mumbai                          | 8                      |
| 7       | MS    | Shivaji University, Kolhapur                             | 5                      |
| 8       | MS    | Swami Ramanand Teerth Marathwada University, Nanded      | 4                      |
| 9       | Guj   | Sardar Patel University, Vallabh Vidyanagar              | 3                      |
| 10      | MS    | University of Mumbai, Mumbai                             | 2                      |
| 11      | MS    | Yashwantrao Chavan Maharashtra Open University, Nashik   | 2                      |
| 12      | Guj   | Gujrat Vidyapeeth, Ahmadabad                             | 2                      |
| 13      | Guj   | Bhavnagar University, Bhavnagar                          | 1                      |
| 14      | Guj   | M S University, Vadodara                                 | 1                      |

|    |     |                                       |     |
|----|-----|---------------------------------------|-----|
| 15 | MS  | North Maharashtra University, Jalgaon | 0   |
| 16 | MS  | Tilak Maharashtra Vidyapeeth, Pune    | 0   |
| 17 | MS  | Bharati Vidyapeeth, Pune              | 0   |
| 18 | Guj | Sourashtra University, Rajkot         | 0   |
| 19 | Guj | South Gujrat University, Surat        | 0   |
| 20 | Guj | Gujrat University, Ahmadabad          | 0   |
| 21 | Goa | Goa University, Goa                   | 0   |
|    |     | Total Degrees Awarded                 | 152 |

*Table 5.3: Ranking status of Research in Universities from Western India*

**Observation:** - From the table it is pointed out that Pune University (MS) stands at rank 1<sup>st</sup> in LIS area and awarded 57 degrees till 2010. The next in hierarchy are Nagpur University (32), BAMU (15) and Amravati University (11). These universities have proved strong base for the research activity. However North Gujrat University (9), SNDT (8) and Shivaji University (5) have shown inclination towards research.

Chandrashekara and Ramasesh (2009) pointed out in their communication listing the progress of research in different states of India and recorded that in India around 802 PhD degrees are awarded till 2008. Among Indian states Maharashtra ranks fourth and other states ranks in order are Karnataka 169 (21.07%), Andhra Pradesh 96 (11.97%), Madhya Pradesh 80 (9.98%), Maharashtra 58 (7.23%), West Bengal 56 (6.98%), Punjab 45 (5.61%), Orissa 43 (5.36%), Uttar Pradesh 42 (5.24%), Rajasthan 41 (5.11), Tamil Nadu 31 (3.87%) and other states 141 (17.58%) etc. while reviewing the status in the western zone of the India it is found that till 2010 in Maharashtra alone 136 theses and in Gujrat 16 theses are accepted for PhD degrees. The only state from this area Goa has not yet started research degree facility and hence no research output has been covered for this state.

#### ***5.4.2 Chronological Distribution of Research activity:***

The chronological research output from western Indian universities are detailed in table no 5.4

| Sr. No. | Year of Award | No. of Degree Awarded | Percentage (%) |
|---------|---------------|-----------------------|----------------|
| 1       | 1986          | 1                     | 0.66           |
| 2       | 1987          | 1                     | 0.66           |
| 3       | 1989          | 1                     | 0.66           |
| 4       | 1990          | 1                     | 0.66           |
| 5       | 1991          | 1                     | 0.66           |
| 6       | 1992          | 3                     | 1.97           |
| 7       | 1993          | 1                     | 0.66           |
| 8       | 1994          | 3                     | 1.97           |
| 9       | 1995          | 2                     | 1.32           |
| 10      | 1996          | 1                     | 0.66           |
| 11      | 1997          | 3                     | 1.97           |
| 12      | 1998          | 6                     | 3.95           |
| 13      | 1999          | 5                     | 3.29           |
| 14      | 2000          | 4                     | 2.63           |
| 15      | 2001          | 4                     | 2.63           |
| 16      | 2002          | 12                    | 7.89           |
| 17      | 2003          | 5                     | 3.29           |
| 18      | 2004          | 17                    | 11.18          |
| 19      | 2005          | 9                     | 5.92           |
| 20      | 2006          | 12                    | 7.89           |
| 21      | 2007          | 17                    | 11.18          |
| 22      | 2008          | 19                    | 12.50          |
| 23      | 2009          | 10                    | 6.58           |

|    |              |            |               |
|----|--------------|------------|---------------|
| 24 | 2010         | 14         | 9.21          |
|    | <b>Total</b> | <b>152</b> | <b>100.00</b> |

*Table 5.4 Chronological growth of PhD theses in LIS (Awarded)*

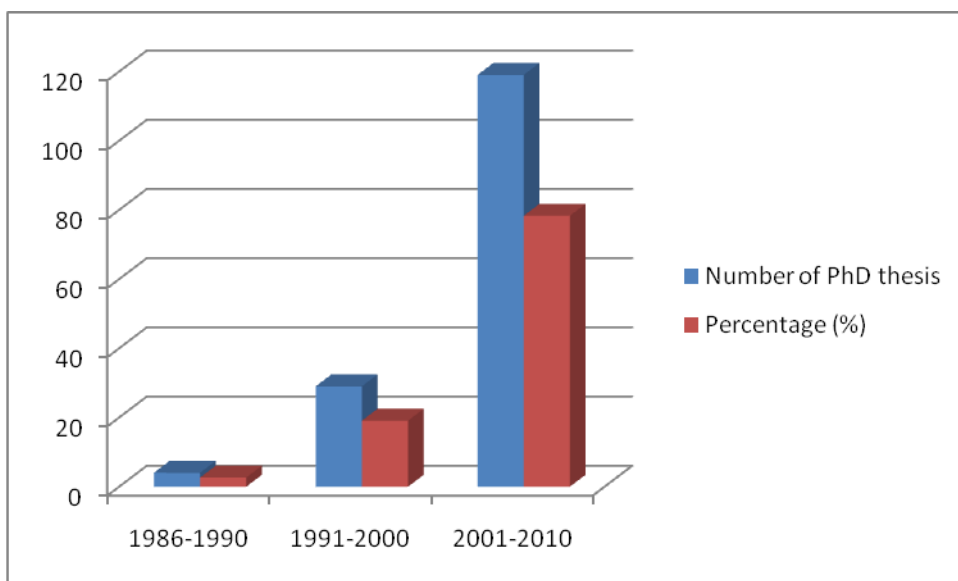
**Observation:** - The table 5.4 depicts the number of doctoral degrees awarded in the field of LIS starting from the year 1986 till 2010. It is very clear from the table that research activity was quite rare till 2001 and all of a sudden, the research productivity increased from 2002 onwards. One of the reasons for this rise is the need and emphasis on recruiting qualified faculty and librarians mainly in the universities and technological institutions having research degree. It was true fact that UGC started giving preference to the candidates who have done research in LIS. At present on an average 6 doctoral thesis are being awarded PhD degrees every year from this zone. During the period 2002 to 2010 an average of 12 thesis were awarded doctoral degrees. From this it is clear that there is an increase in research output in LIS starting from 2002 in this zone.

#### **5.4.3 Decade wise Growth of Research Activity:**

The table 5.5 depicts the decade wise distribution of PhD thesis in Western Indian Universities (Maharashtra, Gujrat and Goa).

| <b>Sr. No.</b> | <b>Decades</b> | <b>Number of PhD thesis</b> | <b>Percentage (%)</b> |
|----------------|----------------|-----------------------------|-----------------------|
| 1              | 1986-1990      | 4                           | 2.63                  |
| 2              | 1991-2000      | 29                          | 19.08                 |
| 3              | 2001-2010      | 119                         | 78.29                 |
|                | <b>Total</b>   | <b>152</b>                  | <b>100</b>            |

*Table 5.5: Decade wise growth of LIS Research (Degrees Awarded)*



*Figure 5.2: Decade wise distribution of Research activity.*

**Observation:-** It is observed that there is quite a number of PhD degrees produced after 1991. Further it is evident from the table that 78.29% of the research output was contributed during the period 2001-2010. Yet another 19.08% of the research output was made during the previous decade i.e. 1991-2000. From this it is evident that more than 78.29% of the PhD degrees were awarded during the period 2001-2010. It is worth mentioning here at this juncture that only 21.71% research output contributed in 1986-2000 (almost 14 years). However, it can be concluded from this data that a majority of quality research output is observed during the last decade (11 years).

#### **5.4.4 State wise Distribution of Research Activity:**

Tables 5.6 elaborate the state wise growth of PhD research activity.

| State        | No. of Degrees | Percentage (%) |
|--------------|----------------|----------------|
| Gujrat       | 16             | 10.52          |
| Maharashtra  | 136            | 89.47          |
| Goa          | 00             | 00             |
| <b>Total</b> | <b>152</b>     | <b>100</b>     |

*Table 5.6: State wise distribution of PhD Research (Awarded)*

**Observation:** From the table 5.6 it is observed that Maharashtra state is prominent in research among all the three states and followed by Gujrat. The Goa state has not initiated the research



program and no research output is seen from this state. In MS research activity was initiated from 1986 onwards and till 2010 nearly 136 PhD degrees were awarded. Where is in Gujrat state the research activity initiated since 2000 onwards (14 years later than MS) and 16 PhD degrees were awarded. From base year 2000 onwards Gujrat awarded 16 degrees where as MS awarded 103 degrees. This clearly indicated MS is at leading position in research activity in this zone.

#### ***5.4.5: Subject Analysis of PhD Research Topics:***

| <b>Sr. No.</b> | <b>Subject covered (1986-2010)</b>  | <b>Number of thesis</b> | <b>Ranking</b> | <b>Percentage (%)</b> |
|----------------|-------------------------------------|-------------------------|----------------|-----------------------|
| 1              | Academic Libraries                  | 39                      | 1              | 25.66                 |
| 2              | Reference and Information services  | 14                      | 2              | 9.21                  |
| 3              | Special Library                     | 13                      | 3              | 8.55                  |
| 4              | Information Seeking behaviour       | 10                      | 4              | 6.58                  |
| 5              | Bibliometrics and Citation Analysis | 9                       | 5              | 5.92                  |
| 6              | Public Library                      | 9                       | 5              | 5.92                  |
| 7              | ICT                                 | 5                       | 6              | 3.29                  |
| 8              | Library Networks                    | 5                       | 6              | 3.29                  |
| 9              | Library Education and Curriculum    | 4                       | 7              | 2.63                  |
| 10             | Cataloguing                         | 3                       | 8              | 1.97                  |
| 11             | Internet                            | 3                       | 8              | 1.97                  |
| 12             | Library Management                  | 3                       | 8              | 1.97                  |
| 13             | Classification                      | 2                       | 9              | 1.32                  |
| 14             | Digital Library                     | 2                       | 9              | 1.32                  |
| 15             | Digitization                        | 2                       | 9              | 1.32                  |
| 16             | Grey literature                     | 2                       | 9              | 1.32                  |
| 17             | Information System                  | 2                       | 9              | 1.32                  |
| 18             | Librarianship                       | 2                       | 9              | 1.32                  |

|    |                          |            |    |            |
|----|--------------------------|------------|----|------------|
| 19 | Library Legislation      | 2          | 9  | 1.32       |
| 20 | Patent literature        | 2          | 9  | 1.32       |
| 21 | Standards                | 2          | 9  | 1.32       |
| 22 | Use study: e-journal     | 2          | 9  | 1.32       |
| 23 | Vocabulary Control       | 2          | 9  | 1.32       |
| 24 | Web tools                | 2          | 9  | 1.32       |
| 25 | Abstracting and Indexing | 1          | 10 | 0.66       |
| 26 | Bibliographic databases  | 1          | 10 | 0.66       |
| 27 | Case study of Libraries  | 1          | 10 | 0.66       |
| 28 | Content Management       | 1          | 10 | 0.66       |
| 29 | Geographic Information   | 1          | 10 | 0.66       |
| 30 | HRD                      | 1          | 10 | 0.66       |
| 31 | Knowledge Management     | 1          | 10 | 0.66       |
| 32 | Library Association      | 1          | 10 | 0.66       |
| 33 | Manuscripts              | 1          | 10 | 0.66       |
| 34 | Staffing Pattern         | 1          | 10 | 0.66       |
| 35 | Subject heading          | 1          | 10 | 0.66       |
|    | <b>Total</b>             | <b>152</b> |    | <b>100</b> |

*Table 5.7: Ranking of subject distribution of PhD theses (awarded).*

**Observation:** from the study it is revealed that the research activity was more in the following areas.

|   |                                     |
|---|-------------------------------------|
| 1 | Academic Libraries                  |
| 2 | Reference and Information services  |
| 3 | Special Library                     |
| 4 | Information Seeking behaviour       |
| 5 | Bibliometrics and Citation Analysis |

|   |                |
|---|----------------|
| 6 | Public Library |
|---|----------------|

Table 5.7.1: Ranking of Research Topics.

The next priority was given to subject areas

|                                  |   |
|----------------------------------|---|
| ICT                              | 5 |
| Library Networks                 | 5 |
| Library Education and Curriculum | 4 |

Table 5.7.2: Priority in Subject Areas

On comparing this with Indian research productivity ICT, Library Networks and LIS education has influenced more in this area.

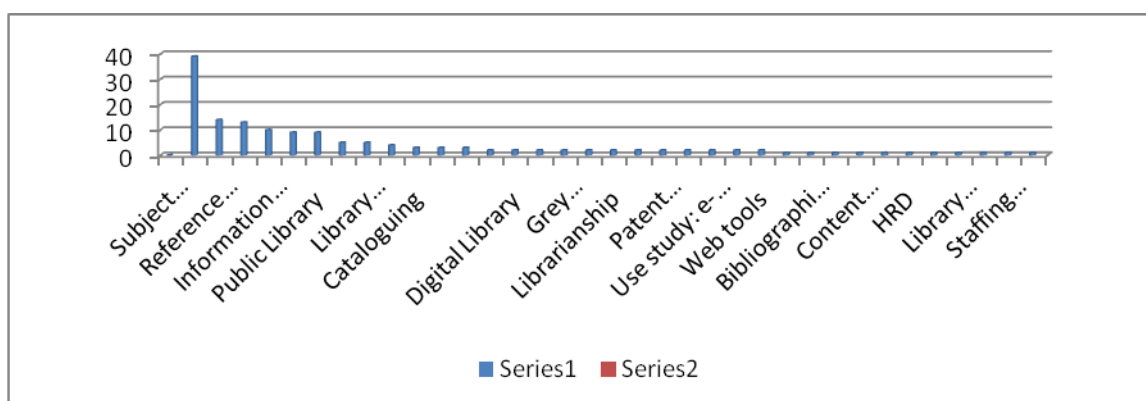


Figure 5.3: Subject wise analysis of PhD research topics

#### 5.4.6: Ranking of Guides:

37 research guides assisted in guiding research studied in this zone. The ranking is provided in following table.

| Sr. No | Research Guide | No of Degrees | Ranking | Percentage (%) |
|--------|----------------|---------------|---------|----------------|
| 1      | Kumar P S G    | 31            | 1       | 20.39          |
| 2      | Rajyalakshmi D | 11            | 2       | 7.24           |
| 3      | Deshpande N J  | 10            | 3       | 6.58           |
| 4      | Charan S M     | 9             | 4       | 5.92           |
| 5      | Patil S K      | 9             | 4       | 5.92           |

|    |                        |   |    |      |
|----|------------------------|---|----|------|
| 6  | Konnur M B             | 8 | 4  | 5.26 |
| 7  | Ganpule S R            | 7 | 5  | 4.61 |
| 8  | Mahajan S G            | 6 | 6  | 3.95 |
| 9  | Prasad A R D           | 6 | 6  | 3.95 |
| 10 | Riswadkar M R          | 5 | 7  | 3.29 |
| 11 | Deshpande D R          | 4 | 8  | 2.63 |
| 12 | Parekh Harsha          | 4 | 8  | 2.63 |
| 13 | Satarkar S P           | 4 | 8  | 2.63 |
| 14 | Singh Surya Nath       | 4 | 8  | 2.63 |
| 15 | Vaishnav A A           | 4 | 8  | 2.63 |
| 16 | Mohal S M              | 3 | 9  | 1.97 |
| 17 | Vyas Krit M            | 3 | 9  | 1.97 |
| 18 | Gunjal S R             | 2 | 10 | 1.32 |
| 19 | Kamath V A             | 2 | 10 | 1.32 |
| 20 | Karisiddappa C R       | 2 | 10 | 1.32 |
| 21 | Rao J K<br>Ravichandra | 2 | 10 | 1.32 |
| 22 | Anderson B             | 1 | 11 | 0.66 |
| 23 | Bapat N G              | 1 | 11 | 0.66 |
| 24 | Bhagawatkar V M        | 1 | 11 | 0.66 |
| 25 | Biyani Pramod          | 1 | 11 | 0.66 |
| 26 | Gokhale Pratibha A     | 1 | 11 | 0.66 |
| 27 | Konnur P V             | 1 | 11 | 0.66 |
| 28 | Lomte S S              | 1 | 11 | 0.66 |
| 29 | Mishra<br>Shivshankar  | 1 | 11 | 0.66 |
| 30 | Nahle U P              | 1 | 11 | 0.66 |

|    |                  |            |    |               |
|----|------------------|------------|----|---------------|
| 31 | Naidu M K R      | 1          | 11 | 0.66          |
| 32 | Raval C N        | 1          | 11 | 0.66          |
| 33 | Rawal C N        | 1          | 11 | 0.66          |
| 34 | Sen Bharati      | 1          | 11 | 0.66          |
| 35 | Sengupta Shivani | 1          | 11 | 0.66          |
| 36 | Shukla K H       | 1          | 11 | 0.66          |
| 37 | Wadikar S A      | 1          | 11 | 0.66          |
|    |                  | <b>152</b> |    | <b>100.00</b> |

*Table 5.8 Ranking of Guides (Awarded)*

**Observation:** From the above table it is observed that Dr PSG Kumar Ranked first and had 31 successful candidates, followed by Dr Mrs. Rajyalakshmi D with 11 candidates and Dr Mrs N J Deshpande having 10 completed research candidates at their credit. 37 research guides successfully completed 152 research topics till 2010-11. From Maharashtra Dr PSG Kumar is rank one and is also competing to national ranking at third position.

|                |    |   |       |
|----------------|----|---|-------|
| Kumar P S G    | 31 | 1 | 20.39 |
| Rajyalakshmi D | 11 | 2 | 7.24  |
| Deshpande N J  | 10 | 3 | 6.58  |

*5.8.1: Ranking of Top 3 Guides.*

The next in rank line are:

|               |   |   |      |
|---------------|---|---|------|
| Charan S M    | 9 | 4 | 5.92 |
| Patil S K     | 9 | 4 | 5.92 |
| Konnur M B    | 8 | 4 | 5.26 |
| Ganpule S R   | 7 | 5 | 4.61 |
| Mahajan S G   | 6 | 6 | 3.95 |
| Prasad A R D  | 6 | 6 | 3.95 |
| Riswadkar M R | 5 | 7 | 3.29 |

*5.8.2: Ranking of Guide*

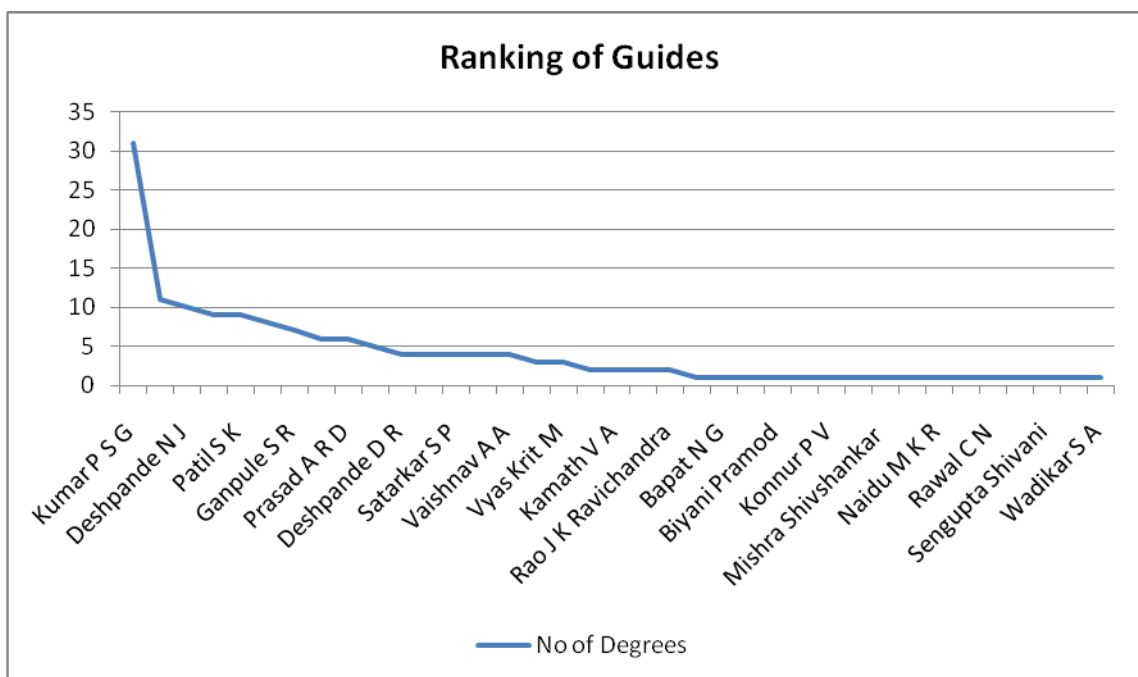


Figure 5.4: Ranking of Guides

#### 5.4.7: University wise Statistics of First PhD Degree Awarded.

| Sr. No. | Research Student    | Date of Award | Name of University                              | State       |
|---------|---------------------|---------------|---|-------------|
| 1       | Vaishnav A A        | 1994          | BAM University, Aurangabad                      | Maharashtra |
| 2       | Gohel Batuk M       | 2005          | Bhavnagar University, Bhavnagar                 | Gujrat      |
| 3       | Kureshi Nazima U    | 2003          | Gujarat Vidyapeeth, Ahamadabad                  | Gujrat      |
| 4       | Patel Chandrakant   | 2002          | Hemchandracharya North Gujrat University, Patan | Gujrat      |
| 5       | Patel Yogeshkumar   | 2002          | Hemchandracharya North Gujrat University, Patan | Gujrat      |
| 6       | Patel Ghanshyamlal  | 2002          | Hemchandracharya North Gujrat University, Patan | Gujrat      |
| 7       | Pandya V C          | 2002          | Hemchandracharya North Gujrat University, Patan | Gujrat      |
| 8       | Pradhan Sanghamitra | 2008          | M S University, Vadodara                        | Gujrat      |

|    |                          |      |                                      |             |
|----|--------------------------|------|--------------------------------------|-------------|
| 9  | Rajyalakshmi D           | 1992 | Nagpur University,<br>Nagpur         | Maharashtra |
| 10 | Gajway P. M.             | 2001 | SGBA University,<br>Amravati         | Maharashtra |
| 11 | Deshmukh P. P.           | 2001 | SGBA University,<br>Amravati         | Maharashtra |
| 12 | Abbas Khan A A           | 1999 | Shivaji University,<br>Kolhapur      | Maharashtra |
| 13 | Marolia Perin V          | 1996 | SNDT University,<br>Mumbai           | Maharashtra |
| 14 | Bhavsar<br>Vaishaliben L | 2000 | SP University, Vallabh<br>Vidyanagar | Gujrat      |
| 15 | Mundhe Baliram           | 2004 | SRTM University,<br>Nanded           | Maharashtra |
| 16 | Gokhale Pratibha A       | 2000 | University of Mumbai                 | Maharashtra |
| 17 | Konnur M B               | 1986 | University of Pune                   | Maharashtra |
| 18 | Choure A A               | 2006 | YCMO University,<br>Nashik           | Maharashtra |
| 19 | Sewale Madhukar N        | 2006 | YCMO University,<br>Nashik           | Maharashtra |

*Table 5.9: First Research Scholars from Different Universities*

**Observation:** Among all these research scholars Dr M B Konnur from Maharashtra was the first Librarian who honoured with PhD in 1986 and followed by others, similarly from Gujrat Dr Bhavsar Vaishaliben was the first PhD degree awardees in 2000.

#### ***5.4.8 Comparison of Degree Awarded and Ongoing Research Activity in LIS:***

The researcher has also reviewed ongoing research activities in LIS carried out in universities and data made available from the universities to researcher was analyzed the trends of ongoing research trends in LIS in this zone. The trend of research

Completed and ongoing was evaluated and also compared to find the emerging areas. During the past few years the data analysis indicated that 136 topics are selected by researcher students. The ongoing research is compared with completed studies and analyzed in the following table.

| <b>Sr. No.</b> | <b>Ongoing Subject</b>              | <b>Number of PhD</b> | <b>Awarded Subject</b>              | <b>Number of PhD</b> |
|----------------|-------------------------------------|----------------------|-------------------------------------|----------------------|
| 1              | Special Libraries                   | 33                   | Academic Libraries                  | 39                   |
| 2              | Academic Library                    | 29                   | Reference and Information services  | 14                   |
| 3              | Bibliometrics and Citation Analysis | 9                    | Special Library                     | 13                   |
| 4              | Public Libraries                    | 7                    | Information Seeking behaviour       | 10                   |
| 5              | Information Seeking behaviour       | 5                    | Bibliometrics and Citation Analysis | 9                    |
| 6              | Bibliographic Databases             | 4                    | Public Library                      | 9                    |
| 7              | Open Access Initiative              | 4                    | ICT                                 | 5                    |
| 8              | Information Literacy                | 3                    | Library Networks                    | 5                    |
| 9              | LIS Education                       | 3                    | Library Education and Curriculum    | 4                    |
| 10             | Resources Sharing                   | 3                    | Cataloguing                         | 3                    |
| 11             | Classification                      | 2                    | Internet                            | 3                    |
| 12             | Content Analysis                    | 2                    | Library Management                  | 3                    |
| 13             | e-resources                         | 2                    | Classification                      | 2                    |
| 14             | Information Centres                 | 2                    | Digital Library                     | 2                    |
| 15             | Information Retrieval system        | 2                    | Digitization                        | 2                    |
| 16             | IPR                                 | 2                    | Grey literature                     | 2                    |
| 17             | Library Network                     | 2                    | Information System                  | 2                    |
| 18             | Metadata                            | 2                    | Librarianship                       | 2                    |
| 19             | Digital Divide                      | 1                    | Library Legislation                 | 2                    |
| 20             | Digital Library                     | 1                    | Patent literature                   | 2                    |
| 21             | Digitization                        | 1                    | Standards                           | 2                    |
| 22             | ICT                                 | 1                    | Use study: e-journal                | 2                    |
| 23             | Information Gateway                 | 1                    | Vocabulary Control                  | 2                    |
| 24             | Information services                | 1                    | Web tools                           | 2                    |
| 25             | Internet                            | 1                    | Abstracting and Indexing            | 1                    |



|    |                             |            |                         |            |
|----|-----------------------------|------------|-------------------------|------------|
| 26 | Knowledge Management        | 1          | Bibliographic databases | 1          |
| 27 | Library Automation          | 1          | Case study of Libraries | 1          |
| 28 | Library Services            | 1          | Content Management      | 1          |
| 29 | Library Software            | 1          | Geographic Information  | 1          |
| 30 | Library Building            | 1          | HRD                     | 1          |
| 31 | Online Information Services | 1          | Knowledge Management    | 1          |
| 32 | Staff Pattern               | 1          | Library Association     | 1          |
| 33 | Thesaurus                   | 1          | Manuscripts             | 1          |
| 34 | Traditional Knowledge       | 1          | Staffing Pattern        | 1          |
| 35 | LIS Trends                  | 1          | Subject heading         | 1          |
| 36 | User Education              | 1          |                         |            |
| 37 | Web Technology              | 1          |                         |            |
| 38 | Use Study Literature        | 1          |                         |            |
|    |                             | <b>136</b> |                         | <b>152</b> |

*Table 5.10 Comparison of Degree awarded Research and Ongoing Research*

**Observation:** From the above comparison it is concluded that topics which are common at both level are academic libraries, bibliographic databases, bibliometrics and citation analysis, classification, digital library, ICT applications, information seeking behaviour, internet, LIS education, library networks, and public library, staffing pattern and web technology. It is found that research was more popular in traditional library concepts earlier and slowly due to ICT applications new areas are visualized in research like library networks, DL, Internet, web technology etc at ongoing literature.

#### **5.4.9: Research guide Analysis (Ongoing)**

For completing 136 ongoing research topics 29 guides are engaged. The analysis (Ranking) is in following table.

| Sr. No. | Research Guide (ongoing) | Students | Rank | Percentage (%) |
|---------|--------------------------|----------|------|----------------|
| 1.      | Dakhole Pramod S.        | 10       | 1    | 7.35           |
| 2.      | Deshpande R M            | 10       | 1    | 7.35           |

|     |                     |    |    |      |
|-----|---------------------|----|----|------|
| 3.  | Kale Kishore B.     | 10 | 1  | 7.35 |
| 4.  | Rajyalakshmi D      | 9  | 2  | 6.62 |
| 5.  | Kumar P S G         | 8  | 3  | 5.88 |
| 6.  | Dahibhate N. B.     | 7  | 4  | 5.15 |
| 7.  | Hirwade Mangala A.  | 7  | 4  | 5.15 |
| 8.  | Khot Namita         | 7  | 4  | 5.15 |
| 9.  | Nikose Satyaprakash | 7  | 4  | 5.15 |
| 10. | Deshpande D R       | 6  | 5  | 4.41 |
| 11. | Deshpande N J       | 6  | 5  | 4.41 |
| 12. | Nahle U P           | 6  | 5  | 4.41 |
| 13. | Konnur M. B.        | 5  | 6  | 3.68 |
| 14. | Prashad A R D       | 5  | 6  | 3.68 |
| 15. | Satarkar S P        | 5  | 6  | 3.68 |
| 16. | Paradkar Aswini P.  | 4  | 7  | 2.94 |
| 17. | Kherade M R         | 3  | 8  | 2.21 |
| 18. | Panage B. M.        | 3  | 8  | 2.21 |
| 19. | Rajaram Shyama      | 3  | 8  | 2.21 |
| 20. | Chowkhande V        | 2  | 9  | 1.47 |
| 21. | Patil S K           | 2  | 9  | 1.47 |
| 22. | Patil Y M           | 2  | 9  | 1.47 |
| 23. | Rajendra A. R.      | 2  | 9  | 1.47 |
| 24. | Singh Surya Nath    | 2  | 9  | 1.47 |
| 25. | Ajay M. Pandit      | 1  | 10 | 0.74 |
| 26. | Bansode S Y         | 1  | 10 | 0.74 |
| 27. | Kumbhar R M         | 1  | 10 | 0.74 |
| 28. | Shukla K H          | 1  | 10 | 0.74 |

|     |                   |     |    |        |
|-----|-------------------|-----|----|--------|
| 29. | Nagarkar Shubhada | 1   | 10 | 0.74   |
|     |                   | 136 |    | 100.00 |

*Table 5.11 Ranking of Guides (Ongoing) (as on 2008-09)*

**Observation:** 136 research students are registered for the PhD and 29 guides are managing LIS research. From the table the ranking of the research guides as under and it is also observed that many new guides appointed by the different universities.

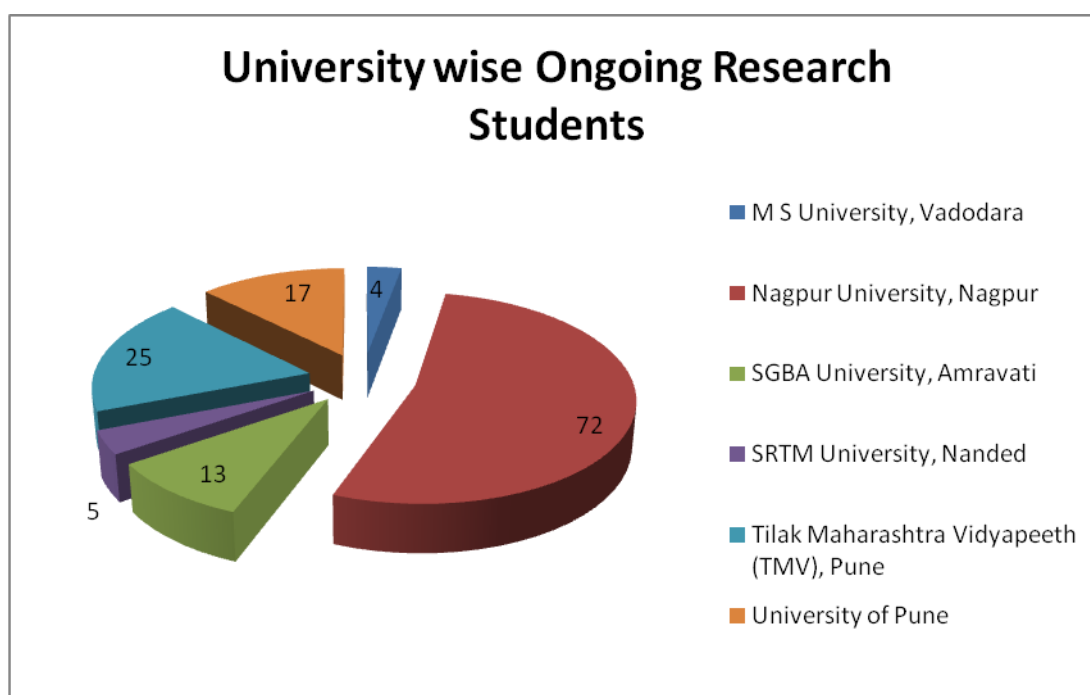
|                     |    |
|---------------------|----|
| Dakhole Pramod S.   | 10 |
| Deshpande R M       | 10 |
| Kale Kishore B.     | 10 |
| Rajyalakshmi D      | 9  |
| Kumar P S G         | 8  |
| Dahibhate N. B.     | 7  |
| Hirwade Mangala A.  | 7  |
| Khot Namita         | 7  |
| Nikose Satyaprakash | 7  |
| Deshpande D R       | 6  |
| Deshpande N J       | 6  |
| Nahle U P           | 6  |
| Konnur M. B.        | 5  |
| Prashad A R D       | 5  |
| Satarkar S P        | 5  |

**5.4.10: University wise Ongoing Research:**

| University               | ongoing research student |
|--------------------------|--------------------------|
| M S University, Vadodara | 4                        |

|  |     |
|--|-----|
| Nagpur University, Nagpur                | 72  |
| SGBA University, Amravati                | 13  |
| SRTM University, Nanded                  | 5   |
| Tilak Maharashtra Vidyapeeth (TMV), Pune | 25  |
| University of Pune                       | 17  |
|  | 136 |

*Table 5.12 University wise Ongoing Research Student*



*Figure 5.5: University wise Ongoing Research Students*

**Observation:** out of 136 students maximum registrations are from Nagpur University (72 candidates registered for research), followed by TMV Pune (25), and Pune University (17). It is observed that Pune University and Nagpur University are more productive universities in Maharashtra. The research guides are not sufficient to take the load as UGC has fixed the limit of 8 candidates per guide and hence there is a need to include more guides in the universities. The situation at Gujrat is not provided properly and have not analyzed.

From the analytical study of the research development in Indian universities in western part, LIS research is showing continuous improvement as number of doctoral degrees awarded by all Indian universities is increasing over the years. Significant development has been observed since 2001. It is found that 80% of Indian universities are offering LIS research education have produced doctoral students. Though 80 universities engaged in LIS Research in India, half of them have produced less than five PhDs in the past two and half decades. Further, it is observed that the universities in Southern India have produced more doctoral students as compare to universities in Northern India. The associations or government bodies can look at this issue more closely. It is to be noted that about 15% of LIS schools in India have produced more than 20 PhDs in the past two and half decades. The number is varying from 22 to 67 PhDs. About 5% of research supervisors have produced more than 10 doctoral students. The number is varying from 10-23 supervisors. More than half the LIS research supervisors have produced just one doctoral student. As per University norms, a supervisor can supervise maximum 8 students in all. The authors opine that the supervisors, universities and LIS associations should take interest to access the current status and devise correct measures for improving the productivity and quality of the research. The subject areas like bibliographic/literature study, user studies, library automation/IT application, library management, HRD/personnel growth and development and library profession/librarianship etc are most favoured subjects with more than 50 doctoral dissertations. Karnataka, Madhya Pradesh, Andhra Pradesh, Uttar Pradesh and Maharashtra are the top performing Indian states producing over more PhDs in LIS so far.

### ***Summary:***

Research and development is the index of prosperity of the nation. The LIS research in India is dragging the attention of LIS researchers. The number of researchers registering for doctoral research is increasing over the years. Though the output is increasing over the years, the productivity of individual universities is not very encouraging. There could be several factors contributing this situation. It is high time that the universities and research supervisors take stock of current status of research and initiate corrective measures to improve the productivity of qualitative research. In the era of internet, the ICT supported and professionally related subject areas call for the attention of LIS researchers and research in those areas may definitely contribute to the growth of knowledge and country.

The researcher observed that LIS research has been conducted considering different types of libraries such as academic, special, R&D and public libraries. The specific category of libraries covered in LIS research are academic, special, public, agriculture, industrial libraries in that order of research output. Oriental and government libraries are also being studied by LIS researchers. Among the academic libraries, university libraries are most studied libraries followed by health science, technical and college libraries. The next important segment of libraries covered is public libraries, among special libraries, half of the doctoral dissertations have addressed the issues in general. The remaining half is spread among R&D, media, scientific and defence libraries. Agricultural and industrial libraries are the other favoured libraries.

The objectives set for the study “To study the research areas / topics covered by researchers in western Indian universities and find the trends in LIS research” and “To find out prominent research areas and the gap in research”. The chapter highlighted the research conducted and also indicated the emerging trends in LIS research. It is observed that the research was conducted more in traditional areas and since 2005 onwards the trend of new areas is reflected in ongoing research”. This also proved positively the hypothesis stated “There is a paucity of research on the emerging issues in LIS research”. There is a need to undertake current topics for research.

### ***References:***

- Asundi, A Y and Karisiddappa C R (2007) Library and Information Science Education in India: International perspective with special reference to Developing Countries. DESIDOC Bulletin of Information Technology Vol. 27(2) March, p.5-11.
- Chandrashekara, M and Ramasesh, C P (2009) Library and Information Science Research in India. Asia Pacific Conference on LIS education and practice, p.530-537.
- Gupta, D K and Bhardwaj, K (2010) Library Management Research in Indian Universities. Annals of Library and Information Studies. Vol. 57(Dec), p.333-338.
- Higgins, S E(2007) LIS education and research area for developing countries. 5th International CALIBER. Punjab University Chandigarh. 8-10 Feb 2007
- Rath, P(2010) Information and communication technology - Application in higher education with special reference to north Eastern region. Located at [www.caluniv.ac.in/news/prabhakar.doc](http://www.caluniv.ac.in/news/prabhakar.doc) accessed on 03.09.2011.
- Wilkinson, J (1983) Ligitimization of librarianship. Libri 33(1) March, p.39.

## Chapter 6: Data Analysis and Presentation

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|      |                  |     |
|------|------------------|-----|
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|------|------------------|-----|

## **Chapter 6: Data Analysis and Presentation**



## ***6.1 Introduction:-***

This chapter elaborates different studies based on data collected from different universities under survey and the analysis of data is presented in tabular and graphical form. The data analysis highlights mainly type of documents (resources) used by the researchers while conducting the research studies (books, journals, thesis, conferences and other), topics selected for research, format of documents used (e or Print), use of web sites, chronological distribution of citations, use patterns, author patterns, subject patterns, language, geographical, and territory patterns ( country) etc.

Citation analysis as taken to mean the analysis of the citation or reference which form part of the articles in journals or any communication, it is not taken to include the study of reference appearing in secondary periodicals. Citation analysis helps to know reading habits of users in every field of knowledge. It is also helpful to librarian for studying the present position of literature and to identify the core journals. Citation analysis is an effective tool to decide the use of literature in a specific field. This is indirect method like the analysis of the library record to determine the actual use of document sources. This type of information can be utilized for setting policies for different activities in library e.g. acquisition of materials, selection of periodicals etc.

The primary purpose of citation is to enable a reader to go the referred document for information on a point of check the authenticity of a particular view finding or method. Each citation is a message from the author of a document to his readers. Citation analysis provides relevant measurement of utility and relationship of journal whose primary function is to communicate research result. This analytical method is very useful in libraries.

The data collected from the western part of Indian universities (14) and 16313 citations collected form 124 thesis for which degrees were awarded during 1980-1981 to 2010-11 in the area of LIS are analyzed , interpreted and the same is presented in this chapter.

The analysis is categorized on the basis of average citations per thesis, authorship Pattern, type of document cited, ranking of authors, geographical distribution of books, chronological distribution of total citations, chronological distribution of journal citations, chronological distribution of book citations, ranking of titles, frequency of periodicals used, co-citation pattern etc.

## ***6.2 Background of Research activity in Western Indian Universities:-.***

There are three states in this zone viz. Maharashtra, Gujrat and Goa. In all 21 non-agricultural universities are located in these states. Out of 21 universities research programs are conducted only in 14 universities. Goa University has no research programs as yet. Among 14 universities right from inception of the research programs (in every university) till 2010 in all 152 PhD degrees were awarded. The researcher visited every university in person and collected the data. Out of 152 theses only data could be collected from 124 available theses in the department of LIS. From 124 theses 16313 citations were collected and analyzed for the research purpose. Research activity initiated in western India since 1980 and the first degree awarded in 1986. Till 2001 around 37 PhD thesis were approved for PhD degree and on an average 2 thesis per year were submitted but since 2002 onwards the research growth accelerated and at the end of 2010 around 115 thesis were submitted and also awarded the degrees at the rate 12 PhD's per annum. This clearly shows about 75% rise in research. Maharashtra state awarded 136 PhD theses where as in Gujrat 16 theses have been completed. Ranking of research element indicates prominent areas related to academic libraries, information services, reference services, information seeking behaviour, use of citation analysis, bibliometrics, public libraries etc. and since 2002 onwards new research element like ICT application, library and networks, LIS education etc. were popularly discussed. The prominent research guides were Dr. PSG Kumar, Dr. Mrs. Rajyalakshmi, Dr. Mrs. N J Deshpande, Dr. Charan, Dr. S K Patil, Dr. M B Konnur etc. however new guides also reflected since 2002 onwards. Though 152 research studies completed till 2010 but onwards 136 ongoing research studies are in process. In cover of ongoing research Nagpur University has enrolled 72 research areas in short it is reflected that the progress of research in western India is progressing fast. The detailed analysis of the citations is presented in following paragraphs.

### ***6.3 Average citations per Thesis:-***

14 universities awarded 152 theses and out of these 124 theses were physically evaluated and collected the cited documents which were used by the researchers in his LIS study. The cited document collected from this research magnitude was 16313 citations. The average citation count per thesis is around 132 consisting all sorts of information resources in it.

#### **6.4 Distribution of P-Citation v/s E-Citation:-**

| Sr. No | Type        | Count | Ranking | Percentage (%) |
|--------|-------------|-------|---------|----------------|
| 1      | p-Citations | 15482 | 1       | 94.84          |
| 2      | e-Citations | 831   | 2       | 5.16           |
|        |             | 16313 |         | 100            |

*Table 6.1: P v/s. E citations*

**Observation:-** Earlier only printed information sources were used and cited but now due to use of ICT, and e- documents researchers are using and citing e-resources available in the form of e-books, e-journals and internet based information resources. The use of e-resources is increasing slowly among the research workers as availability and use is economical and fast. The trend in citing e-documents is also reflecting growth. In this study about 6% uses of e-resources is reflected. In natural sciences more use of e-resources are reflected as more data is available in e-from including databases. In social sciences now the growth of e-resources is increasing. However print resource may have dominance in its use due to comfort.

#### **6.5 Distribution of Citations According to Types of Documents:-**

| Sr. No. | Type of Document                          | Count | Percentage (%) |
|---------|---|-------|----------------|
| 1       | Journal                                   | 6874  | 42.14          |
| 2       | Books                                     | 6810  | 41.75          |
| 3       | Website                                   | 825   | 5.06           |
| 4       | Conference proceeding                     | 741   | 4.54           |
| 5       | Theses/Dissertations (MLIS, M Phil, Ph D) | 336   | 2.06           |
| 6       | Grey literature*                          | 127   | 0.78           |
| 7       | Handbook                                  | 127   | 0.78           |
| 8       | Encyclopaedia                             | 211   | 1.29           |
| 9       | Bulletin                                  | 96    | 0.59           |
| 10      | Annual report                             | 35    | 0.21           |
| 11      | Newspapers                                | 30    | 0.18           |
| 12      | Dictionaries                              | 25    | 0.15           |

|    |                          |              |               |
|----|--------------------------|--------------|---------------|
| 13 | Reviews                  | 23           | 0.14          |
| 14 | Manuals                  | 19           | 0.12          |
| 15 | Online                   | 16           | 0.10          |
| 16 | University News Bulletin | 11           | 0.07          |
| 17 | Reference book           | 7            | 0.04          |
|    |                          | <b>16313</b> | <b>100.00</b> |

Table 6.2 Distribution of Citations According to Bibliographic Format

(\*Grey Literature covers information disclosed in seminars, lectures, key note addresses, brochures, pamphlets, patrikas, diaries, leaflets, letters, profiles, manifestoes, refresher course materials, smarnika, literature distributed in training programmes etc.)

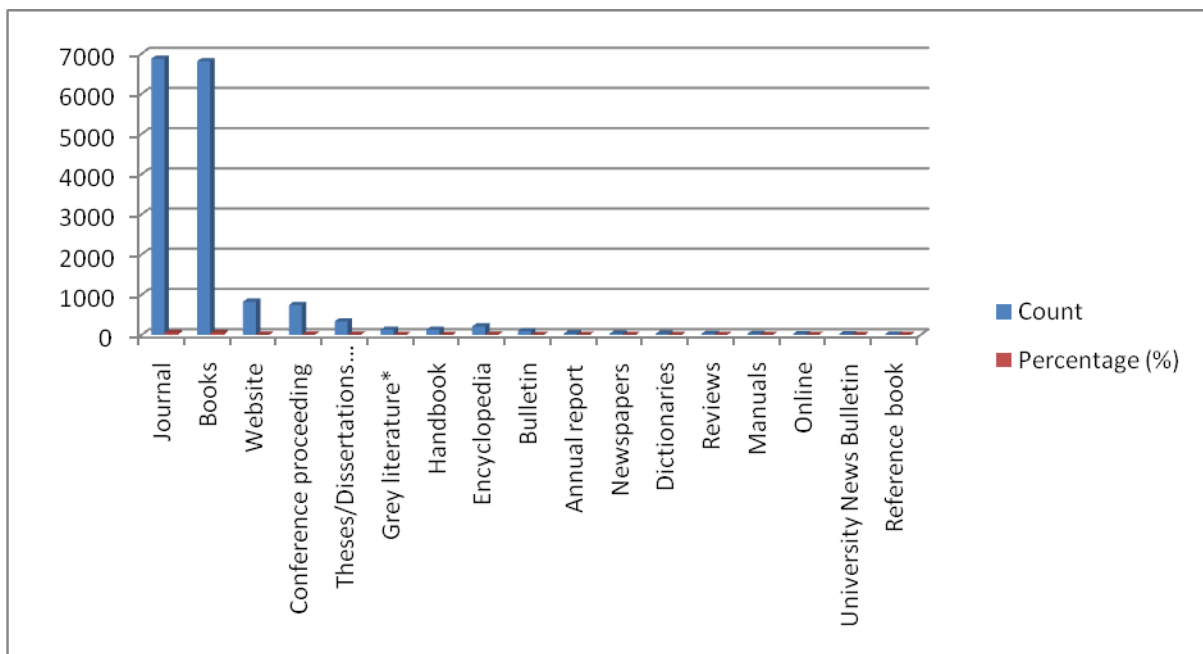


Figure 6.1 Distributions of Citations by Bibliographic Format

**Observation:** Researchers use different scholarly information resources to justify the results and hence they refer and cite the used references in their research study. The survey highlighted the use of literature in table 6.2 in which journal usage is more than other resources. This is the normal trend observed everywhere as journals are the primary source of information in which qualitative information is reported. The other prominent contribution is of books, websites, proceedings and theses. It is revealed in these study journals, books and electronics media are the most used literature in preparation of dissertations by PhD research scholars in LIS. These three formats of information resources cover almost 89% of the total citations. Nearly half of the citations are of journal articles (42.14%), followed by books

(41.75%) and electronic media (5.06%). Conferences and theses / dissertations follow closely to 6.60%. The other categories, includes grey literature covering reports, lectures seminars, brochures, annual reports patrikas etc reports, government publications, newspapers, reference sources like encyclopaedia, dictionaries, etc and counts for 4.40% of citations.

### **6.6 Use of LIS and non LIS Journals:-**

| <b>Sr. No.</b> | <b>Type of Journals</b> | <b>Citation</b> | <b>No. of Journals Titles used</b> | <b>Rank</b> | <b>Percentage (%)</b> |
|----------------|-------------------------|-----------------|------------------------------------|-------------|-----------------------|
| 1              | LIS                     | 3828            | 193                                | 1           | 55.68                 |
| 2              | Non LIS                 | 3046            | 477                                | 2           | 44.31                 |
|                |                         | <b>6874</b>     | <b>670</b>                         |             | <b>100</b>            |

*Table 6.3 Use of LIS and non LIS journals*

**Observation:** It is observed that LIS researchers are using LIS resources while conducting research study but they are also consulting to the non-LIS journal resources. It is observed that researchers while conducting studies used 193 LIS journals where as researcher have used 477 non LIS professional journals devoted to different branches of knowledge. It also reflects that in the multi-disciplinary concept, librarians and information scientists are publishing their views even in non LIS journals as articles covers specific subject areas.

### **6.7 Chronological Distribution of Total Citations:-**

| <b>Sr. No.</b> | <b>Year</b>   | <b>Citations</b> | <b>Percentage</b> | <b>Cumulative</b> |
|----------------|---------------|------------------|-------------------|-------------------|
| 1              | Prior to 1900 | 11               | 0.07              | 11                |
| 2              | 1901–1905     | 10               | 0.06              | 21                |
| 3              | 1906-1910     | 3                | 0.02              | 24                |
| 4              | 1911-1915     | 5                | 0.03              | 25                |
| 5              | 1916-1920     | 4                | 0.02              | 34                |
| 6              | 1921-1925     | 24               | 0.15              | 58                |
| 7              | 1926-1930     | 53               | 0.32              | 111               |
| 8              | 1931-1935     | 27               | 0.17              | 138               |
| 9              | 1936-1940     | 71               | 0.44              | 209               |

|    |                 |              |               |       |
|----|-----------------|--------------|---------------|-------|
| 10 | 1941-1945       | 61           | 0.37          | 270   |
| 11 | 1946-1950       | 193          | 1.18          | 463   |
| 12 | 1951-1955       | 223          | 1.37          | 686   |
| 13 | 1956-1960       | 377          | 2.31          | 1063  |
| 14 | 1961-1965       | 488          | 2.99          | 1551  |
| 15 | 1966-1970       | 990          | 6.07          | 2541  |
| 16 | 1971-1975       | 1440         | 8.83          | 3981  |
| 17 | 1976-1980       | 1712         | 10.49         | 5693  |
| 18 | 1981-1985       | 2571         | 15.76         | 8264  |
| 19 | 1986-1990       | 2204         | 13.51         | 10468 |
| 20 | 1991-1995       | 1665         | 10.21         | 12133 |
| 21 | 1996-2000       | 1606         | 9.84          | 13739 |
| 22 | 2001-2005       | 1426         | 8.74          | 15165 |
| 23 | 2006-2010       | 336          | 2.06          | 15501 |
| 24 | 2011-           | 4            | 0.02          | 15505 |
| 25 | Years not Given | 808          | 4.96          | 16313 |
|    |                 | <b>16313</b> | <b>100.00</b> |       |

*Table 6.4 Chronological distribution of total citations*

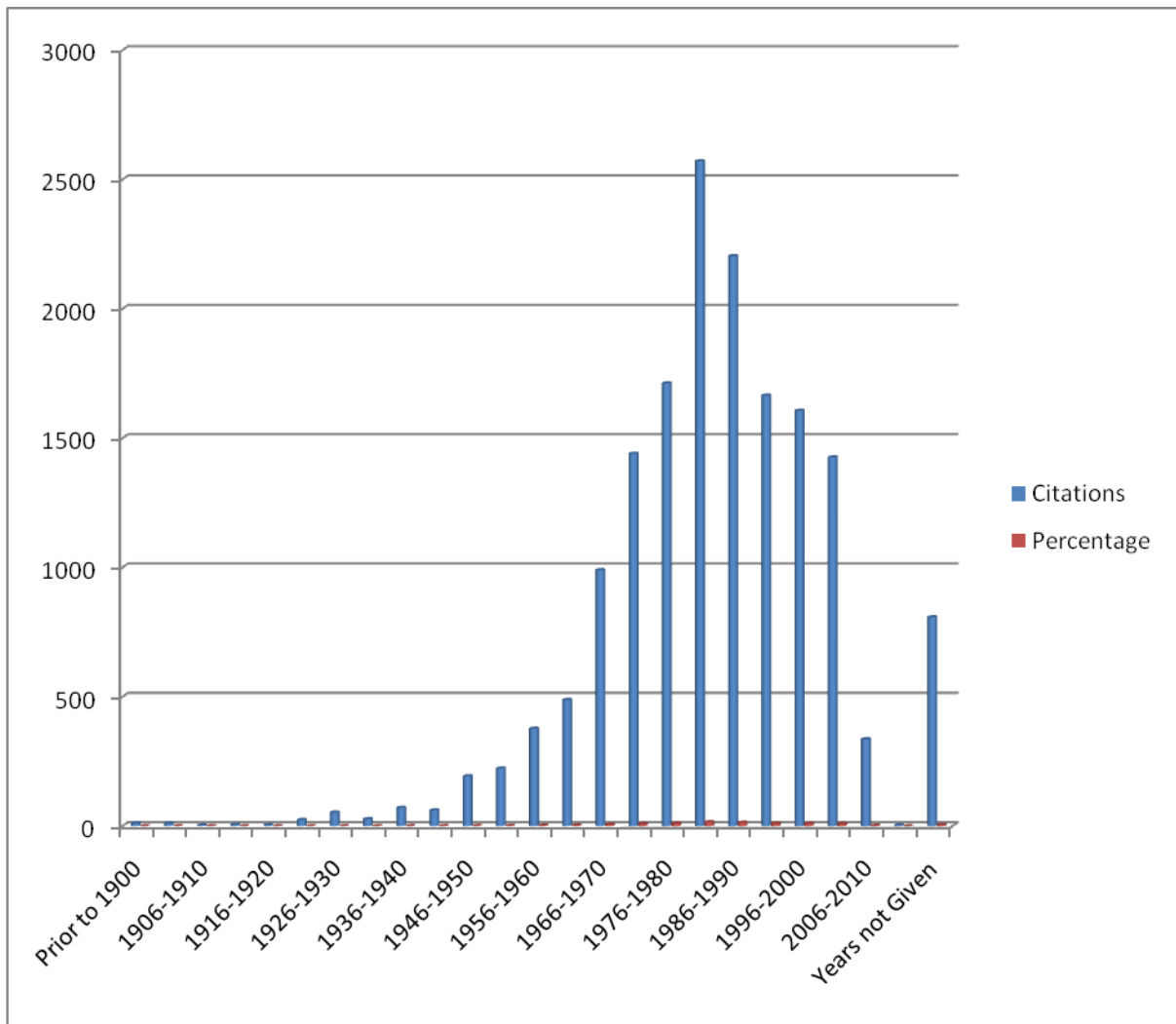


Figure 6.2 Chronological Distributions of Total Citations

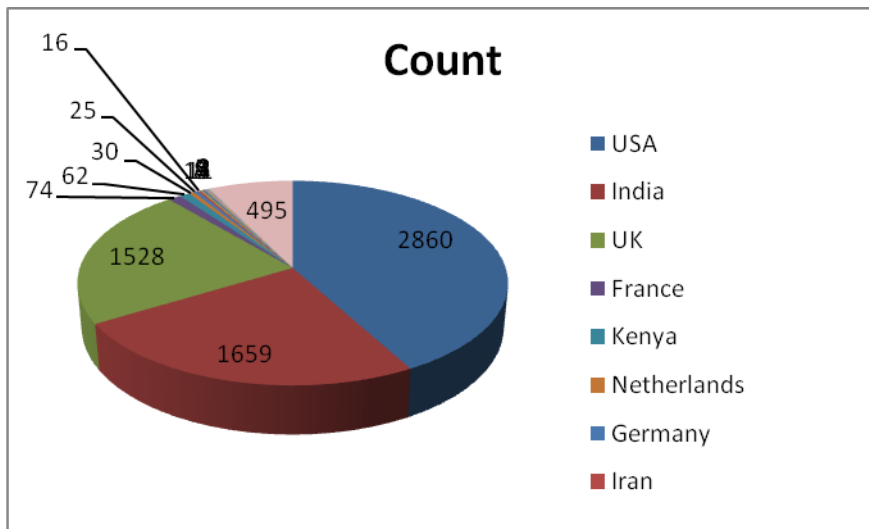
**Observation:** The analysis of chronological distribution of citation indicates the pattern of literature used in LIS research studies. The data indicates that the highest percentage of citations cited in the research study are ranging between 1981-1990 (29.27%) followed by 1991-2000 (20.05%). It is also observed that 12.74% citations are reported from the period 1966-75, whereas only 10.8% citations are reported for the current nine years 2001-2009. Trend in use of classical literature published before 1900 and 1901-1950 is 2.83%. Thus it is observed that researchers in LIS use traditional classical literature also. The maximum use of literature is 49.32% range from 1981 to 2000 (nearly 20 years). This is the golden period of citing literature in the research work. It is also observed that the current publications/ literature is cited less due to less awareness. It is observed that the half life of LIS literature is 80 years and this indicate that information growth of publishing articles in this area is normal and hence its half life is more than other discipline in social science where growth of literature is in abundance.

### 6.8 Geographical distribution of Books:-

| Sr. No | Country                | Count | Ranking | Percentage (%) |
|--------|------------------------|-------|---------|----------------|
| 1      | USA                    | 2860  | 1       | 42.00          |
| 2      | India                  | 1659  | 2       | 24.36          |
| 3      | UK                     | 1528  | 3       | 22.44          |
| 4      | France                 | 74    | 4       | 1.09           |
| 5      | Kenya                  | 62    | 5       | 0.91           |
| 6      | Netherlands            | 30    | 6       | 0.44           |
| 7      | Germany                | 25    | 7       | 0.37           |
| 8      | Iran                   | 16    | 8       | 0.23           |
| 9      | Japan                  | 13    | 9       | 0.19           |
| 10     | Sweden                 | 11    | 10      | 0.16           |
| 11     | Bangladesh             | 8     | 11      | 0.12           |
| 12     | Thailand               | 8     | 11      | 0.12           |
| 13     | Australia              | 5     | 12      | 0.07           |
| 14     | Italy                  | 4     | 13      | 0.06           |
| 15     | Europe                 | 3     | 14      | 0.04           |
| 16     | Sri Lanka              | 3     | 14      | 0.04           |
| 17     | China                  | 2     | 15      | 0.03           |
| 18     | Greek                  | 2     | 15      | 0.03           |
| 19     | Hungary                | 2     | 15      | 0.03           |
| 20     | Place / Year not Given | 495   |         | 7.27           |
|        |                        | 6810  |         | 100.00         |

*Table 6.5 Geographical distribution of Books*





*Figure 6.3 Geographical distributions of Books*

**Observation:** It is observed that researchers have consulted 41.75% book literature which is second in rank and from this it was noticed that around 89.80% book literature was used which is from three major countries USA, India and UK. Remaining 10.20 % book literature used is published from different countries of the world but counts are very less. It is also observed that few book citations are not indicating the country of publication i.e. place of publication (7.27%). The US and UK book literature is no doubt a qualitative and hence cited more in the studies by researchers, but Indian literature is also occupied prominent usage (24.36%) since the research has national base.

### ***6.9 Decade wise Chronological and Geographical Distribution of Books***

| <b>Coun<br/>try /<br/>year</b> | <b>1900</b> | <b>1901-1910</b> | <b>1911-1920</b> | <b>1921-1930</b> | <b>1931-1940</b> | <b>1941-1950</b> | <b>1951-1960</b> | <b>1961-1970</b> | <b>1971-1980</b> |     | <b>1991-2000</b> | <b>2001-2010</b> | <b>Given</b> | <b>Total</b> |
|--------------------------------|-------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----|------------------|------------------|--------------|--------------|
| <b>USA</b>                     | 0           | 3                | 4                | 44               | 25               | 144              | 227              | 481              | 931              | 677 | 216              | 62               | 46           | <b>2860</b>  |
| <b>India</b>                   | 1           | 1                | 1                | 1                | 10               | 5                | 41               | 101              | 143              | 488 | 612              | 215              | 40           | <b>1659</b>  |
| <b>UK</b>                      | 8           | 0                | 0                | 3                | 29               | 32               | 98               | 144              | 591              | 405 | 155              | 62               | 1            | <b>1520</b>  |
| <b>France</b>                  | 0           | 0                | 0                | 0                | 0                | 6                | 2                | 5                | 40               | 20  | 1                | 0                | 0            | <b>75</b>    |
| <b>Kenya</b>                   | 0           | 0                | 0                | 0                | 0                | 0                | 4                | 0                | 4                | 53  | 1                | 0                | 0            | <b>62</b>    |
| <b>Netherl<br/>ands</b>        | 0           | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 13               | 3   | 0                | 14               | 0            | <b>30</b>    |
| <b>Germany</b>                 | 0           | 0                | 0                | 6                | 0                | 0                | 0                | 9                | 0                | 7   | 2                | 0                | 0            | <b>24</b>    |
| <b>Iran</b>                    | 0           | 0                | 0                | 0                | 0                | 0                | 0                | 6                | 0                | 4   | 0                | 6                | 0            | <b>16</b>    |
| <b>Japan</b>                   | 0           | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 3                | 10  | 0                | 0                | 0            | <b>13</b>    |
| <b>Sweden</b>                  | 0           | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 9                | 0   | 0                | 0                | 2            | <b>11</b>    |
| <b>Banglade<br/>sh</b>         | 0           | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0   | 6                | 2                | 0            | <b>8</b>     |
| <b>Thailand</b>                | 0           | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 8   | 0                | 0                | 0            | <b>8</b>     |

|                  |   |   |   |   |   |   |   |   |   |   |   |   |   |              |
|------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------|
| Australia        | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6            |
| Italy            | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 3            |
| Europe           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2            |
| Sri Lanka        | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 2            |
| China            | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2            |
| Greek            | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2            |
| Hungary          | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2            |
| Places not Given |   |   |   |   |   |   |   |   |   |   |   |   |   | 505          |
|                  |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>Total</b> |
|                  |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>6810</b>  |

*Table 6.6 Chronological and Geographical Distribution of Books*

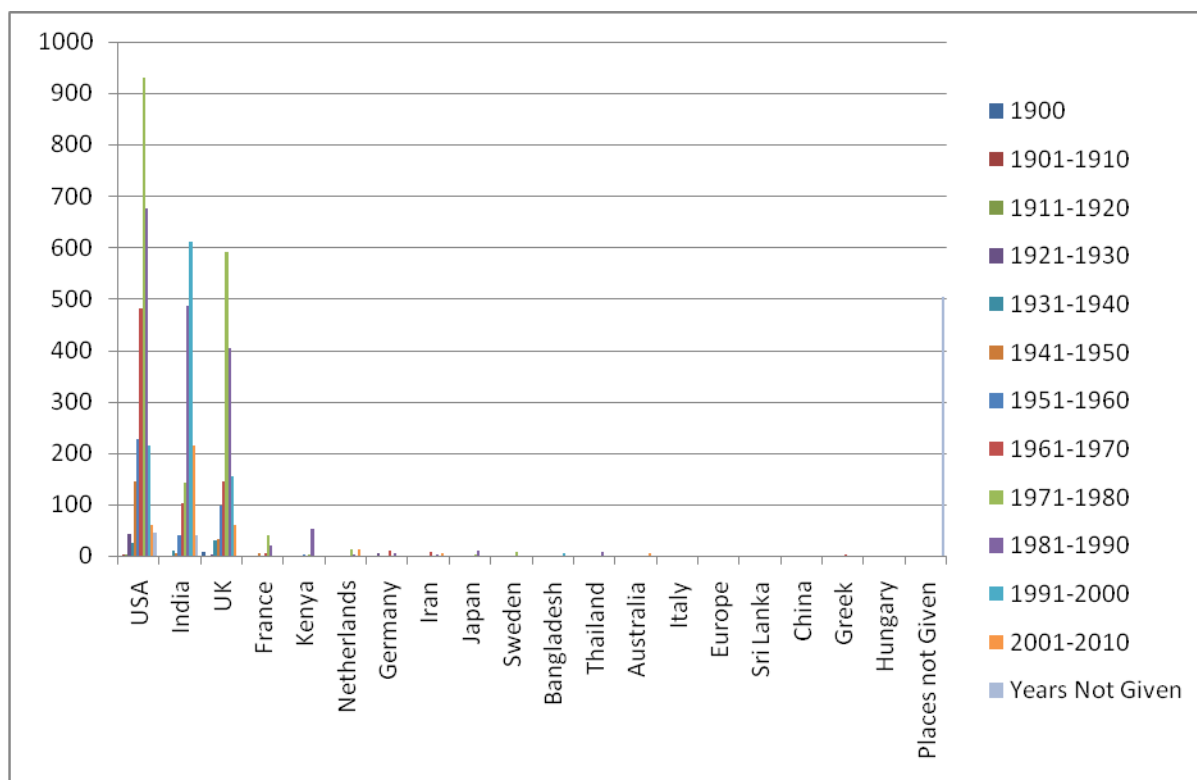


Figure 6.4 Chronological and Geographical Distributions of Books

**Observation:** Books contribute 41.75% use, three prominent countries in which more literature cited was USA, India and UK and literature cited covers the same periods in these countries i.e. 1961-2000. This period is base period for fixing policies.

### 6.10 Geographical Distribution (place) of Total Citations:-

| Sr. No. | Place            | Country    | Count | Ranking | Percentage (%) |
|---------|------------------|------------|-------|---------|----------------|
| 1       | New York         | USA        | 1343  | 1       | 17.42          |
| 2       | London           | UK         | 1181  | 2       | 15.32          |
| 3       | New Delhi        | India      | 1174  | 3       | 15.23          |
| 4       | Chicago          | USA        | 344   | 4       | 4.46           |
| 5       | Washington DC    | USA        | 252   | 5       | 3.27           |
| 6       | Cambridge (Mass) | UK         | 202   | 6       | 2.62           |
| 7       | Pune             | India      | 182   | 7       | 2.36           |
| 8       | Mumbai           | India      | 164   | 8       | 2.13           |
| 9       | Ahmadabad        | India      | 119   | 9       | 1.54           |
| 10      | Oxford           | UK         | 117   | 10      | 1.52           |
| 11      | Calcutta         | India      | 94    | 11      | 1.22           |
| 12      | West Port        | UK         | 90    | 12      | 1.17           |
| 13      | Paris            | France     | 87    | 13      | 1.13           |
| 14      | Amsterdam        | Netherland | 80    | 14      | 1.04           |
| 15      | Englewood Cliffs | USA        | 77    | 15      | 1.00           |
| 16      | Nagpur           | India      | 71    | 16      | 0.92           |

|    |           |       |    |    |      |
|----|-----------|-------|----|----|------|
| 17 | Chennai   | India | 70 | 17 | 0.91 |
| 18 | Princeton | USA   | 64 | 18 | 0.83 |
| 19 | Jaipur    | India | 63 | 19 | 0.82 |
| 20 | New Jercy | USA   | 62 | 20 | 0.80 |

*Table 6.7 Geographical Distribution of total Citations*

| Country    | Citation | Percentage (%) | Place | Ranking |
|------------|----------|----------------|-------|---------|
| USA        | 2142     | 27.78          | 6     | 1       |
| India      | 1937     | 25.13          | 8     | 2       |
| UK         | 1590     | 20.63          | 4     | 3       |
| France     | 87       | 1.13           | 1     | 4       |
| Netherland | 80       | 1.04           | 1     | 5       |
|            | 5836     | 75.71          | 20    |         |

*Table 6.8 Ranking of places based on Countries.*

**Observation:** The sources used were grouped in to places of publications and first 20 places are ranked in the table 6.7. When these 20 places are arranged according to countries it was found that the ranking also remains the same US, India and UK. But France and Netherlands are next in ranks as detailed in table 6.8.

### **6.11 Distribution of Citations by Language:-**

| Sr. No | Language  | Count | Ranking | Percentage (%) |
|--------|-----------|-------|---------|----------------|
| 1      | English   | 15781 | 1       | 96.74          |
| 2      | Gujrati   | 452   | 2       | 2.77           |
| 3      | Marathi   | 41    | 3       | 0.25           |
| 4      | Persian   | 15    | 4       | 0.09           |
| 5      | Bengali   | 7     | 5       | 0.04           |
| 6      | Russian   | 5     | 6       | 0.03           |
| 7      | Hindi     | 4     | 7       | 0.02           |
| 8      | Dutch     | 2     | 8       | 0.01           |
| 9      | German    | 2     | 8       | 0.01           |
| 10     | Hungarian | 2     | 8       | 0.01           |
| 11     | Japanese  | 2     | 8       | 0.01           |

|  |  |       |  |     |
|--|--|-------|--|-----|
|  |  | 16313 |  | 100 |
|--|--|-------|--|-----|

Table 6.9 Distribution of Total Citations by Language

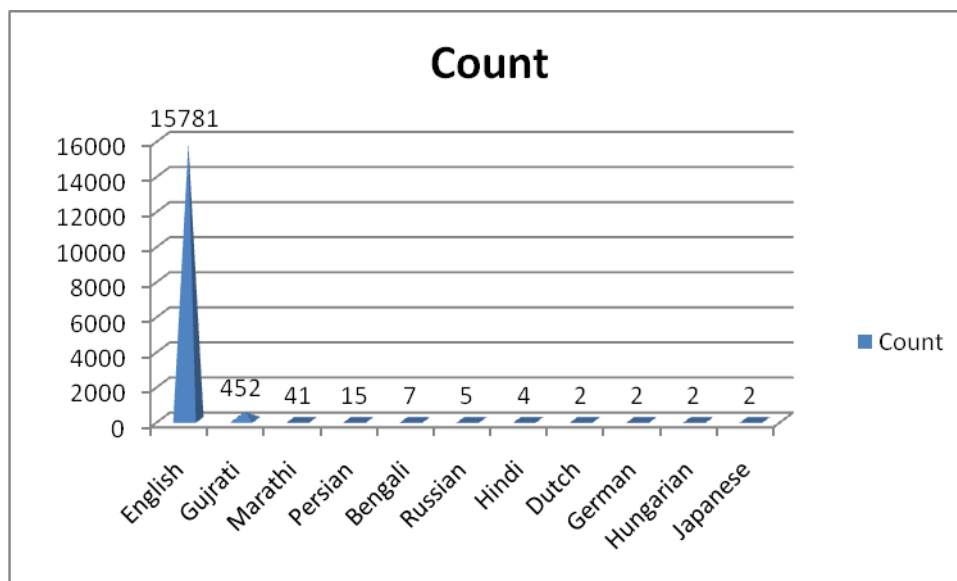


Figure 6.5 Distributions of Total Citations by Language

**Observation:-** Use of citations by the researchers in their research study using language as criterion for analysis indicated that three main languages are more popularly used i.e. English, Gujrati and Marathi, Among these three languages, an English language is document (literature) and was cited 15781 out of 16313 (96.74%), Gujrati language has 452 (2.77%) and Marathi language documents cited were 41 (0.25%). This indicates that English is the prominent language and information source used by researchers are in English mostly. The local language has less influence but some literature published in Gujrati and Marathi is also very popular at local level and being used in the study by researcher. It is also observed along with Indian languages foreign language literature is also used while conducting research (0.24%) but it is negligible. Thus the language distribution of cited document shows the preference of research students in LIS is for documents published in English followed by local languages.

## 6.12 Chronological Distribution of Citations (Journals):-

The uses of Journals citations are specifically counted to analyze the use of journal references by the scholars in LIS.

| <b>Sr. No.</b> | <b>Year</b>     | <b>Citations</b> | <b>Percentage</b> | <b>Cumulative</b> |
|----------------|-----------------|------------------|-------------------|-------------------|
| 1              | Up to 1900      | 3                | 0.04              | 3                 |
| 2              | 1901-1905       | 5                | 0.07              | 8                 |
| 3              | 1906-1910       | 1                | 0.01              | 9                 |
| 4              | 1911-1915       | 0                | 0.00              | 9                 |
| 5              | 1916-1920       | 1                | 0.01              | 10                |
| 6              | 1921-1925       | 9                | 0.13              | 19                |
| 7              | 1926-1930       | 17               | 0.25              | 36                |
| 8              | 1931-1935       | 6                | 0.09              | 42                |
| 9              | 1936-1940       | 23               | 0.33              | 65                |
| 10             | 1941-1945       | 28               | 0.41              | 93                |
| 11             | 1946-1950       | 16               | 0.23              | 109               |
| 12             | 1951-1955       | 65               | 0.95              | 174               |
| 13             | 1956-1960       | 113              | 1.64              | 287               |
| 14             | 1961-1965       | 180              | 2.62              | 467               |
| 15             | 1966-1970       | 437              | 6.36              | 904               |
| 16             | 1971-1975       | 490              | 7.13              | 1394              |
| 17             | 1976-1980       | 626              | 9.11              | 2020              |
| 18             | 1981-1985       | 1290             | 18.77             | 3310              |
| 19             | 1986-1990       | 1081             | 15.73             | 4391              |
| 20             | 1991-1995       | 891              | 12.96             | 5282              |
| 21             | 1996-2000       | 759              | 11.04             | 6041              |
| 22             | 2001-2005       | 616              | 8.96              | 6657              |
| 23             | 2006-2010       | 143              | 2.08              | 6800              |
| 24             | 2011-           | 3                | 0.04              | 6803              |
| 25             | Years not Given | 71               | 1.03              | 6874              |
|                |                 | 6874             | 100.00            |                   |

*Table 6.10 Chronological Distribution of Citations (Journals)*

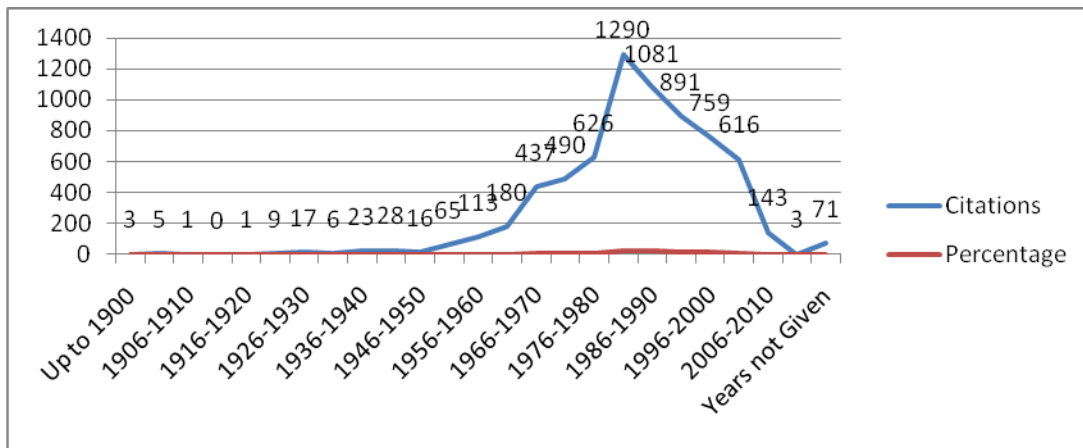


Figure 6.6 Chronological distribution of citations ( Journals)

**Observation:-** Results pointed out that the highest percentage of citations cited in the research study is ranging between 1981-1990, and 2371 cited journal articles (34.50%), followed by 1991-2000, 1650 cited Journal articles (24.00%). It is also observed that 25.22% citations (1733) are reported from the period 1961-80. Whereas only 11.08% citations (762) are reported for the current eight years 2001-2009. Trend of using classical literature published before 1900 and 1901-1960 is 2.52% (287 cited articles). Thus it is observed that researchers in LIS use traditional classical literature also. The maximum use of literature used is 59.50% ranging from 1981 to 2000 (nearly 20 years). This is the golden period of citing literature in the research work. It is also observed that the current publications are cited less due to less awareness of publications.

### 6.13 Frequency of Journals Citations:-

| Frequency | Journals Used | Percentage (%) |
|-----------|---------------|----------------|
| 1         | 226           | 3.35           |
| 2-5       | 244           | 3.62           |
| 6-10      | 95            | 1.41           |
| 11-15     | 25            | 0.37           |
| 16-20     | 19            | 0.28           |
| 21-25     | 8             | 0.12           |
| 26-30     | 6             | 0.09           |
| 31-35     | 4             | 0.06           |
| 36-40     | 6             | 0.09           |
| 41-45     | 3             | 0.04           |



|         |   |      |
|---------|---|------|
| 46-50   | 3 | 0.04 |
| 51-55   | 1 | 0.01 |
| 56-60   | 3 | 0.04 |
| 61-65   | 4 | 0.06 |
| 66-70   | 1 | 0.01 |
| 71-75   | 4 | 0.06 |
| 76-80   | 1 | 0.01 |
| 81-85   | 0 | 0.00 |
| 86-90   | 0 | 0.00 |
| 91-95   | 2 | 0.03 |
| 96-100  | 0 | 0.00 |
| 101-105 | 0 | 0.00 |
| 106-110 | 1 | 0.01 |
| 111-115 | 0 | 0.00 |
| 116-120 | 2 | 0.03 |
| 121-125 | 2 | 0.03 |
| 126-130 | 0 | 0.00 |
| 131-135 | 1 | 0.01 |
| 136-140 | 0 | 0.00 |
| 141-145 | 1 | 0.01 |
| 146-150 | 0 | 0.00 |
| 151-155 | 0 | 0.00 |
| 156-160 | 0 | 0.00 |
| 161-165 | 0 | 0.00 |
| 166-170 | 2 | 0.03 |
| 171-175 | 1 | 0.01 |
| 176-180 | 0 | 0.00 |
| 181-185 | 0 | 0.00 |
| 186-190 | 0 | 0.00 |
| 191-195 | 0 | 0.00 |
| 196-200 | 0 | 0.00 |
| 201-205 | 0 | 0.00 |

|         |             |             |
|---------|-------------|-------------|
| 206-210 | 1           | 0.01        |
| 211-215 | 0           | 0.00        |
| 216-220 | 0           | 0.00        |
| 221-225 | 0           | 0.00        |
| 226-230 | 0           | 0.00        |
| 231-235 | 0           | 0.00        |
| 236-240 | 0           | 0.00        |
| 241-245 | 0           | 0.00        |
| 246-250 | 0           | 0.00        |
| 251-255 | 1           | 0.01        |
| 256-260 | 0           | 0.00        |
| 261-265 | 0           | 0.00        |
| 266-170 | 1           | 0.01        |
|         | <b>6744</b> | <b>100%</b> |

Table 6.11 Frequency of Journals Citations

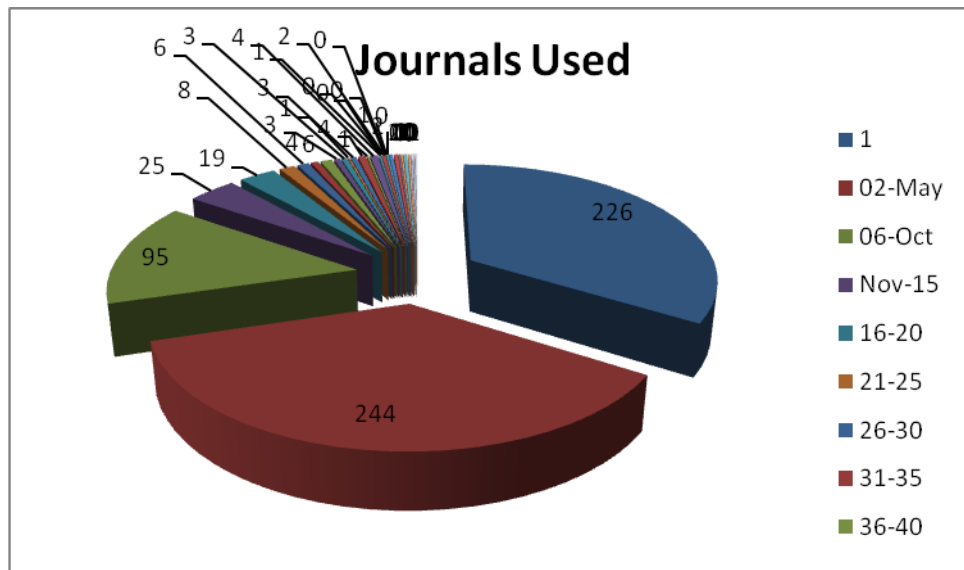


Figure 6.7 Frequency of Journals citations

**Observation:-** Based on the cited data collected from the thesis, frequency of journals used by the researcher was ranked and reported in the table 6.11 and table 6.12. The first 14 ranked journals cited more frequently are listed in table 6.12. ASLIB Proceedings stands first and in this list Indian journals IASLIC Bulletin, Annals of Library Science and Documentations are covered among these 14 ranked journals.

| Sr. No. | Journal name   | Count | Ranking | Percentage (%) |
|---------|--|-------|---------|----------------|
| 1       | Aslib Proceedings  | 321   | 1       | 4.67           |
| 2       | Library Trends   | 285   | 2       | 4.15           |
| 3       | Library Quarterly  | 226   | 3       | 3.29           |
| 4       | Journal of Education for Library and Information Science           | 190   | 4       | 2.76           |
| 5       | Journal of American Society for Information Science and Technology | 178   | 5       | 2.59           |
| 6       | Library and Information Science Abstracts                          | 166   | 6       | 2.41           |
| 7       | IASLIC Bulletin  | 142   | 7       | 2.07           |
| 8       | Herald of Library Science  | 131   | 8       | 1.91           |
| 9       | Libri  | 122   | 9       | 1.77           |
| 10      | Library Science With a slant to Documentation                      | 121   | 10      | 1.76           |
| 11      | Journal of Academic Librarianship                                  | 120   | 11      | 1.75           |
| 12      | Annals of Library Science and Documentation                        | 117   | 12      | 1.70           |
| 13      | American Economic Review   | 112   | 13      | 1.63           |
| 14      | International Library Review                                       | 107   | 14      | 1.56           |

Table 6.12 Top 14 ranked journals as per frequency of use

#### 6.14 Half Life of Total citations:-

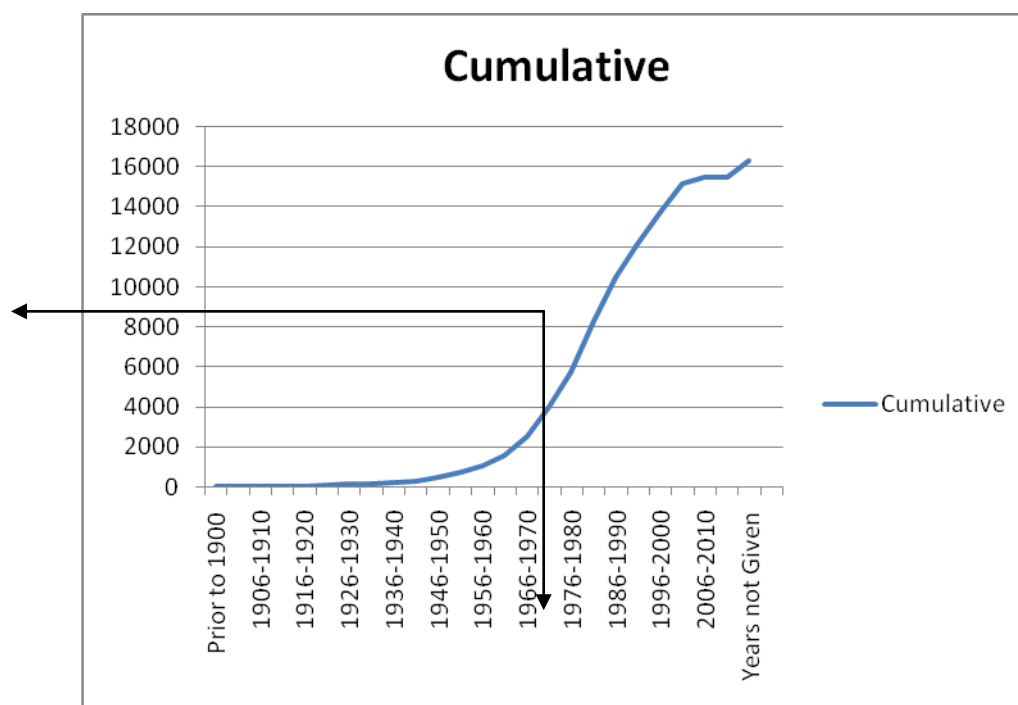


Figure 6.8 Half Life of Total Citations

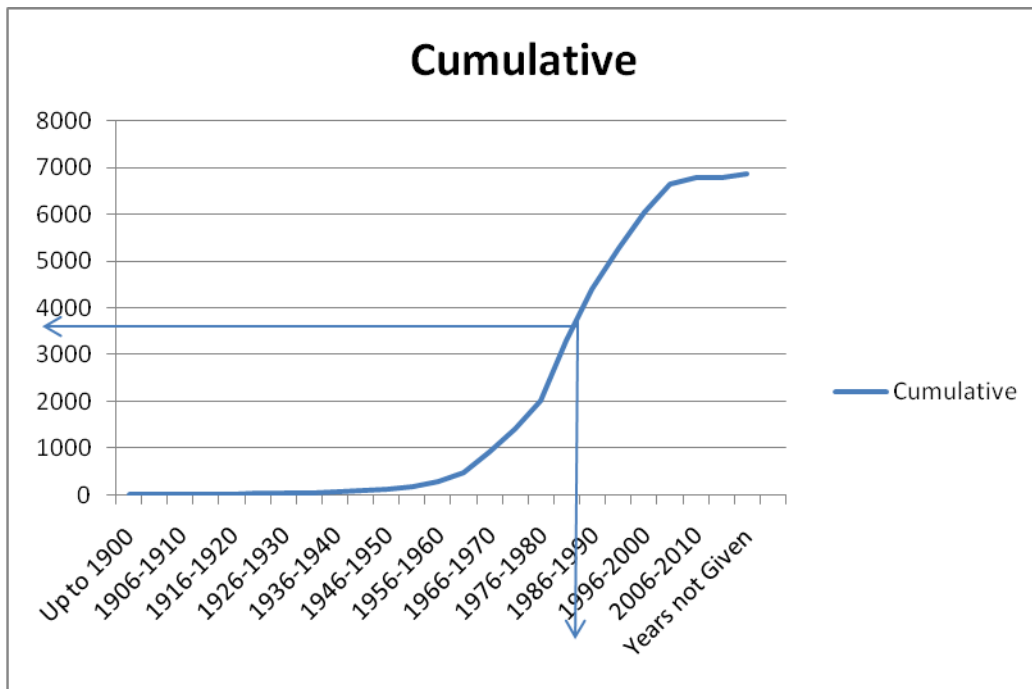


Figure 6.9 Half life of Journals Citations

**Observation:-** ‘Obsolescence’ is a term that frequently occurs in the literature of bibliometrics and citation analysis studies. Analysis of citations by age of the cited documents can indicate the ‘useful life’ or the ‘Half life’ or the ‘Obsolescence rate’ of the documents. The half life of literature used for any study in a particular discipline depends on the number of years respectively needed to satisfy one half of all the literature cited on the subject or one half of the citations made to the literature in the current year. (Hadagali et. al , 2009)

To calculate the half life of journal citations in the present study, a graph was plotted using the data presented in Table No. 1.5.1 Chronological Distribution of Citations (Journals). Mapping the period of years at the interval of 5 years on x-axis and cumulative no of citations on y-axis. The lines drawn in the graph indicate half of the total citations (6874) that is 3437. And the lines represent half life period for journals citations in LIS which falls on an average 88 years. Thus half life period of the journal citation for the present analysis is taken as 88 years.

### 6.15 Authorship Pattern:-

Authors write articles individually or with joint, authorship or article in collaboration with more authors as given in the following table.

| Sr. No. | Author                  | No. of Citation | Percentage (%) |
|---------|-------------------------|-----------------|----------------|
| 1       | Single author           | 11583           | 71.00          |
| 2       | Two authors             | 2428            | 14.88          |
| 3       | Three authors           | 264             | 1.62           |
| 4       | More than three authors | 62              | 0.38           |
| 5       | Editors                 | 1034            | 6.34           |
| 6       | Corporate bodies        | 117             | 0.72           |
| 7       | URL (Websites)          | 825             | 5.06           |
|         |                         | <b>16313</b>    | <b>100.00</b>  |

Table 6.13 Authorship Pattern

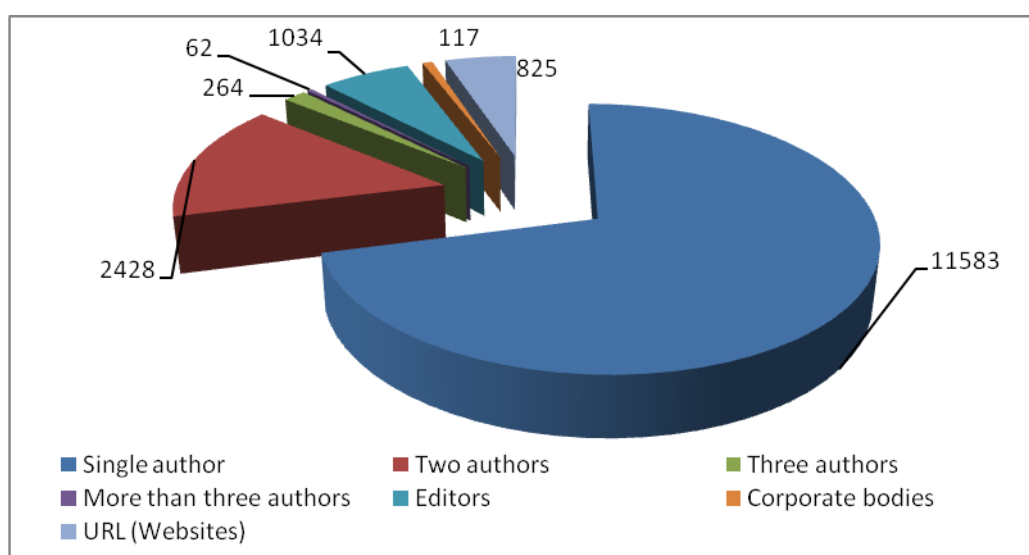


Figure 6.10 Authorship Pattern

**Observation:-** A total number of 16313 citations were analyzed to ascertain the authorship pattern of cited documents by LIS researchers. Some of the cited documents such as reports, government publications and dictionaries and encyclopedias do not have personal authors but have editors, compilers, associations etc. Therefore these documents are included under the heads editor and corporate body in the analysis. The authorship pattern was categorized into 7 groups: single author, two authors, three authors, more than three authors, editors, corporate bodies, internet resources at URL.

Table 6.12 reveals that majority (11583), (71.00%) of citations in thesis are having single-author work. This is followed by 2428 (14.88%) work authored by two authors, 264 (1.62%) by three authors, and 62 (0.38%) are by more than three authors. The editors comprises 1034 (6.34%), corporate authors or bodies have 117 citations (0.72). The use of internet resources is increasing and in the study 825 (5.06%) information resources the net is being used by researchers. The authorship pattern in this study indicates that LIS dissertations favoured single authors work

### **6.18 Co-Authorship Pattern:-**

| Sr. No. | Author2           | Author1            | Count | Rank | Percentage (%) |
|---------|-------------------|--------------------|-------|------|----------------|
| 1       | Harter S P        | Bush C H           | 21    | 1    | 0.86           |
| 2       | Carolyn D         | Abbott Iaa T       | 16    | 2    | 0.66           |
| 3       | Hickson D J       | Pugh D S           | 16    | 2    | 0.66           |
| 4       | Kannappanavar B U | Ijari S R          | 15    | 3    | 0.62           |
| 5       | King D W          | Griffiths J M      | 15    | 3    | 0.62           |
| 6       | Stiglitz J E      | Sappington D E M   | 13    | 4    | 0.54           |
| 7       | Fenichel Carol H  | Harter Stephen P   | 12    | 5    | 0.49           |
| 8       | Linkins Germaine  | Hanson Elizabeth   | 12    | 5    | 0.49           |
| 9       | Schrader Alvin M  | Houser L           | 12    | 5    | 0.49           |
| 10      | Butchart Ina      | Fothergill Richard | 11    | 6    | 0.45           |
| 11      | Ihdanova T A      | Klepov B S         | 11    | 6    | 0.45           |
| 12      | Luccock Graham    | Ford Nick          | 11    | 6    | 0.45           |
| 13      | Robertason S K    | Belkin N J         | 11    | 6    | 0.45           |
| 14      | Briggs E          | Johnson C          | 10    | 7    | 0.41           |
| 15      | German Wiliam     | Adler M J          | 10    | 7    | 0.41           |
| 16      | Gerstberger P G   | Allen T J          | 10    | 7    | 0.41           |
| 17      | Mansfield Una     | Machlup Fritz      | 10    | 7    | 0.41           |
| 18      | Nilan Michael     | Dervin Brenda      | 10    | 7    | 0.41           |
| 19      | Roberts Norman    | Davinson Donald    | 10    | 7    | 0.41           |
| 20      | Robins Kelvin     | Webster Frank      | 10    | 7    | 0.41           |
| 21      | Rousseau R        | Egghe I            | 10    | 7    | 0.41           |
| 22      | Sadison A         | Line M B           | 10    | 7    | 0.41           |
| 23      | Santman A         | Garden Michael D   | 10    | 7    | 0.41           |
| 24      | Debons A          | Nasri William Z    | 9     | 8    | 0.37           |
| 25      | Etzionl E         | Etzion A           | 9     | 8    | 0.37           |
| 26      | Nicholls S Howard | Nicholls Audrey    | 9     | 8    | 0.37           |
| 27      | Ramaiah L S       | Pathak Vijay       | 9     | 8    | 0.37           |
| 28      | Smith Linda C     | Lancaster F W      | 9     | 8    | 0.37           |
| 29      | Spence J T        | Spence K W         | 9     | 8    | 0.37           |
| 30      | Tauber M F        | Wilson L R         | 9     | 8    | 0.37           |
| 31      | Alexander A       | Newhouse P         | 8     | 8    | 0.33           |

|    |                       |                    |   |    |      |
|----|-----------------------|--------------------|---|----|------|
| 32 | Bausor Randall        | Brown-collier Elba | 8 | 8  | 0.33 |
| 33 | Beheshti J            | Anctil E           | 8 | 8  | 0.33 |
| 34 | Bower G H             | Hilgard E R        | 8 | 8  | 0.33 |
| 35 | Cecchetti S G         | Ball Laurence      | 8 | 8  | 0.33 |
| 36 | Charles F Allies      | Lai Pouching       | 8 | 8  | 0.33 |
| 37 | Colony R E            | Nalimov V V        | 8 | 8  | 0.33 |
| 38 | Creeps J E            | Mason R M          | 8 | 8  | 0.33 |
| 39 | Dalbello M            | Saracevie T        | 8 | 8  | 0.33 |
| 40 | David J               | Grimha W           | 8 | 8  | 0.33 |
| 41 | David Mender          | Laing ken          | 8 | 8  | 0.33 |
| 42 | Demsetz Harold        | Alchian Arman      | 8 | 8  | 0.33 |
| 43 | Dijksterhuis E J      | Forbes R J         | 8 | 8  | 0.33 |
| 44 | Flowerdew A D J       | Martyn John        | 8 | 8  | 0.33 |
| 45 | Gallagher M E         | McCray A T         | 8 | 8  | 0.33 |
| 46 | Gotlieb C C           | Weisstub D N       | 8 | 8  | 0.33 |
| 47 | Griffith B C          | Garvey W D         | 8 | 8  | 0.33 |
| 48 | Gupta Urmil           | Maihan Inder Bir   | 8 | 8  | 0.33 |
| 49 | Havard-Williams Peter | Nzotta Briggs C    | 8 | 8  | 0.33 |
| 50 | Huhtanen Annl         | Koskiala Sinnikka  | 8 | 8  | 0.33 |
| 51 | Kingslay H L          | Garry Ralph        | 8 | 8  | 0.33 |
| 52 | Koch Chirstof         | Poggio Tomaso      | 8 | 8  | 0.33 |
| 53 | Krishan Kumar         | Girija Kumar       | 8 | 8  | 0.33 |
| 54 | Lotka Alfred          | Dublin Louisl      | 8 | 8  | 0.33 |
| 55 | Magat W A             | Viscusi W K        | 8 | 8  | 0.33 |
| 56 | Marc Jocelyn          | Hunt Li            | 8 | 8  | 0.33 |
| 57 | Marshal C C           | Levy D M           | 8 | 8  | 0.33 |
| 58 | Norman D A            | Lindsay P H        | 8 | 8  | 0.33 |
| 59 | Norton Will Jr        | Norton S W         | 8 | 8  | 0.33 |
| 60 | Pfaff Anita           | Fiaff Martin       | 8 | 8  | 0.33 |
| 61 | Reed J F              | Smith V K          | 8 | 8  | 0.33 |
| 62 | Rhonde J E            | Lawler E E         | 8 | 8  | 0.33 |
| 63 | Riely John G          | Hirschleifer Jack  | 8 | 8  | 0.33 |
| 64 | Satyanarayana R       | Rajan T N          | 8 | 8  | 0.33 |
| 65 | Saurman D S           | Ekelund R B Jr     | 8 | 8  | 0.33 |
| 66 | Schwartz J H          | Kendel E           | 8 | 8  | 0.33 |
| 67 | Sejnowski T J         | Churchland P S     | 8 | 8  | 0.33 |
| 68 | Sesnowitz Michael     | Raymond Richard    | 8 | 8  | 0.33 |
| 69 | Shoup Carl S          | Head John G        | 8 | 8  | 0.33 |
| 70 | Sunder Shyam          | Plott C R          | 8 | 8  | 0.33 |
| 71 | Weisbrod B A          | Hansen W Lee       | 8 | 8  | 0.33 |
| 72 | whitehead C M E       | Flowerdew A D J    | 8 | 8  | 0.33 |
| 73 | Kahn Robert L         | Katz Daniel        | 7 | 9  | 0.29 |
| 74 | Vann                  | Deusen Niel C      | 7 | 9  | 0.29 |
| 75 | Al-Jasem A            | Anwar M A          | 6 | 10 | 0.25 |

|    |                  |                 |   |    |      |
|----|------------------|-----------------|---|----|------|
| 76 | Flagg P W        | Reynolds A B    | 6 | 10 | 0.25 |
| 77 | GreenN P A       | Rapper J F      | 6 | 10 | 0.25 |
| 78 | Kaur Amritpal    | Kumar Rajeev    | 6 | 10 | 0.25 |
| 79 | Kaur S           | Arora J         | 6 | 10 | 0.25 |
| 80 | Keenan Stelle    | Armatrong Chris | 6 | 10 | 0.25 |
| 81 | Leggate P        | Brember V L     | 6 | 10 | 0.25 |
| 82 | Lipkin Efrem     | Colstad Ken     | 6 | 10 | 0.25 |
| 83 | Luckmann Thomas  | Berger P L      | 6 | 10 | 0.25 |
| 84 | Manoharlal       | Agrawal S P     | 6 | 10 | 0.25 |
| 85 | Paris Marion     | White Herbert S | 6 | 10 | 0.25 |
| 86 | Pawar Usha       | Gupta P K       | 6 | 10 | 0.25 |
| 87 | Ramachandran R   | Kumar P S G     | 6 | 10 | 0.25 |
| 88 | Savanur Kiran P  | Patil Y M       | 6 | 10 | 0.25 |
| 89 | Schvaneveldt R W | Meyer D E       | 6 | 10 | 0.25 |
| 90 | Struges Paul     | Feather John    | 6 | 10 | 0.25 |
| 91 | Tanner Laurel N  | Tanner Daniel   | 6 | 10 | 0.25 |
| 92 | Vashishth C P    | Riahinia N      | 6 | 10 | 0.25 |
| 93 | Verdin J A       | Lynch B P       | 6 | 10 | 0.25 |
| 94 | Wilkinson W D    | Sass Margo A    | 6 | 10 | 0.25 |

*Table 6.14 Co-Authorship Pattern*

**Observation:-** Among the 2428 cited documents 973 are represented by joint authors (Co-Authors). In the ranking of first five Busha and Harter represent first rank with 21 citations. The details are listed in Table 6.13. In single authorship contribution were pointed author was Dr. S R Ranganathan.

### **6.17 Ranking of Authors:-**

| Sr. No. | Author1          | Count | Rank | Percentage (%) |
|---------|------------------|-------|------|----------------|
| 1       | Ranganathan S R  | 84    | 1    | 0.72           |
| 2       | Lancaster F W    | 69    | 2    | 0.59           |
| 3       | Neelameghan A    | 65    | 3    | 0.55           |
| 4       | Kumar P S G      | 63    | 4    | 0.54           |
| 5       | Mangla P B       | 62    | 5    | 0.53           |
| 6       | Gopinath M A     | 60    | 6    | 0.51           |
| 7       | Arrow Kenneth J  | 56    | 7    | 0.48           |
| 8       | Machlu Fritz     | 54    | 8    | 0.46           |
| 9       | White Herbert S  | 49    | 9    | 0.42           |
| 10      | Kaula P N        | 47    | 10   | 0.40           |
| 11      | Shera J H        | 40    | 11   | 0.34           |
| 12      | Smith A          | 36    | 12   | 0.31           |
| 13      | Kakodkar Archana | 35    | 13   | 0.30           |
| 14      | Swanson D R      | 35    | 13   | 0.30           |
| 15      | Danton J Periam  | 33    | 14   | 0.28           |



|    |                              |    |    |      |
|----|------------------------------|----|----|------|
| 16 | Kent A                       | 33 | 14 | 0.28 |
| 17 | Davinson Donald              | 32 | 15 | 0.27 |
| 18 | Khurshid Anis                | 31 | 16 | 0.26 |
| 19 | Line Maurice B               | 31 | 16 | 0.26 |
| 20 | Kumar Krishan                | 30 | 17 | 0.26 |
| 21 | Wilson P G                   | 30 | 17 | 0.26 |
| 22 | Brookes B C                  | 28 | 18 | 0.24 |
| 23 | Belkin N J                   | 26 | 19 | 0.22 |
| 24 | Havard - Williame P          | 26 | 19 | 0.22 |
| 25 | Boulding Kenneth K           | 25 | 20 | 0.21 |
| 26 | Cronin Blaise                | 25 | 20 | 0.21 |
| 27 | University Grants Commission | 25 | 20 | 0.21 |
| 28 | Marschak Jacob               | 24 | 21 | 0.20 |
| 29 | Melodgy William H            | 24 | 21 | 0.20 |
| 30 | Jones Derek                  | 23 | 22 | 0.20 |
| 31 | Conant Ralph W               | 22 | 23 | 0.19 |
| 32 | Debons Anthony               | 22 | 23 | 0.19 |
| 33 | Kamat V A                    | 22 | 23 | 0.19 |
| 34 | McGarry K J                  | 22 | 23 | 0.19 |
| 35 | Agrawal S P                  | 21 | 24 | 0.18 |
| 36 | Bhattacharya G               | 21 | 24 | 0.18 |
| 37 | Simon H A                    | 21 | 24 | 0.18 |
| 38 | Bliss H E                    | 20 | 25 | 0.17 |
| 39 | Busha Charles H              | 20 | 25 | 0.17 |
| 40 | Girija Kumar                 | 20 | 25 | 0.17 |

*Table 6.15 Ranking of Authors*

**Observation:-** Authors from the 3548 cited documents were identified and sorted to calculate frequency count. These are only personal authors, excluding two and more than two authors, editors and corporate authors etc. Joint authors are treated separately. A total of 3548 authors were identified with 11712 citations based on cumulative counts of author names. The most cited authors are listed in Table 6.14 . The ranking of authors as per citation count is calculated and authors cited minimum 20 times is considered for ranking purpose. The list includes prominent personalities in the field. Dr S R Ranganathan is most cited author (84 times).In the first ten ranks Indian authors are more prominent.

### **6.18 Ranking of Publishers:-**

| Sr. No | Publisher                       | Count | Ranking | Percentage (%) |
|--------|---------------------------------|-------|---------|----------------|
| 1      | Acamdemic Press                 | 214   | 1       | 2.89           |
| 2      | Bingley                         | 213   | 2       | 2.88           |
| 3      | Marcel Dekkar Inc               | 198   | 3       | 2.67           |
| 4      | America Library Association     | 152   | 4       | 2.05           |
| 5      | Prentice Hall Inc               | 145   | 5       | 1.96           |
| 6      | Mc Graw Hill book co            | 121   | 6       | 1.63           |
| 7      | Oxford Publishing House         | 115   | 7       | 1.55           |
| 8      | Ess Ess Publications            | 106   | 8       | 1.43           |
| 9      | Uneversity of Pune              | 104   | 9       | 1.40           |
| 10     | Macmillan Publishing Company    | 99    | 10      | 1.34           |
| 11     | Wiley Eastern Private ltd       | 99    | 10      | 1.34           |
| 12     | Library Assocation publishing   | 91    | 11      | 1.23           |
| 13     | Aslib                           | 88    | 13      | 1.19           |
| 14     | Knowledge Industry Publications | 86    | 14      | 1.16           |
| 15     | MIT press                       | 82    | 15      | 1.11           |
| 16     | Green wood Press                | 80    | 16      | 1.08           |
| 17     | Elsevier Science Publisher      | 70    | 17      | 0.95           |
| 18     | UNESCO                          | 70    | 17      | 0.95           |
| 19     | Vikas Publishing House          | 68    | 18      | 0.92           |
| 20     | Harvad University Press         | 63    | 19      | 0.85           |
| 21     | Indian Library Association      | 60    | 20      | 0.81           |
| 22     | Penguin Books                   | 60    | 20      | 0.81           |
| 23     | Princeton University press      | 59    | 21      | 0.80           |
| 24     | Asia Publishing House           | 56    | 22      | 0.76           |
| 25     | University Press                | 54    | 23      | 0.73           |
| 26     | Concept Publishing Company      | 49    | 24      | 0.66           |
| 27     | Columbia University Press       | 48    | 25      | 0.65           |
| 28     | Cambridge University Press      | 47    | 26      | 0.63           |
| 29     | pergaman press                  | 46    | 27      | 0.62           |
| 30     | John Wiley and Sons pub         | 44    | 28      | 0.59           |
| 31     | university of chicago press     | 42    | 29      | 0.57           |
| 32     | Sage Publication                | 41    | 30      | 0.55           |
| 33     | University Grants Commission    | 40    | 31      | 0.54           |
| 34     | Anmol publication               | 39    | 32      | 0.53           |
| 35     | Routledge & Kengan Paul         | 39    | 32      | 0.53           |
| 36     | Scarecrow press                 | 37    | 33      | 0.50           |
| 37     | Encyclopeaedia Britannica       | 36    | 34      | 0.49           |
| 38     | Ablex Publishing                | 35    | 35      | 0.47           |
| 39     | Basil Blackwell                 | 34    | 36      | 0.46           |
| 40     | Gower publishing Co Ltd         | 34    | 36      | 0.46           |
| 41     | Harper and Row                  | 34    | 36      | 0.46           |
| 42     | INSDOC                          | 34    | 36      | 0.46           |
| 43     | Nagpur University               | 34    | 36      | 0.46           |

|    |  |    |    |      |
|----|--|----|----|------|
| 44 | University of Illinois press             | 34 | 36 | 0.46 |
| 45 | Reinhold Publishing                      | 33 | 37 | 0.45 |
| 46 | American Library association             | 32 | 38 | 0.43 |
| 47 | B R Publication                          | 32 | 38 | 0.43 |
| 48 | World Publishing                         | 32 | 38 | 0.43 |
| 49 | DRTC                                     | 30 | 39 | 0.41 |
| 50 | Bowker Saur                              | 29 | 40 | 0.39 |
| 51 | RBSA Publication                         | 29 | 40 | 0.39 |
| 52 | Sterling Publication                     | 29 | 40 | 0.39 |
| 53 | Carnegie Corporation                     | 28 | 41 | 0.38 |
| 54 | Facet Publication                        | 28 | 41 | 0.38 |
| 55 | Johns Hopkins University press           | 28 | 41 | 0.38 |
| 56 | Scaancrow Press Inc                      | 27 | 42 | 0.36 |
| 57 | Libraries unlimited                      | 27 | 42 | 0.36 |
| 58 | Springer-Verlag                          | 27 | 42 | 0.36 |
| 59 | University of Michigan press             | 27 | 42 | 0.36 |
| 60 | Chapman & Hall                           | 26 | 43 | 0.35 |
| 61 | Information Resources press              | 26 | 43 | 0.35 |
| 62 | Tata McGraw-Hill Publishing              | 26 | 43 | 0.35 |
| 63 | IASLIC                                   | 25 | 44 | 0.34 |
| 64 | British Library Research and Development | 24 | 45 | 0.32 |
| 65 | Oryx Press                               | 24 | 45 | 0.32 |
| 66 | S Chand and Com                          | 24 | 45 | 0.32 |
| 67 | Andra Deutsch                            | 23 | 46 | 0.31 |
| 68 | Chicago University Press                 | 23 | 46 | 0.31 |
| 69 | Kogan Page                               | 23 | 46 | 0.31 |
| 70 | Freeman                                  | 22 | 47 | 0.30 |
| 71 | Himalaya Publishing House                | 22 | 47 | 0.30 |
| 72 | HW Wilson                                | 22 | 47 | 0.30 |
| 73 | Information Industry Publication         | 22 | 47 | 0.30 |
| 74 | Melville Publication Company             | 22 | 47 | 0.30 |
| 75 | University of Bombay                     | 22 | 47 | 0.30 |
| 76 | Wesley                                   | 22 | 47 | 0.30 |
| 77 | American Society for Information Science | 20 | 48 | 0.27 |
| 78 | Print House                              | 20 | 48 | 0.27 |
| 79 | Syracuse University Press                | 20 | 48 | 0.27 |
| 80 | T R Publications                         | 20 | 48 | 0.27 |
| 81 | Westrien Press                           | 20 | 48 | 0.27 |
| 82 | Free press                               | 19 | 49 | 0.26 |
| 83 | North Holland Publishing Company         | 19 | 49 | 0.26 |
| 84 | Gujrat Pustakalaya Mandal                | 19 | 49 | 0.26 |
| 85 | Pitman Publishing                        | 19 | 49 | 0.26 |
| 86 | University Publication Board             | 19 | 49 | 0.26 |
| 87 | Allied Published PvtLtd                  | 18 | 50 | 0.24 |

|    |                   |    |    |      |
|----|-------------------|----|----|------|
| 88 | ISI Press         | 18 | 50 | 0.24 |
| 89 | RR Bowker Company | 18 | 50 | 0.24 |

*Table 6.16 Ranking of Publishers*

**Observation:-** The cited references were analyzed as per the publishers to find ranking of the publisher and most prominent publishers in the field of LIS. The ranking is presented in the following table. It is observed that from 7406 cited books divided in to 904 publishers. Out of these first 10 prominent publishers are listed below in which Academic Press, Marcell Dekker, ALA, Prentice hall, Clive Bingley, Mc-Graw Hill, Oxford, Ess Ess Delhi, Macmillan and Wiley are at the leading position having 1472 citations(19.92%)

### **6.19 Ranking of Journals in LIS:-**

| <b>Sr. No.</b> | <b>Journal name</b>  | <b>Count</b> | <b>Ranking</b> | <b>Percentage (%)</b> |
|----------------|--|--------------|----------------|-----------------------|
| 1              | Aslib Proceedings  | 321          | 1              | 4.67                  |
| 2              | Library Trends   | 285          | 2              | 4.15                  |
| 3              | Library Quarterly  | 226          | 3              | 3.29                  |
| 4              | Journal of Education for Library and Information Science           | 190          | 4              | 2.76                  |
| 5              | Journal of American Society for Information Science and Technology | 178          | 5              | 2.59                  |
| 6              | Library and Information Science Abstracts                          | 166          | 6              | 2.41                  |
| 7              | IASLIC Bulletin  | 142          | 7              | 2.07                  |
| 8              | Herald of Library Science  | 131          | 8              | 1.91                  |
| 9              | Libri  | 122          | 9              | 1.77                  |
| 10             | Library Science With a slant to Documentation                      | 121          | 10             | 1.76                  |
| 11             | Journal of Academic Librarianship                                  | 120          | 11             | 1.75                  |
| 12             | Annals of Library Science and Documentation                        | 117          | 12             | 1.70                  |
| 13             | American Economic Review   | 112          | 13             | 1.63                  |
| 14             | International Library Review                                       | 107          | 14             | 1.56                  |
| 15             | Annual Review of Information Science & Technology                  | 95           | 15             | 1.38                  |
| 16             | College and Research Libraries                                     | 93           | 16             | 1.35                  |
| 17             | ILA Bulletin   | 79           | 17             | 1.15                  |
| 18             | Special Libraries  | 79           | 17             | 1.15                  |
| 19             | Journal of Information Science                                     | 74           | 18             | 1.08                  |
| 20             | Bulletin of Medical Library Association                            | 72           | 19             | 1.05                  |
| 21             | Library Journal  | 71           | 20             | 1.03                  |
| 22             | Library Management   | 71           | 20             | 1.03                  |
| 23             | Journal of Librarianship and Information Science                   | 68           | 21             | 0.99                  |
| 24             | Library Resources and Technical Services                           | 65           | 22             | 0.95                  |
| 25             | Quarterly Journal of Economics                                     | 64           | 23             | 0.93                  |
| 26             | DESIDOC Bulletin of Information Technology                         | 61           | 24             | 0.89                  |

|    |   |    |    |      |
|----|---|----|----|------|
| 27 | Science   | 61 | 24 | 0.89 |
| 28 | Library Review                                    | 60 | 25 | 0.87 |
| 29 | Information Processing and Management             | 57 | 26 | 0.83 |
| 30 | Library Herald                                    | 57 | 26 | 0.83 |
| 31 | Journal of Library administration                 | 53 | 27 | 0.77 |
| 32 | The Electronic Library                            | 50 | 28 | 0.73 |
| 33 | Library Association Records                       | 49 | 29 | 0.71 |
| 34 | D- Lib Magazine                                   | 48 | 30 | 0.70 |
| 35 | Wilson Library Bulletin                           | 45 | 31 | 0.65 |
| 36 | Drexel Library Quarterly                          | 43 | 32 | 0.63 |
| 37 | Information Technology and Libraries              | 43 | 32 | 0.63 |
| 38 | Journal of Library and Information Science        | 40 | 33 | 0.58 |
| 39 | Review of Economic Studies                        | 40 | 33 | 0.58 |
| 40 | Vayu Mandal                                       | 40 | 33 | 0.58 |
| 41 | IAALD Quarterly                                   | 39 | 34 | 0.57 |
| 42 | Yojana  | 37 | 35 | 0.54 |
| 43 | IFLA  | 36 | 36 | 0.52 |
| 44 | University News                                   | 35 | 37 | 0.51 |
| 45 | Cataloguing and Classification Quarterly          | 34 | 38 | 0.49 |
| 46 | Information Services and Use                      | 32 | 39 | 0.47 |
| 47 | Journal of Political Economy                      | 32 | 39 | 0.47 |
| 48 | Harvard Business Review                           | 30 | 40 | 0.44 |
| 49 | Library Hi Technology                             | 30 | 40 | 0.44 |
| 50 | Daedalus  | 29 | 41 | 0.42 |
| 51 | International Information and Library Review      | 29 | 41 | 0.42 |
| 52 | Computers in Libraries                            | 26 | 42 | 0.38 |
| 53 | Indian Librarian                                  | 26 | 42 | 0.38 |
| 54 | LARR  | 25 | 43 | 0.36 |
| 55 | Scientific American                               | 25 | 43 | 0.36 |
| 56 | Journal of Human Resources                        | 24 | 44 | 0.35 |
| 57 | American Documentation                            | 23 | 45 | 0.33 |
| 58 | Communication of the ACM                          | 23 | 46 | 0.33 |
| 59 | current Research                                  | 22 | 47 | 0.32 |
| 60 | Program   | 21 | 48 | 0.31 |
| 61 | Technical Service Quarterly                       | 21 | 48 | 0.31 |
| 62 | American Libraries                                | 20 | 49 | 0.29 |
| 63 | Economist   | 20 | 49 | 0.29 |
| 64 | OCLC News Letter                                  | 20 | 49 | 0.29 |
| 65 | Canadian Library Journal                          | 19 | 50 | 0.28 |
| 66 | Serials Librarian                                 | 19 | 50 | 0.28 |
| 67 | British Journal of Academic Librarianship         | 18 | 51 | 0.26 |
| 68 | Education for Information                         | 18 | 51 | 0.26 |
| 69 | Assistant Librarian                               | 17 | 52 | 0.25 |
| 70 | American Society for Information Science Bulletin | 16 | 53 | 0.23 |

|     |  |    |    |      |
|-----|--|----|----|------|
| 71  | Biblioca Scientist   | 16 | 53 | 0.23 |
| 72  | Economic Inquiry   | 16 | 53 | 0.23 |
| 73  | Economic Journal   | 16 | 53 | 0.23 |
| 74  | Futurist   | 16 | 53 | 0.23 |
| 75  | Journal of Medical Library Association (JMLA)              | 16 | 53 | 0.23 |
| 76  | Journal of Economic Theory                                 | 16 | 53 | 0.23 |
| 77  | Journal of Law and Economics                               | 16 | 53 | 0.23 |
| 78  | Kurukshetra  | 16 | 53 | 0.23 |
| 79  | Public Finance   | 16 | 53 | 0.23 |
| 80  | World patent Information                                   | 16 | 53 | 0.23 |
| 81  | Annals of Library and Information Studies                  | 15 | 54 | 0.22 |
| 82  | Information Today  | 15 | 54 | 0.22 |
| 83  | Technological Forecasting and Social Change                | 15 | 54 | 0.22 |
| 84  | Canadian Journal of Information and Lib. Sci.              | 14 | 55 | 0.20 |
| 85  | Human Relations  | 14 | 55 | 0.20 |
| 86  | Information scientist                                      | 14 | 55 | 0.20 |
| 87  | International Journal of Human Resource Management         | 14 | 55 | 0.20 |
| 88  | Library Administration and Management                      | 14 | 55 | 0.20 |
| 89  | Advance in Librarianship                                   | 13 | 56 | 0.19 |
| 90  | Annals of American Academy of Political and Socail Science | 13 | 56 | 0.19 |
| 91  | Electronics : Information & Planning                       | 13 | 56 | 0.19 |
| 92  | Fasname-ye ketab   | 13 | 56 | 0.19 |
| 93  | Libraries Unlimited  | 13 | 56 | 0.19 |
| 94  | Library News   | 13 | 56 | 0.19 |
| 95  | Lucknow Librarian  | 13 | 56 | 0.19 |
| 96  | UNESCO Bulletin for Libraries                              | 13 | 56 | 0.19 |
| 97  | Information and Library Manager                            | 12 | 57 | 0.17 |
| 98  | Journal of Washington Academy of Sciences                  | 12 | 57 | 0.17 |
| 99  | Medical Reference Services                                 | 12 | 57 | 0.17 |
| 100 | Sri Lanka Journal of Social Science                        | 12 | 57 | 0.17 |
| 101 | Computing Surveys of ACM                                   | 11 | 58 | 0.16 |
| 102 | E-content (Formerly Database)                              | 11 | 58 | 0.16 |
| 103 | Industry Publications                                      | 11 | 58 | 0.16 |
| 104 | Journal of Management Studies                              | 11 | 58 | 0.16 |
| 105 | Library Philosophy and Practice                            | 11 | 58 | 0.16 |
| 106 | Communication Research Trends                              | 10 | 59 | 0.15 |
| 107 | Industrial and Labour Relation Review                      | 10 | 59 | 0.15 |
| 108 | Information storage and Retrieval                          | 10 | 59 | 0.15 |
| 109 | INICAE   | 10 | 59 | 0.15 |
| 110 | International Journal on Grey Literature                   | 10 | 59 | 0.15 |
| 111 | Knowledge: Creation, Diffusion and Utilization             | 10 | 59 | 0.15 |
| 112 | Online information review                                  | 10 | 59 | 0.15 |
| 113 | Scientometrics   | 10 | 59 | 0.15 |

|     |   |    |    |      |
|-----|---|----|----|------|
| 114 | Studies in Library Management   | 10 | 59 | 0.15 |
| 115 | Unesco Journal of Information Science, Librarianship and Archive Administration | 10 | 59 | 0.15 |
| 116 | Academy of Management Journal   | 9  | 60 | 0.13 |
| 117 | Administrative Science Quarterly  | 9  | 60 | 0.13 |
| 118 | Campus wide Information Systems   | 9  | 60 | 0.13 |
| 119 | Communications Research B   | 9  | 60 | 0.13 |
| 120 | Computers and Education   | 9  | 60 | 0.13 |
| 121 | International Information Communication and Education                           | 9  | 60 | 0.13 |
| 122 | International Journal of Geographic Information systems                         | 9  | 60 | 0.13 |
| 123 | Librarian and book world  | 9  | 60 | 0.13 |
| 124 | Library Acquisition, Practice and Theory  | 9  | 60 | 0.13 |
| 125 | Library and Information Science Research  | 9  | 60 | 0.13 |
| 126 | Library Software  | 9  | 60 | 0.13 |
| 127 | Oxford Bulletin of Economics and Statistics                                     | 9  | 60 | 0.13 |
| 128 | Serial Review   | 9  | 60 | 0.13 |

*Table 6.17 Ranking of Journals in LIS*

**Observation:-** Among 670 journals contribute to the 6874 citations in this research study. Table 6.16 lists the titles of core journals and their corresponding number of citations. Core journal titles are identified based on rank and found that first 25 ranked journals contribute 3351 citations (48.83%). There are 30 journals which counts 3665 citations (53.31%) and accounts for 50% coverage of citations. Remaining 636 journals has 3209 (46.68%) citations. Thus the first 25 to 30 journals are covering 50% need of the users. These can be considered as core journals in the area based on ranking of citations. Table 6.16 indicates the title, rank and citations etc. The most cited journal is ASLIB Proceedings with 321 citations, followed by *Library Trends* with 285 citations, JASIST on fourth rank with 178 citations.

### **6.20 Bradford's Law of Scattering:-**

Bradford's law states that "If scientific periodicals are arranged in order of decreasing productivity of articles on a given subject that may be divided into a nucleus of periodicals more particularly devoted to the subject and several groups or zones containing the same number of articles as the nucleus when the number of periodicals in the nucleus and succeeding zones will be as 1:n:n<sup>2</sup>.

The graphical presentation of Bradford's Law of Scattering was applied to citations in the present LIS study. Table No. 1.5.4 lists journals in decreasing frequency of citations. For

testing the applicability of Bradford's Law of Scattering, a graph was plotted by taking the cumulative number of citations on y-axis and log of cumulative number of journals on x-axis. The curve starts rising exponentially and then linearly indicating that the data fits Bradford's Law.

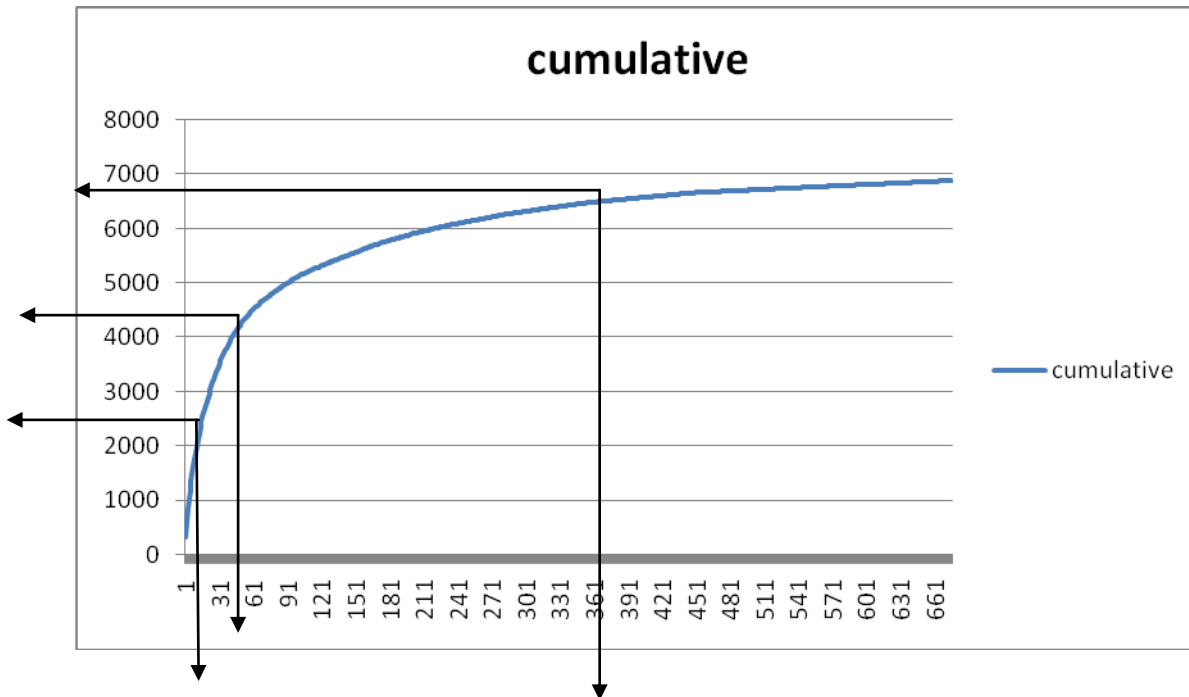


Figure 6.11 Bradford's Law of Scattering

**Observation:** From the graph it is observed that experimental covers is closely associated with theoretical line up to 6700 citations and then start dropping. The citations were grouped in to three zones of 2219, 4381, 6576. Sudhier (2010), had also conducted similar types of studies and satisfied the Bradford's law.

### 6.21 Ranking of Research Topics (Awarded):-

| Keywords                           | count | Ranking | Percentage (%) |
|------------------------------------|-------|---------|----------------|
| Academic Libraries                 | 39    | 1       | 25.66          |
| Reference and Information services | 14    | 2       | 9.21           |



|                                     |     |    |      |
|-------------------------------------|-----|----|------|
| Special Library                     | 13  | 3  | 8.55 |
| Information Seeking behaviour       | 10  | 4  | 6.58 |
| Bibliometrics and Citation Analysis | 9   | 5  | 5.92 |
| Public Library                      | 9   | 5  | 5.92 |
| ICT                                 | 5   | 6  | 3.29 |
| Library Networks                    | 5   | 6  | 3.29 |
| Library Education and Curriculum    | 4   | 7  | 2.63 |
| Cataloguing                         | 3   | 8  | 1.97 |
| Internet                            | 3   | 8  | 1.97 |
| Library Management                  | 3   | 8  | 1.97 |
| Classification                      | 2   | 9  | 1.32 |
| Digital Library                     | 2   | 9  | 1.32 |
| Digitization                        | 2   | 9  | 1.32 |
| Grey literature                     | 2   | 9  | 1.32 |
| Information System                  | 2   | 9  | 1.32 |
| Librarianship                       | 2   | 9  | 1.32 |
| Library Legislation                 | 2   | 9  | 1.32 |
| Patent literature                   | 2   | 9  | 1.32 |
| Standards                           | 2   | 9  | 1.32 |
| Use study: e-journal                | 2   | 9  | 1.32 |
| Vocabulary Control                  | 2   | 9  | 1.32 |
| Web tools                           | 2   | 9  | 1.32 |
| Abstracting and Indexing            | 1   | 10 | 0.66 |
| Bibliographic databases             | 1   | 10 | 0.66 |
| Case study of Libraries             | 1   | 10 | 0.66 |
| Content Management                  | 1   | 10 | 0.66 |
| Geographic Information              | 1   | 10 | 0.66 |
| HRD                                 | 1   | 10 | 0.66 |
| Knowledge Management                | 1   | 10 | 0.66 |
| Library Association                 | 1   | 10 | 0.66 |
| Manuscripts                         | 1   | 10 | 0.66 |
| Staffing Pattern                    | 1   | 10 | 0.66 |
| Subject heading                     | 1   | 10 | 0.66 |
|                                     | 152 |    | 100  |

*Table 6.18 Ranking of Research Topics (Awarded)*

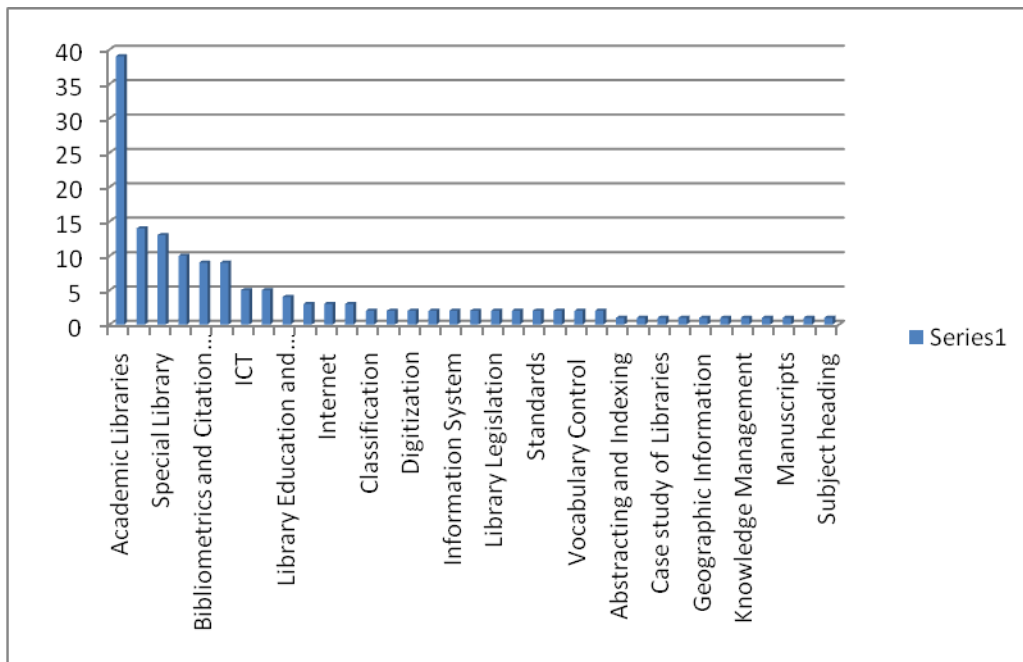


Figure 6.12 Ranking of Research Topics (Awarded till 2010)

**Observation:-** It is observed that the research conducted so far in LIS covers mainly traditional concepts. The ranking of subjects revealed that academic libraries, reference services, information services, special libraries, ISB, citation analysis are prominent areas in which research studies have been conducted more. It is also observed that few studies covering latest trends in profession like ICT, library networks, internet, digital library etc. are also reflected since 2000 onwards. The table 6.17 elaborates the topic covered by the researchers in LIS from different universities in western India.

### 1.22 Ranking of Research Topics (Ongoing):-

| <b>Keywords</b>                     | <b>Count</b> | <b>Ranking</b> | <b>Percentage (%)</b> |
|-------------------------------------|--------------|----------------|-----------------------|
| Special Libraries                   | 33           | 1              | 24.26                 |
| Academic Library                    | 29           | 2              | 21.32                 |
| Bibliometrics and Citation Analysis | 9            | 3              | 6.62                  |
| Public Libraries                    | 7            | 4              | 5.15                  |
| Information Seeking behaviour       | 5            | 5              | 3.68                  |
| Bibliographic Databases             | 4            | 6              | 2.94                  |
| Open Access Initiative              | 4            | 6              | 2.94                  |
| Information Literacy                | 3            | 7              | 2.21                  |
| LIS Education                       | 3            | 7              | 2.21                  |
| Resources Sharing                   | 3            | 7              | 2.21                  |
| Classification                      | 2            | 8              | 1.47                  |
| Content Analysis                    | 2            | 8              | 1.47                  |
| e-resources                         | 2            | 8              | 1.47                  |
| Information Centres                 | 2            | 8              | 1.47                  |
| Information Retrieval system        | 2            | 8              | 1.47                  |
| IPR                                 | 2            | 8              | 1.47                  |
| Library Network                     | 2            | 8              | 1.47                  |
| Metadata                            | 2            | 8              | 1.47                  |
| Digital Divide                      | 1            | 9              | 0.74                  |
| Digital Library                     | 1            | 9              | 0.74                  |
| Digitization                        | 1            | 9              | 0.74                  |
| ICT                                 | 1            | 9              | 0.74                  |
| Information Gateway                 | 1            | 9              | 0.74                  |
| Information services                | 1            | 9              | 0.74                  |
| Internet                            | 1            | 9              | 0.74                  |
| Knowledge Management                | 1            | 9              | 0.74                  |
| Library Automation                  | 1            | 9              | 0.74                  |
| Library Services                    | 1            | 9              | 0.74                  |
| Library Software                    | 1            | 9              | 0.74                  |
| Library Building                    | 1            | 9              | 0.74                  |
| Online Information Services         | 1            | 9              | 0.74                  |
| Staff Pattern                       | 1            | 9              | 0.74                  |
| Thesaurus                           | 1            | 9              | 0.74                  |
| Traditional Knowledge               | 1            | 9              | 0.74                  |
| LIS Trends                          | 1            | 9              | 0.74                  |
| User Education                      | 1            | 9              | 0.74                  |
| Web Technology                      | 1            | 9              | 0.74                  |
| Use Study Literature                | 1            | 9              | 0.74                  |
|                                     | 136          |                | 100.00                |

*Table 6.19 Ranking of Research Topics (Ongoing)*

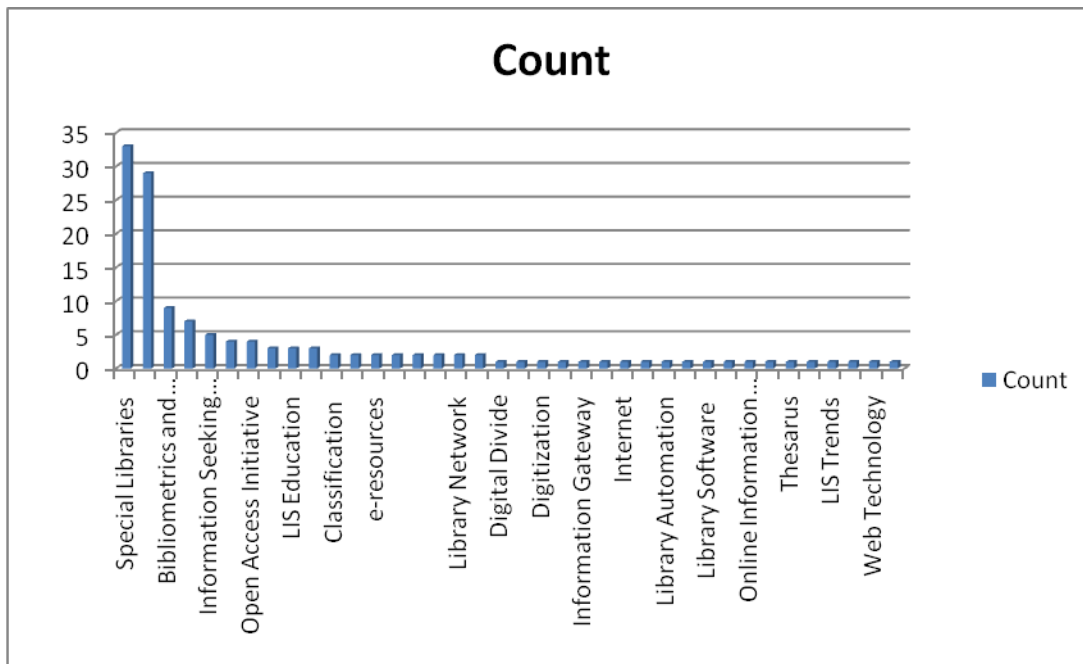


Figure 6.13 Ranking of Research Topics (Ongoing)

**Observation:-** the status of ongoing research pointed out that the research is covering the latest trends more in the area like open access, software's, library management software's, information literacy, resources sharing, content analysis, IPR, metadata, digital library, information gateway, web technology etc. along with traditional areas. This is very good sign in LIS research.

### 6.23 Ranking of URL's:-

| Sr. No. | URL/ Websites   | Count | Ranking | Percentage (%) |
|---------|---|-------|---------|----------------|
| 1       | <a href="http://www.ala.org/lita/litpublications/late/2101coyle.htm">http://www.ala.org/lita/litpublications/late/2101coyle.htm</a>                             | 8     | 1       | 0.97           |
| 2       | <a href="http://www.dlib.org/dlib/may99/payette/05payett.html">http://www.dlib.org/dlib/may99/payette/05payett.html</a>   | 8     | 1       | 0.97           |
| 3       | <a href="http://larry.masinter.net/docweplib.html">http://larry.masinter.net/docweplib.html</a>   | 8     | 1       | 0.97           |
| 4       | <a href="http://www.webjunction.org/do/displayContent?=">http // www web junction. org/do/display Content?="</a>  | 8     | 1       | 0.97           |
| 5       | <a href="http://www.ala.org/ala/lethal/litapublicationsfnad/2101bretthauer.htm">http // www. ala. org/ala/lethal/ litapublicationsfnad/ 2101 bretthauer.htm</a> | 8     | 1       | 0.97           |
| 6       | <a href="http://www.infoday.com/climax/sep04/balsa.shiml">http //www. Info today. Com/ climax/ sep04 /balsa. shiml.</a>   | 8     | 1       | 0.97           |
| 7       | <a href="http://www.istl.ort/05-spring/article2html">http://www.istl.ort/05-spring/article2html</a>   | 8     | 1       | 0.97           |
| 8       | <a href="http://dlist.sir.arizona.edu/922/">http://dlist.sir.arizona.edu/922/.</a>  | 8     | 1       | 0.97           |
| 9       | <a href="https://drct.isibang.acin/handle/1849/190">https://drct.isibang.acin/handle/1849/190</a>   | 8     | 1       | 0.97           |
| 10      | <a href="http://www.delnet.nic.in">http://www.delnet.nic.in</a>   | 6     | 2       | 0.73           |
| 11      | <a href="http://www.oclc.org/home">http://www.oclc.org/home</a>   | 6     | 2       | 0.73           |
| 13      | <a href="http://www.nic.bnc.ca/pubs/netnotes/notes14.html">http, //www. nic. bnc. ca/pubs/net notes/notes14.html</a>  | 5     | 3       | 0.61           |
| 14      | <a href="http://www.library.cornell.edu/preservation/">http://www.library.cornell.edu/preservation/</a>   | 5     | 3       | 0.61           |

|    |   |   |   |      |
|----|---|---|---|------|
|    | conservation.html   |   |   |      |
| 15 | <a href="http://www.nedcc.org/digital/dman.pdf">http://www.nedcc.org/digital/dman.pdf</a>   | 5 | 3 | 0.61 |
| 16 | <a href="http://www.csd.tamu.edu/DL97paper/umd.html">http://www.csd.tamu.edu/DL97paper/umd.html</a>   | 5 | 3 | 0.61 |
| 17 | <a href="http://memory.loc.gov/aments/formats/html">http://memory.loc.gov/aments/formats/html</a>   | 5 | 3 | 0.61 |
| 18 | <a href="http://Howard/papers/amia-longevity.html">http://Howard/papers/amia-longevity.html</a>   | 5 | 3 | 0.61 |
| 19 | <a href="http://www.unesco.org/">http://www.unesco.org/</a>   | 5 | 3 | 0.61 |
| 20 | <a href="http://africandl.org/bestprac/audio/audio.html">http://africandl.org/bestprac/audio/audio.html</a>   | 5 | 3 | 0.61 |
| 21 | <a href="http://ahds.ac.uk/manage/teamwork">http://ahds.ac.uk/manage/teamwork</a>   | 5 | 3 | 0.61 |
| 22 | <a href="http://jpw.umd.umich.edu/pubs/japan-1999.html">http://jpw.umd.umich.edu/pubs/japan-1999.html</a>   | 5 | 3 | 0.61 |
| 23 | <a href="http://www.ljdigital.com/articles/infotech/digitallibraries/19980915_3446.asp">http://www.ljdigital.com/articles/infotech/digitallibraries/19980915_3446.asp</a> | 5 | 3 | 0.61 |
| 24 | <a href="http://www.rig.org/preserve/dipres.html">http://www.rig.org/preserve/dipres.html</a>   | 5 | 3 | 0.61 |
| 25 | <a href="http://www.aiaa.org/2004/paper.htm">http://www.aiaa.org/2004/paper.htm</a>   | 5 | 3 | 0.61 |
| 26 | <a href="http://www.aiaa.org/2004/papers.htm">http://www.aiaa.org/2004/papers.htm</a>   | 5 | 3 | 0.61 |
| 27 | <a href="http://www.clir.org/programs/hybrid.pdf">http://www.clir.org/programs/hybrid.pdf</a>   | 5 | 3 | 0.61 |
| 28 | <a href="http://www.clir.org/pubs/abstract/pub71.html">http://www.clir.org/pubs/abstract/pub71.html</a>   | 5 | 3 | 0.61 |
| 29 | <a href="http://www.clir.org/pubs/reports/hazen/pub74.html">http://www.clir.org/pubs/reports/hazen/pub74.html</a>   | 5 | 3 | 0.61 |
| 30 | <a href="http://www.clir.org/pubs/reports/pub80-smith/pub80.html">http://www.clir.org/pubs/reports/pub80-smith/pub80.html</a>   | 5 | 3 | 0.61 |
| 31 | <a href="http://www.clir.org/pubs/reports/rotherberg/context.html">http://www.clir.org/pubs/reports/rotherberg/context.html</a>   | 5 | 3 | 0.61 |
| 32 | <a href="http://www.dlib.org/dlib/">http://www.dlib.org/dlib/</a>   | 5 | 3 | 0.61 |
| 33 | <a href="http://www.dlib.org/dlib/september99/09lynch.html">http://www.dlib.org/dlib/september99/09lynch.html</a>   | 5 | 3 | 0.61 |
| 34 | <a href="http://www.ied.edu.hk/has/webauth/4hkws/">http://www.ied.edu.hk/has/webauth/4hkws/</a>   | 5 | 3 | 0.61 |
| 35 | <a href="http://www.ifla.org/VI/5/op/udtop8/udtop8.htm">http://www.ifla.org/VI/5/op/udtop8/udtop8.htm</a>   | 5 | 3 | 0.61 |
| 36 | <a href="http://www.library.html/libraries/law/digit.html">http://www.library.html/libraries/law/digit.html</a>   | 5 | 3 | 0.61 |
| 37 | <a href="http://www.ljdigital.com/articles/infotech/digitallibraries/19990215_4175.asp">http://www.ljdigital.com/articles/infotech/digitallibraries/19990215_4175.asp</a> | 5 | 3 | 0.61 |
| 38 | <a href="http://www.nara.gov/nara/vision/eap/digiguide.pdf">http://www.nara.gov/nara/vision/eap/digiguide.pdf</a>   | 5 | 3 | 0.61 |
| 39 | <a href="http://www.nedec.org/plam3/tieaf_54.html">http://www.nedec.org/plam3/tieaf_54.html</a>   | 5 | 3 | 0.61 |
| 40 | <a href="http://www.nia.gov.au/nia/staffpaper/cwebb3.html">http://www.nia.gov.au/nia/staffpaper/cwebb3.html</a>   | 5 | 3 | 0.61 |
| 41 | <a href="http://www.nsf.gov/pubs/stis1993/nsf93141/nsf93141.txt">http://www.nsf.gov/pubs/stis1993/nsf93141/nsf93141.txt</a>   | 5 | 3 | 0.61 |
| 42 | <a href="http://www.rig.org/preserv/joint/day.html">http://www.rig.org/preserv/joint/day.html</a>   | 5 | 3 | 0.61 |
| 43 | <a href="http://www.rlg.org/preserv/diginews/diginews3-3.html#feature">http://www.rlg.org/preserv/diginews/diginews3-3.html#feature</a>                                   | 5 | 3 | 0.61 |
| 44 | <a href="http://www.rlg.org/Archtf">http://www.rlg.org/Archtf</a>   | 5 | 3 | 0.61 |
| 45 | <a href="http://www.thamesrig.org/preserve/joint/ayris.html">http://www.thamesrig.org/preserve/joint/ayris.html</a>   | 5 | 3 | 0.61 |
| 46 | <a href="http://www.ukoln.ac.uk/services/papers/bl/blri109/">http://www.ukoln.ac.uk/services/papers/bl/blri109/</a>   | 5 | 3 | 0.61 |
| 47 | <a href="http://www.ukoln.ac.uk/metadata/presentations/ecdl2001-day/paper.html">http://www.ukoln.ac.uk/metadata/presentations/ecdl2001-day/paper.html</a>                 | 5 | 3 | 0.61 |
| 48 | <a href="http://www.uky.edu/DL/hedstrom">http://www.uky.edu/DL/hedstrom</a>   | 5 | 3 | 0.61 |
| 49 | <a href="http://www.dibn.org/dibApril96/cnri/">http://www.dibn.org/dibApril96/cnri/</a>   | 5 | 3 | 0.61 |
| 50 | <a href="http://www.dlib.org/dlib/june98/cnri/bear.html">http://www.dlib.org/dlib/june98/cnri/bear.html</a>   | 5 | 3 | 0.61 |
| 51 | <a href="http://www.dii.org/libcnri/Boll.html">http://www.dii.org/libcnri/Boll.html</a>   | 5 | 3 | 0.61 |

|    |   |   |   |      |
|----|---|---|---|------|
| 52 | <a href="http://www.library.conell.edu/preservation/dila.html">http://www.library.conell.edu/preservation/dila.html</a>   | 5 | 3 | 0.61 |
| 53 | <a href="http://www.dlib.org/dlib/feb/00/kingma/02kingma.html">http://www.dlib.org/dlib/feb/00/kingma/02kingma.html</a>   | 5 | 3 | 0.61 |
| 54 | <a href="http://www.ukoln.ac.uk/services">http://www.ukoln.ac.uk/services</a>   | 5 | 3 | 0.61 |
| 55 | <a href="http://www.clir.org/pubs/reports/lesk.html">http://www.clir.org/pubs/reports/lesk.html</a>   | 5 | 3 | 0.61 |
| 56 | <a href="http://www.clir.org/pubs/reports/lesk1/lesk2.html">http://www.clir.org/pubs/reports/lesk1/lesk2.html</a>   | 5 | 3 | 0.61 |
| 57 | <a href="http://www.sciam.com/0397issue/03977lesk.html">http://www.sciam.com/0397issue/03977lesk.html</a>   | 5 | 3 | 0.61 |
| 58 | <a href="http://www.dlib.org/October00/granger/10granger.html">www.Dlib.org /October00/granger/10granger.html</a>   | 5 | 3 | 0.61 |
| 59 | <a href="http://www.istl.org/98-spring/article4.html">http://www.istl.org/98-spring/article4.html</a>   | 4 | 4 | 0.48 |
| 60 | <a href="http://www.dest.gov.au/NR/rdonlyers/C251724A-IE09-4954-BFBE-FDA5836375E3/4508/technology.pdf">http://www.dest.gov.au/NR/rdonlyers/C251724A-IE09-4954-BFBE-FDA5836375E3/4508/technology.pdf</a>   | 3 | 5 | 0.36 |
| 61 | <a href="http://firstmonday.org/issues/issue10_9/jones/Index.html">http://firstmonday.org/issues/issue10_9/jones/Index.html</a>   | 3 | 5 | 0.36 |
| 62 | <a href="http://ifla.inist.fr/">http://ifla.inist.fr/</a>   | 3 | 5 | 0.36 |
| 63 | <a href="http://meria.idc.ac.il/journal2003/issue3/jvol7no3in.html">http://meria.idc.ac.il/journal2003/issue3/jvol7no3in.html</a>   | 3 | 5 | 0.36 |
| 64 | <a href="http://sunsite.Berkeley.edu/ucdl/">http://sunsite.Berkeley.edu/ucdl/</a>   | 3 | 5 | 0.36 |
| 65 | <a href="http://ukoln.bath.ac.uk/elib/:Electronic">http://ukoln.bath.ac.uk/elib/:Electronic</a>   | 3 | 5 | 0.36 |
| 66 | <a href="http://web.njit.edu/~hiltz/">http://web.njit.edu/~hiltz/</a>   | 3 | 5 | 0.36 |
| 67 | <a href="http://www.ala.org/">http://www.ala.org/</a>   | 3 | 5 | 0.36 |
| 68 | <a href="http://www.alibnet.org/">http://www.alibnet.org/</a>   | 3 | 5 | 0.36 |
| 69 | <a href="http://www.angelfire.com/in/mailbnet/">http://www.angelfire.com/in/mailbnet/</a>   | 3 | 5 | 0.36 |
| 70 | <a href="http://www.apett.org/docs/events/KoreaReport.doc">http://www.apett.org/docs/events/KoreaReport.doc</a>   | 3 | 5 | 0.36 |
| 71 | <a href="http://www.bids.ac.uk/">http://www.bids.ac.uk/</a>   | 3 | 5 | 0.36 |
| 72 | <a href="http://www.blaiseweb.li.uk/">http://www.blaiseweb.li.uk/</a>   | 3 | 5 | 0.36 |
| 73 | <a href="http://www.bytesforall.org/Egovernance/html/ITin_Nepal.pdf">http://www.bytesforall.org/Egovernance/html/ITin_Nepal.pdf</a>   | 3 | 5 | 0.36 |
| 74 | <a href="http://www.calibnet.org/">http://www.calibnet.org/</a>   | 3 | 5 | 0.36 |
| 75 | <a href="http://www.delnet.nic.in/">http://www.delnet.nic.in/</a>   | 3 | 5 | 0.36 |
| 76 | <a href="http://www.fbs.d211.org/departments/be/amiller/Action-Research_Project/index.htm">http://www.fbs.d211.org/departments/be/amiller/Action-Research_Project/index.htm</a>   | 3 | 5 | 0.36 |
| 77 | <a href="http://www.ifla.org/TV/ifla70/prog04.htm">http://www.ifla.org/TV/ifla70/prog04.htm</a>   | 3 | 5 | 0.36 |
| 78 | <a href="http://www.irandoc.ac.ir/Data/Books/it_strategy/karmia_4_e.pdf">http://www.irandoc.ac.ir/Data/Books/it_strategy/karmia_4_e.pdf</a>   | 3 | 5 | 0.36 |
| 79 | <a href="http://www.itcompany.com">http://www.itcompany.com</a>   | 3 | 5 | 0.36 |
| 80 | <a href="http://www.jstor.org">http://www.jstor.org</a>   | 3 | 5 | 0.36 |
| 81 | <a href="http://www.library.iitb.ac.in/indest">http://www.library.iitb.ac.in/indest</a>   | 3 | 5 | 0.36 |
| 82 | <a href="http://www.loc.gov/">http://www.loc.gov/</a>   | 3 | 5 | 0.36 |
| 83 | <a href="http://www.nla.gov.au/ilrs/about.html">Http://www.nla.gov.au/ilrs/about.html</a>   | 3 | 5 | 0.36 |
| 84 | <a href="http://www.rlf.org/">http://www.rlf.org/</a>   | 3 | 5 | 0.36 |
| 85 | <a href="http://www.unescap.org/icstd/events/WSIS_2nd_Phase/docs/Tehran/Key/Noteaddresses-statements/National_ICT_Report_Iran.pdf">http://www.unescap.org/icstd/events/WSIS_2nd_Phase/docs/Tehran/Key/Noteaddresses-statements/National_ICT_Report_Iran.pdf</a> | 3 | 5 | 0.36 |
| 86 | <a href="http://www.unescobkk.org/fileadmin/user_upload/ict/Metasurvey/IRANPDF">http://www.unescobkk.org/fileadmin/user_upload/ict/Metasurvey/IRANPDF</a>   | 3 | 5 | 0.36 |
| 87 | <a href="http://carbon.cudenver.edu/~sherry/pubs/maddux.html">http://carbon.cudenver.edu/~sherry/pubs/maddux.html</a>   | 3 | 5 | 0.36 |
| 88 | <a href="http://udg.es/ties/orals/c17.pdf">udg.es/ties/orals/c17.pdf</a>  | 3 | 5 | 0.36 |

|    |              |   |   |      |
|----|--------------|---|---|------|
| 89 | www.ifa.org: | 3 | 5 | 0.36 |
|----|--------------|---|---|------|

*Table 6.20 Ranking of URLs*

**Observation:-** Researchers in LIS are now using internet based resources along with print. The analysis of used sites is presented in table 6.19. ALA, DLIB, INFOTODAY, DRTC, OCLC, DELNET, NIC, LC, UNESCO, IFLA are the prominent sites used by the researchers.

**Summary:** This chapter presents the detailed analysis and overview of LIS research activity conducted in universities of western zone in India. The analysis of data helped in finding many significant facts. The observations noticed in this study are useful for building findings and suggestions. The data analysis presented in this chapter fulfil the objectives “to study use of different information sources consulted and cited by LIS scholars while conducting research study” and “identification of cited sources and its ranking” This study also simultaneously proved the hypothesis positively “PhD students prefer periodical literature while conducting research study than other sources and now use of web and internet sources are also used by the researchers”. The trends reflected in this zone are matching with the national trends.

## Chapter 7: Findings, Suggestions and Conclusion

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## ***7.1 Introduction:-***

While conducting this study it was observed that enormous growth in LIS education and research has been taken place since past ten years. Initially though the efforts were slow but since applications of ICT and management techniques in LIS the growth is more in research activity and also has diversified areas for research. The importance of research in LIS is visualized since 1950s and initially research work carried out in this area was having slow pace but since 2000 onwards steady rise in research activity is visualized. At present research element is introduced at M Phil and PhD level programs in most of the universities. The main purpose of initiation of research activity is mainly to solve the problems in librarianship. In the present study researcher has analysed and reviewed status of LIS research at national level and in particular universities from the western part of India. Based on the literary evidences and factual data analysis, researcher observed the trends and progress in LIS research. The findings from the analytical study are listed as well few suggestions are recorded to improve the LIS research.

## ***7.2 Findings:-***

The analytical study of citations from PhD (LIS) theses revealed many findings. These findings have thrown light on the variety of information sources on which the research scholars depends on heavily. The prominent findings sought from the study are presented below covering national, western Indian universities and in general.

### ***7.2.1 National Level:-***

1. The credit for introduction of research degree program in LIS in India goes to Dr. S R Ranganathan who started research program at Delhi University in 1958. The first doctoral degree in library science honoured to D B Krishnrao for his research work “Facet analysis and depth classification of agriculture” under the guidance of Dr. Ranganathan.
2. Later many universities initiated research program including DRTC, NISCAIR, UGC, NASSDOC and Library Associations in India like ILA, IASLIC, IATLIS etc and they have also supported for research activity and assisted in conducting and publishing research outcome. Further University Grants Commission (UGC) has promoted LIS research by awarding different kinds of fellowships. ICSSR and DESIDOC have also taken active part in

LIS research program and supported doctoral research by awarding scholarships to researchers.

3. From 1957 to 2008 about 802 doctoral degrees were awarded by the various Indian universities. From 1957 to 1990 on an average only 8 degrees were awarded per annum. Since 1991 the steady rise is reported in research activity and 1991-2008 on an average 36 doctoral degrees were awarded. This magnitude of change is visualized due to merging of new technology and management techniques in LIS. However from 2003 onwards more research is reported and during the period 2003-08 in five years on an average 43 degrees awarded per annum by the Indian universities.

4. The analysis of degrees awarded by the different universities in India in LIS, among them top 10 states in India, Karnataka stands first. The rank wise status of research in different states awarding degrees by the end of 2008 were Karnataka (169), AP (96), MP (80), Maharashtra (68), West Bengal (56), Panjab (45), Orissa (43), UP (42), Rajasthan (41), Tamil Nadu (31) and other state's contribution is 141 degrees. Karnataka and Maharashtra state are leading in research activity.

5. It is observed that research conducted in Indian universities is more biased towards bibliometrics and citation analysis, library management, university library, information seeking behaviour, library services, information technology, public library, college library, special library and Library science education etc. Thus more than 50% research (493) degrees in Indian universities were awarded in these research areas.

6. Analysing the contribution of research guide at national level Dr. C R Karisiddappa from Dharwad University stands first and under his guidance about 33 research students received the degrees by 2008. Dr. PSG Kumar, Dr. Sangam, Dr. Ramesh Babu, Dr. R M Kumbhar, Dr. V G Talwar are the major contributors as guiding professors to researchers at national level.

7. The comparison of research at global level also highlighted the same trend as reflected in Indian universities except research based on current trends are reflected earlier than Indian scenario.

### ***7.2.2 Western Indian Universities Level:-***

The researcher has collected the data from research contributions of research work submitted to universities located in part of western India i.e. Maharashtra, Gujrat and Goa. The citations data was collected from the research theses by visiting universities and refereeing the theses which were made available. The analysis of data helped in findings major observation in LIS research conducted in this area and the major findings traced out are reported below.

1. Western zone of India has three states (Maharashtra, Goa and Gujrat) and 21 non agriculture universities. But the research activity is carried out only in 14 universities.
2. Out of the three states Goa state has only one university but as on today only LIS education is prominent and research activity is not yet started hence research output is not available from this university. Now in all 21 universities (Maharashtra 12 and Gujrat 9) where research activity in LIS is contributed i.e. in progress and in nearer future degrees might be awarded..
3. From these 21 universities during the period 1980 to 2010, 152 doctoral degrees were awarded. This research magnitude is from 14 universities and in remaining 7 universities ongoing research is reflected and not yet awarded doctoral degrees till 2010 (North Maharashtra University Jalgaon, Tilak Maharashtra Vidyapeeth Pune, Bharati Vidyapeeth Pune, Sourashtra university, Rajkot, south Gujrat university Surat, Gujrat University, Ahmadabad). However Bharati vidyapeeth Pune has recently awarded around 3 degrees to researchers.
4. The status of research in western Indian universities indicated, university of Pune ranks first by awarding 57 doctoral degrees at the end of 2010. Next is Nagpur university (32), BAMU Aurangabad (15), Amravati university (11) etc.
5. Maharashtra state is at leading position awarding 136 degrees. Whereas Gujrat state has only 16 doctoral degrees awarded so far. At national level Maharashtra ranks 4<sup>th</sup> but in western Indian universities Maharashtra leading at top.
6. The research element in western part initiated late 80's (at national level 1957) and first degree awarded in 1986. The first degree awarded in Maharashtra is to Dr. M B Konnur in 1986 from University of Pune. Where as in Gujrat first degree was awarded to Dr Bhawsar Vaishaliben in 2000. There is a gap of nearly 30 years as compared to national level in Maharashtra and nearly 44 years in Gujrat. Thus initial growth was slow by awarding only 1 degree per annum but since 1997-2001 around 5 degrees awarded per annum but real growth of research is reported since 2002 and

during the period 2001-10, 119 theses were accepted for awarding degrees. The Gujrat state has slow but steady progress in research activity.

7. The research conducted in these universities revealed that academic library, information services, special library, information seeking behavior, citation analysis, public library, ICT applications, digital library are the major subject areas covered by research from these states. The research topics selected also has similarity at national level. More than 50% research work was related to academic library, information service, special library, information seeking behavior, and citation analysis. However the upcoming areas like ICT, library network, library science education and curriculum are considered in this area.
8. Ranking of guides in this zone revealed that Dr. PSG Kumar stand first (31) followed by Dr. Rajyalakshmi D (11), Dr. N J Deshpande (10), Dr. S K Patil (9) these are the major research guide in this area but Dr. Kumar rank first in Maharashtra and also has second rank at national level. He is the most imminent personality as national level as well as state level guidance. It is also reflected that Dr. Konnur, Dr. Ganpule, Dr. Mahajan, Dr. Riswadkar, Dr. Vaishnav are also popular guides. Dr Rawal, Dr Charan, Dr Vyas, are the prominent guides from the Gujrat states.
9. Researcher has also reviewed ongoing research topics and noticed that academic library, information services, special library, information seeking behavior, citation analysis studies, public library are again at leading position in research activity. But ICT, library network, digital library, information service, IPR, web technology, HRD, knowledge management, staffing pattern are new areas reported in the ongoing research in both states.
10. From the analysis of guides it is reflected that new research guides are also included in the panel to manage increased load of research enrolment in the area of LIS, and found about 29 research guides are guiding to 136 research students in LIS in these states. Among the first 10 prominent guides which are newly registered are Dr. Dakhole P S, Dr. Kale K B, Dr. Deshpande R M, Dr. Hirwade M A, Dr. Dahibhate N B, Dr. Namita Khot etc. In Gujrat Dr Shyama Rajaram, Dr Charan, Dr Vyas, Dr Thaker are representing as prominent guides.
11. Ongoing research activity is reported highest at Nagpur university (72) followed by Tilak Maharashtra Vidyapeeth (25), University of Pune (17). It is also observed that new universities are also leading at ongoing research activity.

### ***7.2.3 Findings Form Data Analysis:-***

- 1) It is found that many theses are presented in local language and the researchers experience language barrier in the use of the document, e.g. in Gujrat universities theses submitted are in Gujrati language and in Maharashtra in Marathi language. These might be the barriers for other state researchers.
- 2) It is observed that there are many information sources for PhD thesis data like AIU Handbook, University News Letters, INFLIBNET database, Vidyanidhi, Shodhganga etc. But the data is not complete in any of the source to get the complete data or information regarding the research activity. There is a need to having unique source of compilation. It is also possible to link theses databases at international level. This helps in identifying total number of degrees, year, name of guide, topics of research studies and such data helps in avoiding duplication in research as well as authentication of data.
- 3) From the data analysis it is observed that, in the research studies, researchers use different scholarly information resources to justify the results and hence they refer and cite the used references in their study. Researchers in LIS have used variety of forms and formats of publications that were being cited by the researchers in their study. The most frequently cited form was journals followed by books. Librarians need to focus on these two types of bibliographic forms while subscribing information that fulfills the needs of the LIS researchers for their research. The survey highlighted the use of literature in which journal usage is more than other resources. This is the normal trend observed among researchers everywhere in all subjects as journals are the primary source of information in which qualitative information is reported. The other prominent contribution is books, websites, proceedings and theses. It is revealed from this study that journals, books and electronics media are the most used literature forms while preparation of dissertations by PhD research scholars in LIS. These three forms of information resources cover almost 89% of the total citations. Nearly half of the citations are of journal articles (42.14%), followed by books (41.75%) and electronic media (5.06%). Conferences and theses / dissertations follow closely to 6.60%. The other categories, includes grey literature covering reports, lectures seminars, brochures, annual reports patrikas, technical reports, government publications, newspapers, reference sources like encyclopedia, dictionaries, etc and counts for 4.40% of the citations.

- 4) Earlier only printed information sources were available for consultation but now due to use of ICT and e-forms of documents researchers are using e-resources available in the form of e-books, e-journals and internet based information resources. The use of e-resources is increasing slowly in the research workers, as availability and use of e-resources is economical and fast to distribute and link. The trend in citing e-documents is also reflected in research studies. In the study about 6% uses of e-resources is reflected. In natural sciences more use of e-resources is reflected as more data is available in e-form including databases, whereas in social sciences now the growth of e-resources is increasing and researchers are making use of it.. However print resource have dominance in its use due availability.
- 5) It is observed that LIS researchers are using LIS resources while conducting research study but they are also consulting to the non-LIS journal resources. It is observed that researchers while conducting studies used 193 LIS journals where as researcher have also used non LIS professional journals devoted to different branches of knowledge, due to multi-disciplinary concepts, librarians and information scientists are publishing their views even in non LIS journals as articles covers specific subject relation studies.
- 6) Researchers in LIS used 193 journals in conducting research studies and ASLIB proceedings, Library Trends etc are being used prominently in the studies. Use of abstracting journals are also reflected in the study and it is a very good sign of conducting literature research.
- 7) The analysis of chronological distribution of citation indicated the pattern of literature being used in research studies. The data indicated that the highest percentage of citations cited in the research study are ranging from 1981 to 1990 (29.27%) followed by 1991-2000 (20.05%). It is also observed that 12.74% citations are reported from the period 1966-75, whereas only 10.8% citations are reported for the current nine years 2001-2009. The trend in use of classical literature published before 1900 and 1901-1950 is also reflected 2.83%. Thus it is observed that researchers in LIS use traditional classical literature along with current literature. The maximum use of literature used is 49.32% ranging from 1981 to 2000 (nearly 20 years). This is the golden period of citing literature in the research work. It is also observed that the current publications are cited less due to less awareness to researcher. It is observed that the half life of LIS literature is 80 years and this indicates that information growth

of published articles in this area is normal and hence its half life is more than other discipline in social science where growth of literature is in abundance.

- 8) It is observed that researchers have consulted 41.75% book literature which is second in rank and from this it was noticed that around 89.80% book literature was used which is from three major countries USA, India and UK. Remaining 10.20 % book literature used is published from different countries of the world but counts are very less. It is also observed that few book citations are not indicating the country of publication i.e. place of publication (7.27%). The US and UK literature is no doubt qualitative and hence cited more in the studies by researchers, but Indian literature has also occupied prominent usage (24.36%) since the research has national and local base.
- 9) Prominence of language is English and English is the dominant language (96.74%) and also an important communication language in the field of Library Science. The results observed are also similar with other fields of research. In case of Indian universities, trend of use of information resources published in local languages are also being reported but its usage is very less as the quality literature is not yet available in Indian Languages. In Gujrat sate Gujarati literature is cited and in Maharashtra State, Marathi literature is cited in the theses. It is also observed that in the states of India a research report (Thesis) is permitted to submit in regional language and hence Indian language literature usage is reported in research. However English is an international language used by different races for communicating with each other, besides local language. In order to make the work recognized by others, researchers usually use English as their communication medium. This is an indication to libraries to have a sound collection in English language along with local. Use of citations by the researchers in their research study as per the use of language indicated that three main languages are more popularly used i.e. English, Gujrati and Marathi, Among these three languages, an English language documents (literature) were cited 15781 out of 16313 (96.74%), Gujrati language has 452 (2.77%) and Marathi language documents cited were 41 (0.25%). This indicates that English is the prominent language of information source used by researchers. The local language has less influence but some literature published in Gujrati and Marathi is also very popular and being used in the study by researcher. Thus the language distribution of cited document shows the preference of research students in LIS, for documents published in English followed by local language.

- 10) Based on the cited data collected from the thesis, frequency of journals used by the researcher was ranked. The first 14 ranked journals cited more are listed in which, ASLIB Proceedings stands first and in this list Indian journals like IASLIC Bulletin, Annals of Library Science and Documentations are covered among 14 ranked journals.
- 11) 'Obsolescence' is a term that frequently occurs in the literature of bibliometrics and citation analysis studies. Analysis of citations by age of the cited documents can indicate the 'useful life' or the 'Half life' or the 'Obsolescence rate' of the documents. The half life of literature used for any study in a particular discipline depends on the number of years respectively needed to satisfy one half of all the literature cited on the subject or one half of the citations made to the literature in the current year. (Hadagali et. al , 2009). Half life period of the journal citation for the present analysis has 88 years.
- 12) A total number of 16313 citations were analyzed to ascertain the authorship pattern of cited documents by LIS researchers. Some of the cited documents such as reports, government publications, dictionaries and encyclopedias do not have personal authors but have editors, compilers, associations etc. Therefore these documents are included under the heads editor and corporate body in the analysis. The authorship pattern was categorized into 7 groups: single author, two authors, three authors, more than three authors, editors, corporate bodies and internet resources on URL.
- 13) The majority 11583 (71.00%) of citations in thesis are having single-author works. This is followed by 2428 (14.88%) works authored by two authors, 264 (1.62%) by three authors, and 62 (0.38%) are by more than three authors. The editors comprises 1034 (6.34%), corporate authors or bodies have 117 citations (0.72). The use of internet resources is increasing and in the study 825 (5.06%) information displayed over the net is being used by researchers. The authorship pattern in this study indicates that LIS dissertations favored single authors work. Among the 2428 cited documents 973 are represented by joint authors (Co-Authors). In the ranking of first five Bush and Harter represent first rank with 21 citations. Dr. S R Ranganathan reports rank one for solo authorship.
- 14) Authors from the 3548 cited documents were identified and sorted to calculate frequency count. These are only personal authors, excluding two and more than two authors, editors and corporate authors etc. Joint authors are treated separately. A total



of 3548 authors were identified with 11712 citations based on cumulative counts of author names. The ranking of authors as per citation count is calculated and authors cited minimum 20 times is considered for ranking purpose. The list includes prominent personalities in the field. Dr S R Ranganathan is most cited author (84 times). In the first ten ranks Indian authors are more prominent.

- 15) The cited references were analyzed as per the publishers to find ranking of the publisher and analyze most prominent publishers in the field of LIS. It is observed that from 7406 cited books represented 904 publishers. Out of these first 10 prominent publishers are Academic Press, Marcel Dekker, ALA, Prentice hall, Clive Bingley, McGraw Hill, Oxford, Ess Ess Delhi, Macmillan and Wiley Sons at the leading position having 1472 citations (19.92%)
- 16) A total of 670 journals contribute to the 6874 citations in this research study. Core journals are identified based on rank journals and found that first 25 ranked journals contribute 3351 citations (48.83%). There are 30 journals which count 3665 citations (53.31%) and accounts for 50% coverage of citations. Remaining 636 journals has 3209 (46.68%) citations. Thus the first 25 to 30 journals covers 50% need of the users. These can be considered as core based on ranking of citations. The most cited journal is ASLIB Proceedings with 321 citations, followed by Library Trends with 285 citations, JASIST on fourth rank with 178 citations.
- 17) The graphical presentation of Bradford's Law of Scattering was applied to citations in the present study. For testing the applicability of Bradford's Law of Scattering, a graph was plotted by taking the cumulative number of citations on y-axis and log of cumulative number of journals on x-axis. The curve starts rising exponentially and then linearly indicating that the data fits Bradford's Law. From the graph it is observed that experimental curve is closely associated with theoretical line up to 6700 citations and then start dropping. The citations were grouped in to three zones of 2219, 4381, 6576. Sudhier (2010), had also conducted similar types of studies and satisfied the Bradford's law.
- 18) It is observed that the research conducted so far in LIS covers mainly traditional concepts. The ranking of subjects revealed that academic libraries, reference services, information services, special libraries, ISB, citation analysis are prominent areas in which research studies have been conducted more. It is also observed that few studies covering latest trends in profession like ICT, library networks, internet, digital library etc. are also reflected since 2000 onwards.

- 19) The status of ongoing research points out that the research is covering the latest trends more in the area like open access, software's, library management software's, information literacy, resources sharing, content analysis, IPR, metadata, digital library, information gateway, web technology etc. along with traditional areas
- 20) Researchers in LIS are now using internet based resources along with print. The analysis of used sites indicate that ALA, DLIB, INFOTODAY, DRTC, OCLC, DELNET, NIC, LC, UNESCO, IFLA are the prominent sites used by the researchers while conducting research study.

### **7.3 Suggestions:-**

#### **7.3.1 Suggestion Based on National Research Development:-**

- 1) Many research output in the form of theses are submitted in local language by the researchers and local language of the thesis is the barrier to other researchers to use the document, e.g. in Gujrat universities few theses are submitted in Gujrati language and in Maharashtra in Marathi language. To remove the barrier of language at least summary and abstract of research must be given in English language to facilitate others and have an idea of intellectual product.
- 2) It is observed that data is distributed and reported differently in resources, but there is a need to have a unique source of compilation for authentication of data pertaining to degrees awarded in Indian universities as well as ongoing research. It is also possible to link these database to international sources for exchanging the data. This helps in identifying topics for research and also avoiding duplication in research. No doubt efforts are taken as discussed but still data base in updated.
- 3) It is observed that out of 28 states in India prominent research is carried out in ten states and remaining states have low profile in research. There is a need in increase in research activity in every university. Karnataka and Maharashtra states are at leading positions but research guides are scanty and needs to be added in the roster of guides to attend more research scholars in the LIS field. .
- 4) More than 50% research work was carried out in traditional areas but modern / current technological and managerial areas are less covered and there is a need to increase research in new areas. For this purpose research guides having more expertise in modern librarianship and technologies are to be included in the research guides panel.

- 5) The research conducted so far in Indian National Level is indicating the same trend as in developed country that till 2000 more research was based on traditional but they have initiated research in modern ICT based platform much earlier than developing countries like India, but the research activity in Indian universities has to look in to wider aspects of the currency like ICT and web based concepts.
- 6) Since research activity is increasing in all the universities there is a need felt to add more guides in the panel of every university.
- 7) It is strongly suggested that university libraries and other organizations awarding PhD Degrees in LIS has to develop their own web page and provide the updated data for the research completed and ongoing research in their universities and make the data available to others. This will definitely useful for developing databases, providing links, and also very useful to the researchers and research guides in avoiding duplication efforts.

### **7.3.2 Suggestion based on Western Indian Universities:-**

- 1) It is found that researchers till use print media and use of journals and books more than other types of documents. It is suggested that electronics information resources are increasing fast and researcher have to make use of e-resources like databases, internet resources, and search engines etc for the research study.
- 2) It is noticed that researchers cited the references incomplete in the bibliography and references and hence it creates difficulty for the future researcher to find out the full text document. Researcher must have to take care and provide complete bibliographical details of the references in the research work and in case of internet resources researcher have to provide full URL and intellectual developer etc. (author, title etc.) to facilitate others to rich the source over the internet.
- 3) Research outputs in India in a particular period reported by different authors using different sources indicate different figures and hence reliability of data is in question. This is due to non availability of single source for data of Indian thesis. It is therefore recommended to develop WebPages of universities and provide updated data
- 4) Universities are conducting research programs it is noticed that more Indian journals are subscribed than foreign journals. It is suggested that based on the use study and ranked journals from this study at least the first 14 ranked journals need to be subscribed for conducting the research programme in university libraries. This rank list may be a guiding

principal for universities as well as developing information consortia among LIS departments.

5) From the study it is found that less resources and data bases are visualize and hence it is strongly suggested that university library must subscribe international database for the research activities like LISA, ILISA, EBSCO and EMARLD etc. There is a need to provide maximum access to the information available in the area and also sharing the resources.

6) Current trends in LIS education, technologies and management tools are now more applied in LIS but its research element is not reflected in Indian study e.g. consortia , resource sharing, library networks, information searching, open access, using free information software and tools application in LIS. ICT, IR is such types of research element which are more practical to LIS and need to be considered by the researchers.

7) From the study it was observed that till 2004 more impact of research was based on traditional library activities, but 2004 onwards, Bibliometrics, ICT applications in the library were more concerned areas and recently open access, institutions repositories, webometrics, scientometrics, citations analysis, LIS education curriculum, open sources, digital resource management and preservation, consortia, network based service these are the prominent areas but many are yet still untouched.

8) Few emerging areas in LIS are listed below in which there is still scope to add the research element and also support to solve the issues. Disaster management, accreditation of academic libraries, use of technology for serving different users like lawyers, medical professionals, architecture, industrial libraries, blind, physically impaired etc., consortia, cooperative networks, search engines, ISB in different areas, web based information services, HRD/HRM, changing nature of reference service, skills in profession, collection development policies for different libraries, analyzing core collection in different areas, IPR issues including standards, digital library and digital resource management, data base development and its use for scholarship, IR, digitations of local collection, curriculum for LIS in changing scenario, electronic resources, marketing of libraries and income generation, human resource required in future libraries, internet based services, future libraries and librarianship, library orientation ways and means, reference services in different areas, library services performance, staff performance, library building/ space in future, trends and challenges, digital imaging, digital discovery, social networking. These areas are less touched as far as national and western part is concerned.

8) Qualitative seminar, workshop, conference covering latest trends to be managed regularly and proper funding is to be provided by different organizations like library

associations, UGC, AICTE, state and central government, etc. This may help in generating research attitude among the LIS researchers and also highlight the new areas in conducting research.

- 9) From the point of view of the library and information centers it is essential to evaluate and study the research trends from time to time so that it would be quite easy for designing, organizing and managing the various information services and products to catch the information needs of researchers effectively, expeditiously and exhaustively.
- 8) The research results are very useful for defining different policies based on factual data analysis. The results could be used to develop collection development policy, and other related policies for the organization of libraries.
- 9) The study pointed out that there is a need to conduct periodical orientation programmes for the research scholars to acquaint them with the advanced information tools and available resources in the library which may help in conducting better research.
- 10) In Goa University till date research programs are not conducted and there is a need to create research program activity in LIS and increase the research output from this university.
- 11) Gujrat state has research activity but research output is very low as compared to Maharashtra. There is a need to increase guides in Gujrat state to take care of more research elements from this state.
- 12) The overall analysis of the research carried out in the western Indian Universities, it is observed that topics revealed that the similar research output is reported at national level also selected for research (more than 50% work) relates to traditional functions. But analysis of ongoing research thoroughly touches to current areas but very few studies are being selected in modern practices.
- 13) While considering ongoing research about 136 students are guided 29 research guides. The distribution of guide is not even and hence it is reflected that few guides have more registered students, where as many guides have only 2-3 registrations.

The present research study, support to following aspects in LIS research.

Initially Citation analysis studies help in assessing the status of research and also the status of education at national and regional level. For the LIS departments the study is very helpful in restructuring the library science syllabus and adds currency to it based on the literature published and used as well as trends reported in the reality. The method of implementing syllabus in to practice and dividing it in to theory and practice modules for teaching purpose.

The LIS researcher may get useful literature and also pointer to use the popular literature. Similarly the citation studies may assist in fixing the research topics for new entreats in LIS field and is useful for the both researcher and research guide. The study is also useful for the library administrators in many ways e.g. fixing the collection procurement modes, types of document procurement, fixing policies, Organizing collection, procurement of qualitative publications as well as ranked information resources and also set information services for users. Thus citation study is essential and useful to both academics and Librarians.

There are five potential applications found from this study.

1. Adequate subscription to current periodicals.
2. Use based acquisition.
3. Retention of back runs of periodicals and other resources.
4. Resource allocations to different areas of research.
5. Consortium based procurement
6. Cost effective collection etc.

Focus on the probability of user activity

#### ***7.4 Areas for Further Research:-***

There is a scope for continuation research using citations and similar studies can also be conducted in different areas. It is observed that more research emphasis is on particular areas viz. academic libraries and special libraries in which few areas like user satisfaction, cost effective collection development, KM, IRS, Information search strategy in which research scope is visualized for the followers.

1. Web citation patterns by research scholars of universities in western India.
2. Citation cycle (in a discipline).
3. Webometrics studies of prominent journals available on web.
4. User satisfaction.
5. Consortium based library services
6. Knowledge Management
7. ISR (Information Storage and Retrieval)
8. Change management
9. Changing role of the profession

This chapter is the main part in which findings and suggestions are detailed. The trends in research at national and global level are indicated and also listed the prominent research areas in which research is conducted more as well as emerging trends in LIS profession are also highlighted. The researcher also tried to find out the gaps in research and indicated the need of conducting more research. Part of this chapter fulfilled the objectives “To find prominent research areas and gap in research in LIS” as well as supports the statement of hypothesis “ ICT facilities are hardly explored by researchers”.

### ***7.5 Conclusion:-***

The exponential growth of subject literature, interdisciplinary nature of research and trend towards specialisation has posed many problems both to the information scientists and librarians. Emphasis is on national and international information system has signified the need for analysis of literature used by researchers. Doctoral theses which are the products of research activity have been examined through citation analysis with a view of finding out their effectiveness on the collection development of a library. For this purpose a case study of the doctoral dissertations of universities from western India library since 1981-82 to 2010-11, has been undertaken and the results have been recorded. Similar notable studies are also carried out by Verma and Murthy (1971), chambers and James (1984) and Devarajan and Vijayalakshmy (1982) in other fields. Data on users and use of library resources are necessary for the planning of the library services at all levels. The mechanism of collection of such data in a library not only helps the advancement of research potentialities but also facilitates advancing the knowledge gained into work several and new technologies have been adapted and new tools and techniques are implemented in to the profession to improve the information centres, and libraries to respond to the user’s needs. The revolutionary achievement is the use of computer. The bewildering position is that the user’s approach is found changing constantly and as a result it is difficult to predict or foresee their definite objectives or directions. It is essential therefore, to have an appropriate user study as it constitutes focal point in library and information science education, programme and resource building of a library.

Citation analysis is a practical tool to evaluate users needs and use of information sources by them while conduction any study. Research activates are increasing every years. With citation analysis libraries can evaluate suitability of collection which fulfils the need of users. Citation

studies helps in monitoring budget allocation, collection development, especially useful for journals selection, reserving and weeding.

Research is an important activity for the LIS because research findings are valuable and contribute to knowledge in the field. Since findings are based on practical experience of the researcher helps to solve the problems in the profession. Research helps practitioners to generate new ideas and creates more research projects continuously and also helps in contributing to future development by providing tangible evidences to support design making process and improvement in library services and functions. Hence research activity in LIS is to be increased. Hallam (2005) clearly pointed out that research is critical for creation of professional knowledge as well as development of knowledge, without research it is not possible to adopt new trends. It is also found that during 1997-2002 exploratory research, action research was carried out more frequently. Some research indicates emerging trends and missing links which become areas of greatest potentials to research community for conducting research. The future areas in LIS may depend on electronic information services, staff development, user need assessment, use of ICT, staff skills, networking etc.

There is a potential for improving LIS research using citation studies. The best practices in LIS research can be achieved by sharing the research work with other LIS professionals through publications and online data. This helps in increasing research culture. However it is felt that there is a need to consider use of bibliometric and citation studies to analyse different issues faced by library profession.



## BIBLIOGRAPHY

- Akiko Kubota (1976), A citation analysis of graduation theses of the School of Library and Information Science, Keio University. [In Japanese.] Library and Information Science, Issue: 14, p.193-209 Located at <http://www.mendeley.com/research/citation-analysis-graduation-theses-school-library-information-science-keio-university-japanese/> accessed on 17-12-2011.
- Aksnes, D.W. (2006), Citation rates and perceptions of scientific contribution. Journal of the American Society for Information Science and Technology, 57(2), p.169-185.
- **Angela M. Gooden (2001)** Citation Analysis of Chemistry Doctoral Dissertations: An Ohio State University Case Study, Science and Technology Librarianship. Located at <http://www.library.ucsb.edu/istl/01-fall/refereed.html> accessed on 24-04-2011.
- Anil Kumar H and Dora Mallikarjun (2011), Citation analysis of doctoral dissertations at IIMA: A review of the local use of journals, Library Collections, Acquisitions, and Technical Services, Volume 35, Issue 1, Spring, p.32. , doi:10.1016/j.lcats.2011.03.002 accessed at <http://www.sciencedirect.com/science/article/pii/S1464905511000108> accessed on 23-10-2011.
- Arvinda P and Reddy Pulla V (1990), “Citation analysis of socio cultural anthropology literature.” Lucknow Librarian, Vol. 22, p. 51-57.
- Association of Indian Universities (2010), AIU handbook. New Delhi, AIU.
- Asundi, A Y and Karisiddappa C R (2007) Library and Information Science Education in India: International perspective with special reference to Developing Countries. DESIDOC Bulletin of Information Technology Vol. 27(2) March , p.5-11.
- Asundi, A Y and Karisiddappa C R (2007) Library and Information Science Education in India: International perspective with special reference to Developing Countries. DESIDOC Bulletin of Information Technology Vol. 27(2) March, p.5-11.
- Azadeh F , Vaez R and Gharib M (2009), A Survey of accuracy of cited articles based theses of Medical Specialties Students in Tehran University of

Medical Sciences, Payavard Salamat, Vol. 3(2-1) : p.7 Located at [http://journals.tums.ac.ir/abs.aspx?org\\_id=59&culture\\_var=en&journal\\_id=21&issue\\_id=1937&manuscript\\_id=16717&segment=fa](http://journals.tums.ac.ir/abs.aspx?org_id=59&culture_var=en&journal_id=21&issue_id=1937&manuscript_id=16717&segment=fa) accessed on 03-05-2011.

- Barahona, Jesus M Gonzalez (2007), on the importance of publishing research results, libresoft seminar, Mostoles, March 13<sup>th</sup> 2007. Accessed at <http://libresoft.es> accessed on 15.03.2012
- Barman Badan (2012), Library and information science education, Accessed at <http://www.netugc.com/library-and-information-science-education-in-india> dated on 14.04.2012
- Beena S (1996), “Book publishing in Malayalam: A bibliometric approach.” *Library science with a slant to documentation*, Vol. 33, p.191-199.
- Bellis, De Nicola (2009). *Bibliometrics and citation analysis: from the Science citation index to Cybermetrics*. Scarecrow Press. P.417. ISBN 0-8108-6713-3. Located at [http://books.google.com/books/about/Bibliometrics\\_and\\_citation\\_analysis.htm?hl=id=ma4YjaKyM9cC](http://books.google.com/books/about/Bibliometrics_and_citation_analysis.htm?hl=id=ma4YjaKyM9cC) accessed on 23.08.2011.
- Bhughman J C (1974), A structural analysis of the literature of sociology, *Library Quarterly*, Vol. 44 (Oct), p.293-308.
- Biglu, Mohammad Hussein, (2005), The Impact Factor and self citation trend of German journals indexed in the JCR, Located at <http://eprints.rctic.org/bitstream/10760/10231/1/factor-german.pdf>. Accessed on 15-07-2011.
- Bill Johnson (1996), Citation Analysis of the Texas Tech University's Statistics Faculty: A Study Applied to Collection Development at the University Library, *LIBRES: Library and Information Science Research Electronic Journal* ISSN 1058-6768 Volume 6 Issue 3; September Quarterly LIBRE6N3, Accessed at <http://libres.curtin.edu.ac/libre6n3/johnson.htm> accessed on 12-10-2011.
- Bill Johnson (2000), Environmental Impact: A Preliminary Citation Analysis of Local Faculty in a New Academic Program in Environmental and Human Health Applied to Collection Development in an Academic Library (LIBRES.) *Library Philosophy and Practice* Vol. 2, No. 2 (Spring) Located at <http://www.uidaho.edu/~mbolin/lppv2n2.htm> and

<http://www.curtin.edu.au/curtin/dept/sils/libres/libre9n1/toxcite.htm>  
accessed on 24-12-2011.

- Birger Hjørland and Jeppe Nicolaisen “Bradford’s Law of Scattering: Ambiguities in the Concept of "Subject" Royal School of Library and Information Science, Birketinget 6, DK-2300 Copenhagen S., Denmark {bh, jni}@db.dk
- Boell, S.K. (2007), A Scientometrics Method to Analyze Scientific Journals as Exemplified by the Area of Information Science, (Unpublished Thesis]. E-LIS. E-prints in Library and Information Science Accessed at [http://eprints.rclis.org/bitstream/10760/3949/1/Boell,\\_Sebastian\\_K-2007-Master\\_Thesis-body.pdf](http://eprints.rclis.org/bitstream/10760/3949/1/Boell,_Sebastian_K-2007-Master_Thesis-body.pdf) accessed on 03-09-2010.
- Bradford, S.C. Sources of information on specific subjects. Engineering, 1934, 137 (3550), p.85-86.
- Brennen, Patrick W (1978), Citation Analysis in the Literature of Tropical Medicine, Bull. Med. Lihr. Assoc. 66 (1) January, Located at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC225294/pdf/mlab00085-0048.pdf> accessed on 24-09-2010.
- British Standards Institution. British standards of documentation terms. BSI; London; 1976, p.7.
- Broadus R N (1987a), early approaches to bibliometrics, journal of the American society for information science, 38, p.127-129.
- Casserly Marry F and Bird James E (2003), Web citation availability: Analysis and implications for the scholarship, College and research libraries, Vol. 64(4)
- Chandrasekharan, M and Ramasesh, C.P (2009).Library and Information Science Research in India. Asia Pacific Conference, on Library and Information Education and practice. Located at <http://www.slis.tsukuba.ac.jp/~atsushi/a-liep/proceedings/Papers/a65.pdf> accessed on 27-5-11.
- Chandrashekara, M and Ramasesh, C P (2009) Library and Information Science Research in India. Asia Pacific Conference on LIS education and practice, p.530-537.
- Chang-Ping Hu , Ji-Ming Hu , Yan Gao and Yao-Kun Zhangjournal (2011) , J A journal co-citation analysis of library and information science in China,

Scientometrics 86, p.657, accessed at <http://portal.acm.org/citation.cfm?id=1938394> accessed on 27-04-2011.

- Chaurasia Kamal Kumar (2008), Bibliometric Analysis Of Annals Of Library And Information Studies (2002-2006), MANLIBNET 9th Annual National Convention, New Delhi (India), 4-6 February E-LIS. E-prints in Library and Information Science Located at <http://eprints.rclis.org/handle/10760/11756> accessed on 27-08-2011.
- Chen Ching-Chih (1977), A Citation Analysis of the Bulletin of the Medical Library Association, Bull. Med. Libr. Assoc. 65(2)April, p.290, Located at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC199339/pdf/mlab00130-0123.pdf> accessed on 13.12.2011.
- Chia Lo Szu (2007), Use of Information Resources in Writing up Dissertation: A Citation Analysis, International Conference on Engineering Education – ICEE, September 3 – 7, Coimbra, Portugal. Accessed at <http://www.ineer.org/Events/ICEE2007/papers/257.pdf> and <http://www.mendeley.com/research/cocitation-analysis-research-method-library-information-science/> accessed on 15.05.2011.
- Chikate R V and Dr. Patil S K (2008) Citation Analysis of Theses in Library and Information Science Submitted to University of Pune: A Pilot Study, Library Philosophy and Practice 2008 accessed at <http://webpages.uidaho.edu/~mbolin/chikate-patil> accessed on 22.09.2011.
- Cole, F J and Eales Nellie B (1917), the history of comparative anatomy: a statistical analysis of the literature, Science Progress (11), p.578-596.
- Consuella A. Askew (2008), an examination of Lotka's law in the field of library and information studies, Florida International University, Miami, Florida (Ph. D Thesis). Located at <http://digitalcommons.fiu.edu/cgi/viewcontent.cgi?article=1235&context=etd&sei-redir=1#search=%22An%20Examination%20Lotka%20C3%A2%20C2%80%2099s%20law%20Field%20Library%20Information%20Studies%22> accessed on 09.12.2011.
- Dalia Cohen (1987), "A bibliometric method for the evolution and design of research funding policies". Dissertation Abstracts, DAI 47/08, p.264A. (Case Western Reserve University)

- Das Anup Kumar and Sen B K (2001), Journal Of Biosciences – An Analysis Of Citation Pattern Annals of Library and Information Studies 48, 2; p. 59
- Datta Bidyarthi and Sen B K (2000), Indian journal of pure and applied physics- An analysis of citation pattern, ILA Bulletin, Vol. 44(12)
- Datta, B and Kumar, Anup and Sen B. K (2001), Variations in journal self citation: A pattern, ILA Bulletin, Vol. 37 (1).
- De Groote Sandra (2008), Citation patterns of online and print journals in the digital age, J Medical Library Association. October; 96(4): p.362. Located at [http://www.experts.scival.com/uic/pubDetail.asp?t=pm&id=18974814&o\\_id=167](http://www.experts.scival.com/uic/pubDetail.asp?t=pm&id=18974814&o_id=167) accessed on 16.12.2011.
- Denick, D (2010), Citation Analysis of Engineering Design Reports for Information Literacy Assessment Located at [http://idea.library.drexel.edu/bitstream/1860/3475/1/Denick\\_Bhatt\\_Layton.pdf](http://idea.library.drexel.edu/bitstream/1860/3475/1/Denick_Bhatt_Layton.pdf) accessed on 14.10.2011.
- Dervos Dimitris A., Samaras Nikolaos, Evangelidis Georgios and Folias Theodore (2006), A New Framework for the Citation Indexing Paradigm, In 69th Annual Meeting of the American Society for Information Science and Technology (ASIST), Austin (US), 3-8 November .Richard B. Hill. (Published) [Conference Paper] E-LIS. E-prints in Library and Information Science. Located at <http://eprints.rclis.org/handle/10760/8787> accessed on 14.02.2012.
- Deshpande Meera and Rajyalakshmi D (1997), Citation study of dissertations in Library and Information science, Annals of Library Science and Documentation, Vol. 44(12)
- Diluvio C Y (1990), “Science in the Philippines: A bibliographic and bibliometric analysis of the periodical literature.” Dissertation abstracts, DAI 50/07, p.166 A (University of Illinois at Urbana-Champaign).
- Duzyol Guleda, Taskin Zehra and Tonta Yasar (2010), Mapping the Intellectual Structure of the Open Access Field Through Co-citation Analysis, Located at E-LIS. E-prints in Library and Information Science, and <http://eprints.rclis.org/handle/10760/14910> accessed on 17.12.2011.
- Earl Babbie (2010), the practice of social research, 10<sup>th</sup> edition, Wadsworth, Thomson Learning Inc., ISBN 0-534-62029-9.

- Eckel Edward J. (2009), *The Emerging Engineering Scholar: A Citation Analysis of Theses and Dissertations at Western Michigan University*, Science and Technology Librarianship, winter, Located at <http://www.istl.org/09-winter/refereed.html> accessed on 17.12.2011.
- Egghe L (2000), Lectures Potter, W G (1981) *Introduction to Bibliometrics*. Library Trends Vol 30, p.5.
- Egghe L (2000). A heuristic study of the first-citation distribution. *Scientometrics* 48(3), p.345-359.
- Fairthorne, R. A. (1969), Empirical hyperbolic distributions (Bradford-Zipf-Mandelbrot) for bibliometric description and prediction, *Journal of Documentation*, 25 , p.319–343.
- Fairthorne R A (1969), Empirical hyperbolic distributions for bibliometric description and prediction, *Journal of Documentation*, 25, p.319.
- Fang, M L (1989), Journal rankings by citation analysis in health sciences librarianship. *Bull Medical Library Association*. April; 77(2), p.205–211. Accessed at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC227369/> accessed on 17.12.2011
- Farooq Joubish and Ashraf Khurram (2011), outlook on some concepts in the curriculum of social studies, *World Applied Science Journal* 12(9), p.1374-1377. ISSN 1818-4952.
- Fuchs Beth E, Cristina M. Thomsen, Randolph G. Bias, and Donald G. Davis Jr.(2006), *Behavioral Citation Analysis: Toward Collection Enhancement for Users* , College & Research Libraries, July vol. 67 no. 4, p.304-324 Located at <http://crl.acrl.org/content/67/4/304.abstract> accessed on 17.12.2011
- Garfield, E (1974), *Citation Indexing: Its theory and application in science, Technology and Humanities*, New York, Wiley,
- Garfield, E. (1983). *Citation Indexing - Its Theory and Application in Science, Technology and Humanities*. Philadelphia: ISI Press. Retrieved November 4, 2011 from Located at <http://garfield.library.upenn.edu/ci/contents.pdf>. accessed on 12.04.2011.
- Garfield, E., Citation analysis as a tool in journal evaluation. *Science*, Vol. **178**, p.471–479.

- Garg Ram Gopal, Tamrakar Rajnish and Tamrakar Amit (2009), Doctoral Research on Academic Libraries and Allied Fields in Indian Universities : A Bibliometric Study, Proceeding of International Conference on Academic Libraries October 2009, at University of Delhi, New Delhi, p.193. Accessed at [http://crl.du.ac.in/ical09/papers/index\\_files/ical-32\\_134\\_295\\_1\\_RV.pdf](http://crl.du.ac.in/ical09/papers/index_files/ical-32_134_295_1_RV.pdf) accessed on 17.12.2011.
- Ghosh Saptarshi (2000), Citation pattern of contributions in library science with a slant to documentation and information studies, SRELS Journal of Information Management, Vol. 37(4)
- Gooden, A.M. (2001). Citation analysis of chemistry doctoral dissertations: An Ohio State University case study. Retrieved October 13, 2008 from Located at <http://www.istl.org/01-fall/refereed.html> accessed on 27.12.2011.
- Google scholar blog (2011), Google scholar citations open to all, Google. Located at <http://en.wikipedia.org/wiki/I10-index> accessed on 03.09.2011.
- Griscom Richard (1983), Periodical Use in a University Music Library: A Citation Study of Theses and Dissertations Submitted to the Indiana University School of Music from 1975-1980, The Serials Librarian, Vol. 7(3), Spring. Located at [http://repository.upenn.edu/cgi/viewcontent.cgi?article=1068&context=library\\_papers&seiredir=1#search=%22Periodical%20Use%20University%20Music%20Library%3A%20Citation%20Study%20Theses%20Dissertations%20Submitted%20Indiana%20University%20School%20Music%20from%201975-1980%22](http://repository.upenn.edu/cgi/viewcontent.cgi?article=1068&context=library_papers&seiredir=1#search=%22Periodical%20Use%20University%20Music%20Library%3A%20Citation%20Study%20Theses%20Dissertations%20Submitted%20Indiana%20University%20School%20Music%20from%201975-1980%22) accessed on 23.03.2011.
- Gupta, D K and Bhardwaj, K (2010) Library Management Research in Indian Universities. Annals of Library and Information Studies. Vol. 57(Dec), p.333-338.
- Hadagali Gururaj S, Kumbar B D and Benahal Amrut (2009), Citation Analysis of Ph D Thesis submitted to Karnataka University, Dharwad in the field of Physics, Information Studies, Vol. 15, Issue 2. Located at <http://www.indianjournals.com/ijor.aspx?target=ijor:is&volume=15&issue=2&article=005> accessed on 25.05.2011.
- Haddow Gaby and Genoni Paul (2010) Citation analysis and peer ranking of Australian social science journals , Scientometrics Volume 85 Issue 2, November. Located at

<http://www.springerlink.com/content/32753r57x48023p6/> accessed on 30.05.2011.

- Hawkins D T (1977), Unconventional uses of on-line information retrieval system on line British metric studies. *Journal of American society for information science*, 28(1), p.13-18.
- Henderson, M., Shurville, S. and Fernstrom, K. (2009). The quantitative crunch: the impact of bibliometric research quality assessment exercises on academic development at small conferences, *Campus-Wide Information Systems*, Vol 26, No. 3, p.149–167.
- Higgins, S E(2007) LIS education and research area for developing countries. 5th International CALIBER. Punjab University Chandigarh. 8-10 Feb 2007
- Higher Education Funding Council for England, Located at <http://www.hefce.ac.uk/Research/ref/>. and <http://www.ref.ac.uk/> accessed on 12<sup>th</sup> May 2012.
- Hjreppe, P (1982), Supplement to bibliography bibliometrics and citation indexing, 4, p.241-273.
- Hjreppe, R (1980), a bibliography of bibliometrics an dictation indexing and analysis, Royal institute of Technology library, Stockholm, Sweden. Located at <http://www.gslis.utexas.edu/~palmquis/courses/biblio.html#Laws> and <http://www.netugc.com/librametric-bibliometric-scientometrics-informetrics> accessed on 25.08.2012.
- [http://en.cnki.com.cn/Article\\_en/CJFDTOTAL-ZNTB200920074.htm](http://en.cnki.com.cn/Article_en/CJFDTOTAL-ZNTB200920074.htm)
- Hulme, E.W. (1923), *Statistical Bibliography in Relation to the Growth of Modern Civilization*, Grafton, London. p9.
- Ijary S R and Kannappanavar (1990), “Information usage patterns of Indian clinical psychologist: A citation study.” *Journal of library and information science*, Vol. 16, p.170-183.
- Jadhav Vandana S, Khaparde Vaishali S and Shelke Santosh M (2011), *Citation Analysis Of University News Journal*, 8th International CALIBER - 2011, Goa University, Goa, March 02-04, © INFLIBNET Centre, Ahmadabad accessed at <http://shodhganga.inflibnet.ac.in/dxml/handle/1944/1655> accessed on 17.12.2011



- Jan Rosy (2009), Citation Analysis of Library Trends , Webology, Volume 6, Number 1, March, Located at <http://www.webology.org/2009/v6n1/a67.html> accessed on 27.09.2011.
- Janakiramaiah M and Doraswamy M (2011), Measuring Impact Of Web Resources In Conference Proceedings: A Citation Analysis, 8th International CALIBER - 2011, Goa University, Goa, March 02-04, INFLIBNET Centre, Ahmadabad. Located at <http://shodhganga.inflibnet.ac.in/dxml/handle/1944/1645> accessed on 03.12.2011.
- Javed Muhammad and Shah Syed Shoaib (2008), Rawal Medical Journal – An Analysis of Citation Pattern, The Journal of the Pakistan Medical Association, Vol. 33, Number 2, July- Dec. *Rawalpindi - Islamabad* . Located at [http://www.rmj.org.pk/ram\\_july\\_dec\\_08/sounding\\_board/full\\_article.html](http://www.rmj.org.pk/ram_july_dec_08/sounding_board/full_article.html) accessed on 03.12.2011
- Jonathan Nabe and Andrea Imre (2008), Dissertation Citations in Organismal Biology at Southern Illinois University at Carbondale: Implications for Collection Development, Science and Technology Librarianship, Fall. <http://www.istl.org/08-fall/refereed.html>
- Kabir S Humayoon (1994), “Authorship trend and solo research in bibliometrics: A bibliometric study.” Library science with a slant to documentation, Vol. 31, p.87-90.
- Kannappanavar B U and Vijay Kumar M (2000), Fifty years of LIS research in India: Trends and developments, SERLS journal of information management, Vol. 37 (4), p. 267-300.
- Kannappanavar B U, Savadatti S G and Nulvi C N (1991), “Obsolescence of literature in clinical psychology” Lucknow Librarian , Vol. 23, p. 84-94.
- Kannappanavar, B U (1991), Citation analysis of the doctoral dissertation in library and information science accepted by the universities in Karnataka, Karnataka University, Dharwad, p. 88. (Ph. D Thesis)
- Karisiddappa C R, Maheshwarappa B S and Shirol M V (1990), “Authorship pattern and collaborative research in Psychology.” IASLIC Bulletin, Vol. 35, p. 73-78.

- Kayongo Jessica (2011), Relevance of Library Collections for Graduate Student Research: A Citation Analysis Study of Doctoral Dissertations at Notre Dame, College and Research Libraries Pre-Print, Located at <http://crl.acrl.org/content/early/2011/03/28/crl-211.full.pdf> Accessed on 14.08.2011
- Keat Yeap Chun and Kiran Kaur (2008), Citation Study Of Library And Information Science Dissertations For Collection Development, Malaysian Journal of Library & Information Science, Vol.13, no.2, Dec, p.29-47. Accessed at <http://majlis.fsktm.um.edu.my/document.aspx?FileName=658.pdf> Accessed on 14.08.2011.
- Kousha, Kayvan and Thelwall, Mike (2007), Google Scholar Citations and Google Web/URL Citations: A Multi-Discipline Exploratory Analysis, Journal of the American Society for Information Science and Technology, Volume: 58, Issue: 7, Publisher: John Wiley & Sons, Inc., p.1055-1065. Accessed at <http://www.mendeley.com/research/google-scholar-citations-and-google-weburl-citations-a-multidiscipline-exploratory-analysis/> Accessed on 23.12.2011
- Kubota Akiko (1976), A citation analysis of graduation theses of the School of Library and Information Science, Keio University. [In Japanese.] Library and Information Science (1976) **vol.14**, p.193-209. Located at <http://www.mendeley.com/research/citation-analysis-graduation-theses-school-library-information-science-keio-university-japanese/> Accessed on 23.12.2011
- Kumar P S G (1998), Doctoral Studies in Library and Information Science in India: A Study, DESIDOC Bulletin of Information Technology, Vol 18, No. 1, January 1998, p.5-9. Located at <http://publications.drdo.gov.in/gsdli/collect/dbit/index/assoc/HASH719f.dir/dbit1801005.pdf> Accessed on 23.12.2011
- Kumar Surendra and Kumar S (2011), Citation Analysis of Journal of Oilseed Research, 8th International CALIBER - 2011, Goa University, Goa, March 02-04, Located at <http://shodhganga.inflibnet.ac.in/dxml/bitstream/handle/1944/1643/51.pdf?sequence=1> Accessed on 05.06.2011

- LaBonte Kristen B. (2005), Citation Analysis: A Method for Collection Development for a Rapidly Developing Field, *Science and Technology Librarianship Summer*, Accessed at <http://www.istl.org/05-summer/refereed.html> Accessed on 05.06.2011.
- Michael Halperin,(1976), Citation Patterns in Library Science Dissertations, *Journal of Education for Librarianship*, 16, 4, p.271-283, Spring. Located at [http://www.eric.ed.gov/ERICWebPortal/search/detailmini.jsp?\\_nfpb=true&\\_&ERICExtSearch\\_SearchValue\\_0=EJ143292&ERICExtSearch\\_SearchType\\_0=no&accno=EJ143292](http://www.eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=EJ143292&ERICExtSearch_SearchType_0=no&accno=EJ143292) accessed on 29.12.2011.
- Lal Arjun (1993), “Most important journals from the point of view of Indian soil scientists: A bibliometric study.” *IASLIC Bulletin*, Vol. 38, p. 123-131.
- Lal, A., & Panda, S (1996). Research in plant pathology: A bibliometric analysis. *Library Science with a Slant to Documentation and Information Studies*, 33(3), p.135-147.
- Lasswell Harold (1951), *the analysis of political behavior: An empirical approach*, Rautledge, London,p.525.
- Lotka A J (1926), the frequency distribution of scientific productivity, *Journal of the Washington Academy of Sciences*, Vol. 16 (12), p.317-323.
- Mahapatra Gayatri (1992), “Post Ranganathan Era: A bibliometric analysis of Ranganathan’s contributions.” *IASLIC Bulletin*, Vol. 37, p. 177-182.
- Mahapatra Gayatri (1995), “bibliometric analysis of the highly cited Indian library and information science journals.” *Herald of library science*, Vol. 34, p. 27-34.
- Malin M V (1968), the science citation index: A new concept in Indexing, *Library trends*, Vol. 16, p. 376.
- Martens Betsy Van der Veer (2001), Do citation systems represent theories of truth?, *Information Research*, Vol.6, No. 2, January , Located at <http://informationr.net/ir/6-2/paper92.html> Accessed on 05.06.2011
- Martin, M U (1968), Science citation index: A new concept in indexing, *Library Trends*, Vol. 16, p.376.
- Martyn L A (1976), Use studies in library planning, *Library Trends* 24(30).
- Meadows A J (2004), The citation characteristics of astronomical research literature, *Journal of Documentation*, Vol. 60(6).

- Meho Lokman I and Yang Kidul (2006), A New Era in Citation and Bibliometric Analyses: Web of Science, Scopus, and Google Scholar, Journal of the American Society for Information Science and Technology, Volume: in press, p.49. Located at <http://arxiv.org/ftp/cs/papers/0612/0612132.pdf> and <http://www.mendeley.com/research/a-new-era-in-citation-and-bibliometric-analyses-web-of-science-scopus-and-google-scholar> accessed on 28.06.2011.
- Meho, Lokman I and Rogers Yvonne (2008), Citation Counting, Citation Ranking, and *h*-Index of Human-Computer Interaction Researchers: A Comparison between Scopus and Web of Science, Journal of the American Society for Information Science and Technology, 59(11), p.1711-1726. Accessed at <http://sci2s.ugr.es/hindex/pdf/MehoRogers2008.pdf> accessed on 24.02.2012.
- Meho, Lokman I. and Sonnenwald, Diane H. (2000), Citation Ranking Versus Peer Evaluation of Senior Faculty Research Performance: A Case Study of Kurdish Scholarship, Journal of the American Society for Information Science. 51(2), p.123. Accessed at <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.85.8879> accessed on 12-1-2011)
- Miller Laura Newton( 2011),University Biology Patrons in the Library Literature 2000-2010: A Content Analysis & Literature Review, the Canadian Journal of Library and Information Practice and Research, Vol 6, No (1). Accessed at <http://journal.lib.uoguelph.ca/index.php/perj/article/viewArticle/1400/2055> accessed on 10.02.2012.
- Miller, Laura Newton (2011), Local Citation Analysis of Graduate Biology Theses: Collection Development Implications , Science and Technology Librarianship, Winter, Located at <http://www.istl.org/11-winter/refereed3.html> accessed on 30.12.2011.
- Moradi Shima, Asnafi Amir Reza and Ahwaz-Iran (2006), A glance to Iranian Librarianship blogs: a survey using webometrics method Located at [http://eprints.rclis.org/bitstream/10760/8290/1/A\\_glance\\_to\\_Iranian\\_Librarianship\\_blogs.pdf](http://eprints.rclis.org/bitstream/10760/8290/1/A_glance_to_Iranian_Librarianship_blogs.pdf) Accessed on 05.06.2011

- Mulla, K. R. (2011), Mapping of the International Journal of Information Science and Management (2003-2009): A Citation Study, International Journal of Information Science and Management, Vol. 9, No. 1 January / June, p.1. Located at [http://www.srlst.com/ijist/Vol9N1/ijism-V9N1\\_files/ijism91-1-17.pdf](http://www.srlst.com/ijist/Vol9N1/ijism-V9N1_files/ijism91-1-17.pdf) accessed on 23.01.2012.
- Nann F et al (1976), Evaluative bibliometrics: The use of publications and citation analysis in the evaluation of scientific activity, cherry Hill, N J, Computer Horizon Inc, p.334-337.
- Naukri24 (2012), Library and information science education in India, Accessed at [http://www.news24online.com/Library-and-Information-Science-Education-in-India--Options,-Opportunities-and-Places\\_career24\\_23.aspx](http://www.news24online.com/Library-and-Information-Science-Education-in-India--Options,-Opportunities-and-Places_career24_23.aspx) accessed on 14.04.2012
- Neshaneh Pakdaman (2009), Citation Analysis of Research in Science & Petroleum Engineering Quarterly (1380-86), Epistemology (Librarianship and Information Science and Information Technology), January, p.28. Located at <http://iau-tnb.iau.ofis.ir/default.aspx?articles&member=2744&page=1> accessed on 12.10.2011.
- Neuendorf, Kimberly A. (2002), The Content Analysis Guidebook Thousand Oaks, CA: Sage Publications.
- Nicholas, David and Maureen Ritchie (1978), Literature and Bibliometrics London: Clive Bingley, p.28-29.
- Nishavathi (2007) Research trends in library and information science: A subjective analysis of doctoral thesis published in India, NACLIN, Nov. 20-23, p.559-568. Accessed at [www.naclin.org/E%20Nishavati.ppt](http://www.naclin.org/E%20Nishavati.ppt). accessed on 24.12.2011.
- Noguchi S (1988), Japanese style management: a bibliometric study, Special Libraries. 79, p.314-321.
- Nuria Vallmitjana and Sabate L G (2008), Citation Analysis of Ph.D. Dissertation References as a Tool for Collection Management in an Academic Chemistry Library, Located at <http://www.crl.acrl.org/content/69/1/72.full.pdf> accessed on 21.09.2011.
- Nweke K M C (1989), "Bradford's law and the journal titles cited by research scholars in zoology at the Ibadan University, Nigeria." IASLIC Bulletin, Vol. 34, p. 97-104.

- O'Connor M A (1979), Florida state University dissemination and use of library science dissertation in the periodicals indexed in the Social science citation index, Dissertation abstracts. 39, p.6381.
- Ole R. Holsti (1969), Content Analysis for the Social Sciences and Humanities. Reading, MA: Addison-Wesley.
- Pali U. Kuruppu and Moore Debra C (2008), Information Use by PhD Students in Agriculture and Biology: A Dissertation Citation Analysis , Libraries and the Academy - Volume 8, Number 4, October, p.387. Located at [http://muse.jhu.edu/login?uri=/journals/portal\\_libraries\\_and\\_the\\_academy/v008/8.4.kuruppu.pdf](http://muse.jhu.edu/login?uri=/journals/portal_libraries_and_the_academy/v008/8.4.kuruppu.pdf) accessed on 27.12.2011.
- Philipp Mayr and Walther Umstatter (2007), Why is a new Journal of Infometrics needed?, Cybermetrics. Accessed at <http://eprints.rclis.org/handle/10760/8847> accessed on 27.02.2012.
- Pillai Sudhier, K G (2009), Application of Bradford's Law of Scattering to the Physics Literature: A Study of Doctoral Theses Citations at the Indian Institute of Science , DESIDOC Journal of Library & Information Technology, Vol. 30, No. 2, March 2010, p.3-14. © 2010, DESIDOC Received on 12 October, Located at <http://publications.drdo.gov.in/gsdl/collect/dbit/index/assoc/HASH8a2b.dir/dbit3002003.pdf> accessed on 17.05.2012.
- Pillai Sudhier, K G And Kumar V K (2010), Scientometrics Study of Doctoral Dissertations in Biochemistry in the University of Kerala, India, *Library Philosophy and Practice*, Located at <http://www.webpages.uidaho.edu/~mbolin/sudhier-dileepkumar.htm> accessed on 16.04.2011.
- Podlubny Igor (2004), A note on comparison of scientific impact expressed by number of citations in different fields of science, *Scientometrics*, Vol.64, no.1, July, 95-99p. Journal ISSN: 0138-9130 (Paper) p.1588-2861 (Online) accessed at <http://arxiv.org/abs/math/0410574> accessed on 02.09.2011.
- Potter W G (1981), Introduction to bibliometrics, *Library Trends*, Vol. 30, p.5.
- Price, De Solla (1970). Citation measures of hard science, soft science, technology, and non science. In C. E. Nelson and D. K. Pollock (Eds.),

Communication among scientists and engineers, Lexington, MA: Heath Lexington Books , p.3-22.

- Pritchard A (1969), statistical bibliography; an interim bibliography, North-western polytechnic, school of Librarianship, London, p.60.
- Pritchard Alan (1969), Statistical bibliography or bibliometric, Journal of Documentation, Val. 25, p.348-349.
- Pritchard, A and Witting, G R (1960), Bibliometrics: A bibliography and index (1874-1959), Aaih Books, Westford,
- Pulla Reddy V. and Sharma S S R (1988), “bibliometric study of research publication in Indian environmental Genetic toxicology” IASLIC Bulletin, Vol. 33(1), p. 7-14.
- Raising L (1962), Statistical bibliography in the health sciences, Bulletin the medical library Association, 50, p.450-461.
- Raman, Sarala and Varghese, M (2011), Use of Information Sources by the Soil Scientists in Kerala: A Case Study of the Citations in the Master’s Degree Theses of the Kerala Agricultural University, 8th International CALIBER - 2011, Goa University, Goa, March 02-04, Located at <http://ir.inflibnet.ac.in/dxml/handle/1944/1649> accessed on 22.08.2011.
- Ramesh, L.S.R.C.V., & Nagaraju, A.V.S.S. (2000), Citation Analysis of the Indian Journal of Information, Library and Society, Indian Journal of Information, Library and Society. VI3, N3 -4, July- December, p.171. Located at E-LIS. E-prints in Library and Information Science , and <http://eprints.rclis.org/handle/10760/5913?mode=full> accessed on 23.09.2011.
- Rana R (2011), Research trends in library and information science in India with a focus on Punjab University Chandigarh, International Information and Library review Vol. 43, p.23-42.
- Ranganathan S R (1969), Librametry and its scope. DRTC Annual seminar (7) paper DA Bangalore: DRTC, ISI and sarada Ranganathan Endowment of Library Science. Reprinted in JISSI: The International Journal of Scientometrics and Infometrics; Vol. 1, No. 1, (1995), p.15-21. (ISSN-0971-6696)

- Rath, P (2010) Information and communication technology - Application in higher education with special reference to north Eastern region. Located at [www.caluniv.ac.in/news/prabhakar.doc](http://www.caluniv.ac.in/news/prabhakar.doc) accessed on 23.07.2011.
- Reed K L (1995), Citation analysis of faculty publication: beyond Science Citation Index and Social Science Citation Index, Bull Med Library Association. October; 83(4), p.503–508. Located at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC226074/> accessed on 12.05.2012.
- Rekha, G and Parameswaran, M (2002), Knowledge organization 1988-1999: A bibliometric analysis, SRELS Journal of Information management, Vol. 39(4).
- Rubin, Richard (2010). Foundations of library and information science (3rd ed.). New York: Neal-Schuman Publishers. ISBN 978-1-55570-690-6. Assessed at <http://books.google.com/books?id=Pk1TSAAACAAJ> accessed on 09.02.2012.
- Ruimin Ma, Qiangbin Dai, Chaoqun Ni and Xuelu Li (2009), An author co-citation analysis of information science in China with Chinese Google Scholar search engine, 2004–2006, Scientometrics, Vol. 81, No. 1, p.33, DOI: 10.1007/s11192-009-2063-x Accessed at <http://www.springerlink.com/content/f2wg100412467351/> accessed on 30.10.2011.
- Sahu, A K. , Goswami, N.G. and Choudhary, B.K. (2011), Research publications of National Metallurgical Laboratory during the year 2001- 2010 - A study on citation patterns, Annals of Library and Information Studies (ALIS) , Vol 58(2), June, p. 151. Located at <http://nopr.niscair.res.in/handle/123456789/12186> accessed on 03.08.2012.
- Saxena S C , Relan Sonia and Murthy S S (1999), Software for ranking Indian scientists based on citations to their publications, DESIDOC bulletin of information technology, Vol. 19 (6)
- Schneirder J W and Borland Pia (2004), Introduction to bibliometrics for construction and maintenance of thesauri Methodological consideration, Journal of Documentation, Vol. 60(5)



- Scholman Barbara Frick (1990), “Health education as a specialized field of study: A bibliometric analysis of its research literature.” Dissertation Abstracts, DAI 28/03, P. 71. (Kent state University)
- Schrader, Alvin M. (1981), teaching Bibliometrics, *Library Trends* 30, p.151-172.
- Sellen M K (1984), Bibliometrics in information science. A citation analysis of two academic library journals, *College Research Libraries*, Volume: 45, Issue: 2, p.129. Located at <http://www.mendeley.com/research/bibliometrics-information-science-citation-analysis-two-academic-library-journals/> accessed on 24.05.2011.
- Sen S K and Chatterjee S K (1990), “An introduction to research in Bibliometrics: Part I; Background and perspective”, *IASLIC Bulletin*, Vol. 35 (3), p. 105-118.
- Sengupta (1988), *Bibliometric research: Growth of biomedical literature*, Vol. 1, Calcutta: SBA pub. , p.46.
- Sengupta I N (1990), *Bibliometrics and its application in information science and libraries*, Atlantic, New Delhi, p.256.
- Sharada B A and Devaki L (1990), “Contribution of journal articles by Indian linguists at the international scene.” *Annals of Library science and Documentation*, Vol. 37(1), p.35-52.
- Shi-Jian Gao and Wang-Zhi Yu and Feng-Ping Luo (2009), Citation analysis of PhD thesis at Wuhan University, China, *Library Collection, Acquisitions and Technical Services* Volume 33, Issue 1, Spring 2009, p.8-16 Located at <http://www.sciencedirect.com/science/article/pii/S1464905509000281> accessed on 17.12.2011.
- Soehner C B, Wray S T, and Richards D T (1992), The landmark citation method: analysis of a citation pattern as a collection assessment method, *Bull Med Libr Assoc.* October; 80(4), p.361–366. Accessed at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC225700/pdf/mlab00117-0051.pdf> accessed on 24.09.2011.
- Suryanarayana Y V (2000), Bibliometric analysis of contributions of journal tobacco research, *Annals of Library Science and Documentation*, Vol. 47(3).

- Swanepoel Adriaan (2010), Ph.D., Library and Information Services, Tshwane University of Technology; research fields: library and information science, citation analysis, US-China Education Review, October, Vol. 7, No. 10, Serial No. 71. Located at [www.teacher.org.cn/doc/ucedu201010/ucedu20101012.pdf](http://www.teacher.org.cn/doc/ucedu201010/ucedu20101012.pdf) accessed on 09.12.2011.
- Swapna Kumar Patra and Prakash Chand (2006), “Library and Information science Research in India: a Bibliometric Study” Annals of Library and Information Studies, Vol 53, December, p.219-223.
- Taylor Hazel and Dillon Stuart (2008), The Changing Face of Information Systems Research: A Longitudinal Study of Author Influence , Informing Science: the International Journal of an Emerging Trans discipline Volume 11, Located at <http://inform.nu/Articles/Vol11/ISJv11p107-123Taylor226.pdf> accessed on 28.07.2011.
- Tiew S W (2000), Characteristics of Self-citations in Journal of Natural Rubber Research 1988- 1997 : A Ten-year Bibliometric Study , Malaysian Journal of Library & Information Science, Vol.5, no.1, 95-10, Located at [http://eprints.rclis.org/bitstream/10760/9031/1/characteristics\\_of\\_self\\_citation\\_jnrr\\_july\\_2000.pdf](http://eprints.rclis.org/bitstream/10760/9031/1/characteristics_of_self_citation_jnrr_july_2000.pdf) accessed on 21.05.2011.
- Tilak Hazarika, Sarma Dipak and Gohain Anjan (2010), Impact of Library Collection Towards Doctoral Studies A Case Study on Citation Analysis of PhD Dissertations in the School of Science & Technology in Tezpur University, 7th Convention PLANNER - 2010, Tezpur University, Assam February p.18-20. Located at <http://shodhganga.inflibnet.ac.in/dxml/bitstream/handle/1944/972/32.pdf?sequence=1> accessed on 01.12.2011.
- Tonta, Yasar and Al, Umut (2006), Scatter and Obsolescence of Journals Cited in Dissertations of Librarianship, In Library & Information Science Research. Elsevier. p.281-296. Located at <http://eprints.rclis.org/handle/10760/9441> [http://hacettepe.academia.edu/Ya%C5%9FarTonta/Papers/197404/Scatter\\_and\\_Obsolescence\\_ofJournals\\_Cited\\_in\\_Dissertations\\_of\\_Librarianship](http://hacettepe.academia.edu/Ya%C5%9FarTonta/Papers/197404/Scatter_and_Obsolescence_ofJournals_Cited_in_Dissertations_of_Librarianship) accessed on 23.05.2011.

- Vaishnav A A and Dharmapurikar R G (1990), "Citation analysis of the Herald of Library science." Herald of Library science, Vol. 29(3-4), p. 252-260.
- Vallmitjana Núria and Sabate L. G. (2008), Citation Analysis of Ph.D. Dissertation References as a Tool for Collection Management in an Academic Chemistry Library, College & Research Libraries, January. Accessed at <http://crl.acrl.org/content/69/1/72.abstract> accessed on 21.08.2010.
- Van Raan, A.F.J. (2003). The use of bibliometric analysis in research performance assessment and monitoring of interdisciplinary scientific developments. Technikfolgenabschätzung, Theories und Praxis/ Technology Assessment- Theory and Practice, 12(1), p.20-29.
- Vij Rajiv (2001), Library and Information Science Abstract on CD-ROM a bibliometric study, ILA bulletin, Vol. 36(1)
- Von Sara Ungern-Sternberg Applications in teaching bibliometrics, PhD, Senior lecturer, Abo Akademi University, Department of Library and Information Science, FINLAND
- Weinstock M (1974), Citation Index, Encyclopaedia of library and information science, Vol.5, New York, Dekker, p.19.
- Wilkinson, J (1983) Legitimization of librarianship. Libri 33(1) March, p.39.
- Wole Michael Olatokun and Olayinka Makinde (2009), Citation analysis of dissertations submitted to the Department of Animal Science, University Of Ibadan, Nigeria, Annals of Library and Information Studies, Vol. 56, June, p.117. Accessed at [http://www.niscair.res.in/sciencecommunication/researchjournals/rejour/annals/annals2k9/alis\\_jun09.asp#117](http://www.niscair.res.in/sciencecommunication/researchjournals/rejour/annals/annals2k9/alis_jun09.asp#117) accessed on 24.12.2011.
- Wu Jun, Kong Weili and Zhang Xiaoqin (2009), Citation analysis of Journal Of Fishery Sciences Of China from 2006 to 2007, Chinese Agricultural Science Bulletin, GateGory Index : S9-5, DOI : CNKI:SUN:ZNTB.O.2009-20-074
- Yang Kiduk and Meho, Lokman I. (2006), Citation Analysis: A Comparison of Google Scholar, Scopus, and Web of Science, the American Society for Information Science and Technology, Volume: 43, Issue: 1, p.1. Located at [http://eprints.rclis.org/bitstream/10760/8605/1/Yang\\_citation.pdf](http://eprints.rclis.org/bitstream/10760/8605/1/Yang_citation.pdf) , and

<http://www.mendeley.com/research/a-phylogenetic-hypothesis-for-passerine-birds-taxonomic-and-biogeographic-implications-of-an-analysis-of-nuclear-dna-sequence-data-1/> accessed on 27.03.2011.

- Zabed Ahmed S. M. and Md. Anisur Rahman (2009), Lotka's law and authorship distribution in nutrition research of Bangladesh, *Annals of Library and Information Studies*, Vol. 56, June 2009, p.95. Accessed at [http://www.niscair.res.in/sciencecommunication/researchjournals/rejour/annals/annals2k9/alis\\_jun09.asp#95](http://www.niscair.res.in/sciencecommunication/researchjournals/rejour/annals/annals2k9/alis_jun09.asp#95) accessed on 27.12.2011.
- Zafrunnisha N. And Reddy V. Pulla (2011), Citation Analysis of PhD theses in Psychology: A Quantitative Analysis, *Journal of Library and Information Science*, Volume 5 (1) Accessed at <http://indianjournals.com/ijor.aspx?target=ijor:pjolis&volume=5&issue=1&article=010> accessed on 29.03.2012.
- Zandian Fatemeh (2009), A Citation Analysis of M.A Thesis in Library and Information Science (LIS) during 2001-2006, *Library and Information Research Journal*, Vol 8, No 3 (1386) Located at <http://jm.um.ac.ir/index.php/riis/article/view/5724> accessed on 30.06.2011.
- Zhai Zi-Yang, Wu Xiu-Fang, Zhang Yue-Hong (Helen) (2009), SCI citation analysis and impact factor prediction of JZUS-A in 2008, *J Zhejiang Univ Sci A* 2009 10(1), p.149-150. Located at [http://www.zju.edu.cn/jzus/download/IF\\_pred\\_JZUSA\\_08.pdf](http://www.zju.edu.cn/jzus/download/IF_pred_JZUSA_08.pdf) accessed on 12.10.2011.
- Zhao Dangzhi (2006), Dispelling the Myths Behind First-author Citation Counts , In 69th Annual Meeting of the American Society for Information Science and Technology (ASIST), Austin (US), 3-8 November 2006. Richard B. Hill. (Published) [Conference Paper] Located at E-LIS. E-prints in Library and Information Science, <http://eprints.rclis.org/handle/10760/8607> accessed on 30.12.2011.
- Ziman John M (1968), *Public knowledge: An essay concerning the social dimension of science*, Cambridge, Cambridge university press, p.58.
- Zipf, G. K. (1949) "Human Behaviour and the Principle of Least Effort" Reading, MA: Addison- Wesley Publishing co, p.34.

## Appendix

### Appendix 1: Research work carried out using Citation Analysis from Indian Universities (Ph. D Thesis)

| Sr. No. | Name of Researcher | Title of Research work   | Place     | Year of Award |
|---------|--------------------|--|-----------|---------------|
| 1       | Sengupta I         | Recent direction of growth a biomedical knowledge: An analytical study based on observed changes in scientific impact on serial publications | Calcutta  | 1983          |
| 2       | Singh S M          | The use of social science literature in India: A bibliometric study  | Banaras   | 1983          |
| 3       | Mahapatra M        | Growth of literature and citation pattern among the Indian journals in the field of Botany 1950-1980.  | Bardawan  | 1984          |
| 4       | Sengupta I N       | Bibliometric analysis of the impact of the growth of biomedical knowledge on the other biological and medical science.                       | Karnataka | 1984          |
| 5       | Sangam S L         | Citation analysis of doctoral dissertations in social science accepted by Karnataka University during 1964-1982.                             | Gulbarga  | 1986          |
| 6       | Paul M Roy         | Bibliometric analysis and evaluation of Indian research writing in Physics.  | Madurai   | 1986          |
| 7       | Vyas S D           | Bibliographical controls of social science literature in post  | Rajasthan | 1986          |

|    |                      |   |           |      |
|----|----------------------|---|-----------|------|
|    |                      | independent India.  |           |      |
| 8  | Taher Mohd.          | Bibliometric analysis of the literature in the field of Islamic studies.  | Calcutta  | 1989 |
| 9  | Savanur S K          | Reviewing of library science Books: A content analysis approach.  | Karnataka | 1990 |
| 10 | Kannappanavar<br>B U | Citation analysis of Doctoral Dissertations in library and information science accepted by the universities in Karnataka.   | Karnataka | 1991 |
| 11 | Parvathamma N        | Trends in the growth in Indian earth science literature 1918-1988: A bibliometric study.  | Gulbarga  | 1991 |
| 12 | Rajendra Prasad      | Validity of bibliometric laws in the field of social sciences.  | Banaras   | 1991 |
| 13 | Berhamuddin M        | Indian contribution to American studies: An investigation in to growth of literature using the bibliometric analysis.   | Jiwaji    | 1992 |
| 14 | Maheswarappa<br>B S  | A bibliometric analysis of Physiopathology literature.  | Gulbarga  | 1992 |
| 15 | Ratnakar A           | Trends in scientific communication in India historic sociometric and bibliographic analysis of the scientific journals in physical science specially physics and astronomy. | Karnataka | 1992 |

|    |                  |  |             |      |
|----|------------------|--|-------------|------|
| 16 | Shailendra Kumar | Information sources in history of science in India: A scientometrics study of periodical literature.   | Rajasthan   | 1992 |
| 17 | Tripathi Tridib  | Growth and development of Indian library and information science periodical literature from 1920-1985: A bibliometric study.   | Bardawan    | 1992 |
| 18 | Mapatra G        | Citation pattern among the Indian library and information science in English from 1975-1985.   | Utkal       | 1993 |
| 19 | Arora J          | Bibliometric analysis and bibliographic control of literature in immunology.   | Rajasthan   | 1994 |
| 20 | Binwarilal       | Bibliometric study of contribution of made to documentation as reflected in select periodicals of library and information science published in India: A quantitative analysis 1969-1988. | Jiwaji      | 1994 |
| 21 | Munshi U M       | Assessment of agriculture research output: A bibliometric analysis of research output of Indian agriculture Universities.  | Jiwaji      | 1994 |
| 22 | Srivastava R     | An investigation in to the literature use pattern of researchers in chemistry: A bibliometric study.   | BHU         | 1994 |
| 23 | Vearma Maya      | Use pattern of literature in economic researchers: A bibliometric study.   | Ravishankar | 1994 |

|    |                  |  |            |      |
|----|------------------|--|------------|------|
| 24 | Humayoon Kabir S | Growth of Indian horticultural literature during 1980-1989 and the contribution of Indian horticultural scientist in foreign horticultural periodicals a quantitative study. | Bangalore  | 1996 |
| 25 | Jalaja V         | Bibliometric analysis of science journals published from India.  | Calicut    | 1996 |
| 26 | Sahu K C         | Literature use pattern in biosciences ecology, biochemistry, biophysics, physiology of the university of Sagar and Sambhalpur: A bibliometric study based on Ph. D thesis.   | H S Gour   | 1997 |
| 27 | Aravind N        | The literature of physical anthropology: A citation analysis.  | Padmawati  | 1997 |
| 28 | Misra R          | Citation analysis of Doctoral Dissertations in library and information science accepted by the universities of Orissa and Manipur till 1993: A comparative study.            | Sambhalpur | 1997 |
| 29 | Ravi S           | Nuclear science research productivity of Indian scientist: A bibliographic analysis.   | Annamalai  | 1997 |
| 30 | Thoidingian P D  | Citation analysis of the Ph. D thesis in social science accepted by Guwahati University during 1970-80.  | Manipur    | 1997 |



|    |               |  |           |      |
|----|---------------|--|-----------|------|
| 31 | Meera B M     | Statistical quality control studies in Library and information science   | Bangalore | 1998 |
| 32 | Deerendra P T | Bibliometric analysis of citation pattern in Indian periodical literature in economics.                                | Osmania   | 1999 |
| 33 | Sacharn Anita | Scientometrics study of chemical literature cited in Doctoral thesis of chemistry submitted to the university of Jammu | Jammu     | 1999 |

(Kannappanavar B U and Vijay Kumar M (2000), Fifty years of LIS research in India: Trends and developments, SERLS journal of information management, Vol. 37 (4), P. 267-300 )

#### **Appendix -2: Universities in Western India.**

| Sr. No. | State       | University  |
|---------|-------------|---|
| 1       | Maharashtra | Amravati University, Amravati                                   |
| 2       | Maharashtra | Bharati Vidyapeeth, Pune  |
| 3       | Maharashtra | Central Institute of Fisheries Education, Varsova, Mumbai.      |
| 4       | Maharashtra | Deccan College of Post Graduate and Research Institute, Pune.   |
| 5       | Maharashtra | Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Krishinagar, Akola.   |
| 6       | Maharashtra | Gokhale Institute of Politics and Economics, Pune               |
| 7       | Maharashtra | Indian Institute of Technology, Mumbai.                         |
| 8       | Maharashtra | Indira Gandhi Institute of Development Research, Mumbai         |
| 9       | Maharashtra | International Institute for Population Sciences, Deonar, Mumbai |
| 10      | Maharashtra | Kavikulguru Kalidas Sanskrit Vishvavidyalayan, Ramtek, Nagpur   |
| 11      | Maharashtra | Konkan Krishi Vidyapeeth, Dapoli                                |
| 12      | Maharashtra | Mahatma Phule Vidyapeeth, Rahuri, Ahmednagar                    |
| 13      | Maharashtra | Marathwada Krishi Vidyapeeth, Parbhani                          |
| 14      | Maharashtra | University of Mumbai, Mumbai                                    |
| 15      | Maharashtra | Nagpur University, Nagpur                                       |
| 16      | Maharashtra | North Maharashtra University, Jalgaon                           |
| 17      | Maharashtra | University of Pune, Pune  |
| 18      | Maharashtra | Shivaji University, Kolhapur                                    |
| 19      | Maharashtra | SNDT Women's University, Mumbai                                 |
| 20      | Maharashtra | Tata Institute of Social Sciences, Mumbai                       |
| 21      | Maharashtra | Tilak Maharashtra Vidyapeeth, Pune                              |
| 22      | Maharashtra | Yashwantrao Chavan Maharashtra Open University, Nashik          |
| 23      | Maharashtra | Swami Ramanand Teerth Marathwada University, Nanded             |
| 24      | Maharashtra | Dr. Babasaheb Ambedkar Marathwada University, Aurangabad        |
| 25      | Gujrat      | Bhavnagar University, Bhavnagar                                 |
| 26      | Gujrat      | Dr. Babasaheb Ambedkar Open University, Ahemdabad               |
| 27      | Gujrat      | Gujrat Agricultural University, Banaskantha                     |
| 28      | Gujrat      | Gujrat Ayurved University, Jamnagar                             |
| 29      | Gujrat      | Gujrat Vidyapeeth, Ahemdabad                                    |
| 30      | Gujrat      | Gujrat University, Ahemdabad                                    |
| 31      | Gujrat      | M S University, Vadodara  |
| 32      | Gujrat      | North Gujarat University, Patan                                 |
| 33      | Gujrat      | Sardar Patel University, Vallabh Vidyanagar                     |
| 34      | Gujrat      | Sourashtra University, Rajkot                                   |
| 35      | Gujrat      | South Gujarat University, Surat                                 |

|    |     |                 |
|----|-----|-----------------|
| 36 | Goa | Goa University, |
|----|-----|-----------------|

### Appendix 3: Non-agricultural Universities in Western India

| Sr. No. | State | University   |
|---------|-------|--|
| 1       | MS    | Amravati University, Amravati                            |
| 2       | MS    | University of Mumbai, Mumbai                             |
| 3       | MS    | Nagpur University, Nagpur                                |
| 4       | MS    | University of Pune, Pune                                 |
| 5       | MS    | Shivaji University, Kolhapur                             |
| 6       | MS    | SNDT Women's University, Mumbai                          |
| 7       | MS    | Yashwantrao Chavan Maharashtra Open University, Nashik   |
| 8       | MS    | Swami Ramanand Teerth Marathwada University, Nanded      |
| 9       | MS    | Dr. Babasaheb Ambedkar Marathwada University, Aurangabad |
| 10      | MS    | North Maharashtra University, Jalgaon                    |
| 11      | MS    | Tilak Maharashtra Vidyapeeth, Pune                       |
| 12      | MS    | Bharati Vidyapeeth, Pune                                 |
| 13      | Guj   | Bhavnagar University, Bhavnagar                          |
| 14      | Guj   | Gujrat Vidyapeeth, Ahmadabad                             |
| 15      | Guj   | M S University, Vadodara                                 |
| 16      | Guj   | North Gujarat University, Patan                          |
| 17      | Guj   | Sardar Patel University, Vallabh Vidyanagar              |
| 18      | Guj   | Sourashtra University, Rajkot                            |
| 19      | Guj   | South Gujrat University, Surat                           |

|    |     |                              |
|----|-----|------------------------------|
| 20 | Guj | Gujrat University, Ahmadabad |
| 21 | Goa | Goa University, Goa          |

**Appendix- 4: PhD degrees awarded in LIS: Western Indian Universities. (1980-2010)**

| <b>Sr. No.</b> | <b>Research Student</b> | <b>Research Guide</b> | <b>Date of Award</b> | <b>Title of Research Study</b>  | <b>University</b>  | <b>State</b> |
|----------------|-------------------------|-----------------------|----------------------|---|--------------------|--------------|
| 1              | Konnur M B              | Riswadkar M R         | 1986                 | Transnational Library Relation : The Indo-American experience   | University of Pune | MS           |
| 2              | Ganpule S R             | Riswadkar M R         | 1987                 | Measuring library effectiveness   | University of Pune | MS           |
| 3              | Rajashekhar T B         | Mahajan S G           | 1989                 | GENBIBCON: A generalized approach to analysis<br>definition and conversion of heterogenous bibliographic database formats Vol 2 additional notes and program listing. | University of Pune | MS           |
| 4              | Khanna B M              | Riswadkar M R         | 1990                 | Meteorological data in India: its origin development and management in Indian libraries.  | University of Pune | MS           |
| 5              | Narayana G J            | Anderson B            | 1991                 | Information as a commodity: An inquiry into the characteristics of knowledge.   | University of Pune | MS           |
| 6              | Sengupta Sivani         | Riswadkar M R         | 1992                 | Library and Information science in India in the 1990s   | University of Pune | MS           |
| 7              | Mutrthy E S             | Mahajan S G           | 1992                 | Integrated information system for recently sensed data  | University of Pune | MS           |
| 8              | Rao M M                 | Mahajan S G           | 1993                 | Natural language versus controlled vocabulary in information retrieval: A case study in soil mechanics.   | University of Pune | MS           |

|    |                  |               |      |  |                    |    |
|----|------------------|---------------|------|--|--------------------|----|
| 9  | Vengan Ramaswamy | Kamath V A    | 1995 | Library support for technology transfer: A three group user behaviour analysis.  | University of Pune | MS |
| 10 | Shukla M D       | Riswadkar M R | 1995 | Evaluation of abstracting services in the field of bio-mass: A study of coverage overlap, time lag; indexing and Indian contribution.        | University of Pune | MS |
| 11 | Deshpande N J    | Mahajan S G   | 1998 | The role of district libraries in the development of public library movement in MS.  | University of Pune | MS |
| 12 | Pharande C P     | Mahajan S G   | 1998 | Organization and management of Marathi manuscripts in India with special reference to MS.  | University of Pune | MS |
| 13 | Satarkar S P     | Ganpule S R   | 1998 | Staffing pattern in college library case study of MS   | University of Pune | MS |
| 14 | Kaul H K         | Konnur M B    | 1998 | Barriers of resource sharing in library networks: An analysis of DELNET.   | University of Pune | MS |
| 15 | Pandit A M       | Ganpule S R   | 1999 | Assessment of the treatment of statistical sciences in the seventh edition of colon classification   | University of Pune | MS |
| 16 | Phadke D N       | Ganpule S R   | 1999 | Use of geographical information (GIS) in library   | University of Pune | MS |
| 17 | Patil S K        | Mahajan S G   | 1999 | Evaluation of library services of non agricultural university libraries in MS with special reference to Jayakar Library, University of Pune. | University of Pune | MS |
| 18 | Kakodkar Archana | Konnur M B    | 2000 | Area study of Latin America and the Caribbean  | University of Pune | MS |

|    |                              |                        |      |  |                    |    |
|----|------------------------------|------------------------|------|--|--------------------|----|
| 19 | Waydande Hindurao            | Ganpule S R            | 2001 | Behaviour pattern of users in academic and research libraries : With special reference to central library of IIT, Bombay.  | University of Pune | MS |
| 20 | Abraham Philips              | Konnur M B             | 2001 | Computer technology: it's application in libraries and information centres in the western India region a status study.   | University of Pune | MS |
| 21 | Shyama Rajaram               | Konnur M B             | 2002 | Human relations in librarianship: A study of interaction centres with the users.   | University of Pune | MS |
| 22 | Ramesh Kundra                | Rao J K<br>Ravichandra | 2003 | Quantitative analysis of medical literature in India: A bibliographic study  | University of Pune | MS |
| 23 | Khot Namita Babasaheb        | Konnur M B             | 2003 | A critical study of the university grant commission contribution to development of university libraries in western India.  | University of Pune | MS |
| 24 | Pange Babasaheb<br>Murlidhar | Deshpande N J          | 2004 | Conservation and preservation of library material with special reference to digitization rare materials  | University of Pune | MS |
| 25 | Shevale Nanaji G             | Prasad A R D           | 2004 | A study of capability of AACR2 , MARK 21 & UNISIS  | University of Pune | MS |
| 26 | Tripathi Aditya              | Prasad A R D           | 2005 | Design & development of multilingual information system with numeric MARK  | University of Pune | MS |
| 27 | Karnik P N                   | Ganpule S R            | 2005 | Assessment of contribution of a public library to the society with special reference to cultural & literary development: A case study of Mumbai marathi granth sasngrahalaya | University of Pune | MS |
| 28 | Ramadasi Nagnath R           | Patil S K              | 2005 | Digitization of Heritage document  | University of Pune | MS |



|    |                      |                     |      |  |                    |    |
|----|----------------------|---------------------|------|--|--------------------|----|
| 29 | Srechaiwong Pornparn | Patil S K           | 2005 | The usage of internet among state university students in the north of Thailand                               | University of Pune | MS |
| 30 | Patitungkho Kingkaew | Deshpande N J       | 2006 | Information seeking behaviour of the teachers and the students in Rajabhat universities in Bangkok           | University of Pune | MS |
| 31 | Asemi Asefeh         | Deshpande N J       | 2006 | Impact of information technology in the development of medical libraries & information centres in IMSU, Iran | University of Pune | MS |
| 32 | Mansour Tajdaran     | Singh Surya Nath    | 2006 | A study of knowledge skills and attitude of users to services in academic libraries in Tehran (Iran)         | University of Pune | MS |
| 33 | Bibhuti Bhusan Sahoo | Rao J K Ravichandra | 2007 | A scientometrics study of literature in software studies in India with a comparison to the world literature  | University of Pune | MS |
| 34 | Anthony Jose         | Prasad A R D        | 2007 | Design and development of a rule based expert system for Anglo American Cataloguing Rules                    | University of Pune | MS |
| 35 | Pathak Sandeep Kumar | Deshpande N J       | 2007 | Use of electronic journals in astronomy and astrophysics libraries in India                                  | University of Pune | MS |
| 36 | Mohd Ahsan Ullah     | Deshpande N J       | 2007 | Present status and future needs of public libraries in Bangladesh  | University of Pune | MS |
| 37 | Naik K Ashok         | Konnur M B          | 2008 | The public libraries legislation in Goa : A critical study   | University of Pune | MS |
| 38 | Weersooriya W A      | Deshpande N J       | 2008 | Human resource planning in university libraries in Sri Lanka   | University of Pune | MS |
| 39 | Rajendra Aparna      | Konnur M B          | 2008 | Music libraries in India   | University of Pune | MS |

|    |                    |                  |      |   |                    |    |
|----|--------------------|------------------|------|---|--------------------|----|
| 40 | Zal Zdeh Ibrahim   | Singh Surya Nath | 2008 | The use of Information technology in academic department of library and information science in Iranian Universities                                   | University of Pune | MS |
| 41 | Gaikwad D T        | Sengupta Shivani | 2008 | Impact of electronic media on special libraries   | University of Pune | MS |
| 42 | Sakhare Rajendra R | Patil S K        | 2008 | The need for arranging subject headings to Sanskrit and Marathi manuscripts : A case study  | University of Pune | MS |
| 43 | Kanetkar Jayashree | Deshpande N J    | 2008 | Evaluation of internet based defence related resources: Access reservation for digital library  | University of Pune | MS |
| 44 | Barve Sunita       | Prasad A R D     | 2009 | An evaluation of open source software for building digital libraries  | University of Pune | MS |
| 45 | Kulkarni S N       | Patil S K        | 2009 | Information services and their efficacy of science libraries in Pune metropolitan area: A critical study  | University of Pune | MS |
| 46 | Patil Vinay B      | Patil S K        | 2010 | Organization & Collection & Services of College Libraries affiliated to the North MS University Jalgaon: with special reference to assessment by NAAC | University of Pune | MS |
| 47 | Thaotip Laksana    | Patil S K        | 2010 | Impact of open access (OA) publications on library and information science community in Bangkok metropolitan universities in Thailand: A              | University of Pune | MS |

|    |                           |                  |      |   |                    |    |
|----|---------------------------|------------------|------|---|--------------------|----|
|    |                           |                  |      | study   |                    |    |
| 48 | Maryam Salami             | Singh Surya Nath | 2010 | Use of ICT in Pharmacology and allied Sciences<br>Libraries and Information Centres of Iran   | University of Pune | MS |
| 49 | Dutta Biswanath           | Prasad A R D     | 2010 | Generating Web Based information Services using Semantic Web Technology   | University of Pune | MS |
| 50 | Seth, Renu                | Prasad A R D     | 2010 | Interoperability of Metadata schema for digital repositories  | University of Pune | MS |
| 51 | Sahu Hemant Kumar         | Singh Surya Nath | 2010 | Information Seeking behaviour of Users in Astronomy Information centres & Libraries in India: The Impact of New information Technology  | University of Pune | MS |
| 52 | Kulkarni Manoj Krishnarao | Deshpande N J    | 2010 | Survey of Libraries of state administrative training institutes (ATIS) in India with special reference to quality library services  | University of Pune | MS |
| 53 | Oak, Meenal               | Patil S K        | 2011 | Study of select libraries of Management Institutes in India with special reference to Institutions within the Jurisdiction of University of Pune with relevance to networking accessibility and services to the user. | University of Pune | MS |

|    |                                 |               |      |   |                           |    |
|----|---------------------------------|---------------|------|---|---------------------------|----|
| 54 | Bakkannanava Nagappa            | Patil S K     | 2009 | Design and development of information system for marine engineering libraries   | University of Pune        | MS |
| 55 | Raool, Aditi                    | Deshpande N J | 2011 | Evaluation for knowledge management systems used in IT companies in Pune.   | University of Pune        | MS |
| 56 | Kaul Sangeeta                   | Konnur M B    | 2009 | Knowledge discovery through library networks: methodology for developing knowledge based model library network for India              | University of Pune        | MS |
| 57 | Dahibhate Nandkumar Bhalchandra | Patil S K     | 2011 | Patent literature in chemical sciences: An analytical study of selected countries   | University of Pune        | MS |
| 58 | Rajyalakshmi D                  | Kumar P S G   | 1992 | Impact of Ranganathan on AARC 2   | Nagpur University, Nagpur | MS |
| 59 | Balekar Rajashekar              | Kumar P S G   | 1994 | Impact of library legislation on public library development in MS   | Nagpur University, Nagpur | MS |
| 60 | Wanderi Muagai Onesmus          | Kumar P S G   | 1994 | Public library provision and document problems in developing countries: A study in Kenya and Indian context                           | Nagpur University, Nagpur | MS |
| 61 | Sinnarkar S                     | Kumar P S G   | 1997 | Factors that need to be consider in creating a bibliographic dataset: A stud with special reference in indexing of Indian environment | Nagpur University, Nagpur | MS |
| 62 | Ramachandran R                  | Kumar P S G   | 1997 | Patent document as a source of technical information for industrial development : Indian Scenario                                     | Nagpur University, Nagpur | MS |
| 63 | Patil Y M                       | Kumar P S G   | 1998 | Design and development of an information system for soil survey and land use planning   | Nagpur University, Nagpur | MS |

|    |               |             |      |  |                           |    |
|----|---------------|-------------|------|--|---------------------------|----|
| 64 | Kawale A V    | Kumar P S G | 1999 | Perspective and plan for the establishment of national information centre on petroleum                                   | Nagpur University, Nagpur | MS |
| 65 | Deshpande D R | Kumar P S G | 1998 | University library finance in MS   | Nagpur University, Nagpur | MS |
| 66 | Nahale U P    | Kumar P S G | 2002 | Working and finance of aided public libraries in MS with special reference to Nagpur division                            | Nagpur University, Nagpur | MS |
| 67 | Paradkar A    | Kumar P S G | 2003 | Structure and development of non-agricultural university libraries on MS: A critical study                               | Nagpur University, Nagpur | MS |
| 68 | Kale K B      | Kumar P S G | 2004 | Security care and maintenance of books in university libraries in India: A critical study                                | Nagpur University, Nagpur | MS |
| 69 | Cyraic Jiji   | Kumar P S G | 2004 | Gray literature in Indian agricultural research in relation to soil science  | Nagpur University, Nagpur | MS |
| 70 | Sambare A P   | Kumar P S G | 2004 | growth and development of NUL in the changing scenario of IT   | Nagpur University, Nagpur | MS |
| 71 | Dakhole P S   | Kumar P S G | 2004 | Development of Ayurved college libraries in India with special reference to Vidharbha region                             | Nagpur University, Nagpur | MS |
| 72 | Gawali S N    | Kumar P S G | 2004 | Indian reference source on science and technology: An evaluation   | Nagpur University, Nagpur | MS |
| 73 | Deshpande R M | Kumar P S G | 2004 | Study of customer satisfaction management in libraries and information centres of regional engineering colleges in India | Nagpur University, Nagpur | MS |

|    |                   |                |      |   |                           |    |
|----|-------------------|----------------|------|---|---------------------------|----|
| 74 | Hirwade M A       | Rajyalakshmi D | 2004 | Valuation of websites of Indian university with special reference to library web pages                          | Nagpur University, Nagpur | MS |
| 75 | Nikose S N        | Rajyalakshmi D | 2004 | Coping with the new technology experience of university libraries in MS   | Nagpur University, Nagpur | MS |
| 76 | Basher S A        | Kumar P S G    | 2004 | Role of BANSOC in scientific technical information system and services in Bangladesh                            | Nagpur University, Nagpur | MS |
| 77 | Hirwade A W       | Kumar P S G    | 2006 | Patent information sources on Internet : An evaluation  | Nagpur University, Nagpur | MS |
| 78 | Fulmaly S R       | Rajyalakshmi D | 2006 | Study of libraries and their services of the rehabilitation institutes for the disabled in Gujarat and MS state | Nagpur University, Nagpur | MS |
| 79 | Taksande P        | Kumar P S G    | 2006 | Evaluation of the role of UGC on development of college libraries   | Nagpur University, Nagpur | MS |
| 80 | Munshi Amita      | Rajyalakshmi D | 2007 | Computerization in University Libraries of India: A Critical study  | Nagpur University, Nagpur | MS |
| 81 | Jain P B          | Kumar P S G    | 2007 | Performance of College : A Critical study of college Libraries under the Jurisdiction of Nagpur University      | Nagpur University, Nagpur | MS |
| 82 | Bhongade Devendra | Kumar P S G    | 2008 | Computerization of Library Catalogue and OPAC services of Institutes of Higher Learning in Maharashtra          | Nagpur University, Nagpur | MS |
| 83 | Agashe Ajay       | Kumar P S G    | 2008 | A Study of Dr. P.S.G. Kumar's Academic contribution in Library and Information Science                          | Nagpur University, Nagpur | MS |

|    |                     |                |      |  |                           |    |
|----|---------------------|----------------|------|--|---------------------------|----|
| 84 | Kapade Deepak       | Rajyalakshmi D | 2008 | A Study of CAS services in CSIR,ICAR and ICMR Libraries in India   | Nagpur University, Nagpur | MS |
| 85 | Chikate Anil        | Kumar P S G    | 2008 | Government information initiatives of India, since 1995: A study   | Nagpur University, Nagpur | MS |
| 86 | Prakashe Veena      | Kumar P S G    | 2008 | Metropolitan Network for Nagpur City   | Nagpur University, Nagpur | MS |
| 87 | Ugle Vaishali       | Deshpande D R  | 2009 | Reading habits among science college teachers in Vidharbha Region  | Nagpur University, Nagpur | MS |
| 88 | Tirpude C. R.       | Deshpande D R  | 2009 | Application of IT in the Engineering College Libraries with special reference to Vidharbha Region                      | Nagpur University, Nagpur | MS |
| 89 | Gabhane D R.        | Deshpande D R  | 2009 | Professionals attitude towards library computerization : A study of University & college libraries in Vidharbha Region | Nagpur University, Nagpur | MS |
| 90 | Taksande Gautam     | Deshpande D R  | 2009 | Reading Habits among Science College Teachers in Vidharbha Region  | Nagpur University, Nagpur | MS |
| 91 | Lihitkar Shalini R. | Rajyalakshmi D | 2010 | A Study of Information Systems and Networks in India: with special reference to Maharashtra                            | Nagpur University, Nagpur | MS |
| 92 | Paradkar Parag      | Kumar P S G    | 2010 | Role play by ILA and IASLIC in the development of Librarianship  | Nagpur University, Nagpur | MS |

|     |   |                 |      |   |                           |    |
|-----|---|-----------------|------|---|---------------------------|----|
| 93  | Sable S.N.                              | Kumar P S G     | 2010 | Literature from Vidharbha in Marathi (1975-1999) a Survey and Bibliometrics study.  | Nagpur University, Nagpur | MS |
| 94  | Kude N.S.                               | Nahle U P       | 2010 | A study of Library software used in health science college libraries in MS  | Nagpur University, Nagpur | MS |
| 95  | Basole Medha G                          | Satarkar S P    | 2008 | A critical study of university grants commission assistance to college libraries: Case study of colleges under SRTMU Nanded                   | SRTM University, Nanded   | MS |
| 96  | Aghav Udhav R                           | Satarkar S P    | 2009 | Industrial libraries case study of MS   | SRTM University, Nanded   | MS |
| 97  | Siddiqui Eras Azeeza Mohd Zulfekaruddin | Satarkar S P    | 2007 | Application of teaching techniques to library and information science education: A case study of curriculum development committee report 2001 | SRTM University, Nanded   | MS |
| 98  | Mundhe Baliram                          | Satarkar S P    | 2004 | Collection development in agricultural university libraries: Case study of MS   | SRTM University, Nanded   | MS |
| 99  | Gajway P. M.                            | Bhagawatkar V M | 2001 | History of public Library movement in Vidharbha Region of MS w.e.f. 1850-1970   | SGBA University, Amravati | MS |
| 100 | Deshmukh P. P.                          | Kumar P S G     | 2001 | Citation Analysis of Ph.D. thesis submitted to P.K.V. during 1990-1994  | SGBA University, Amravati | MS |
| 101 | Kherde M. R.                            | Kumar P S G     | 2002 | A critical study of synthesis in DDC  | SGBA University, Amravati | MS |



|     |                   |                |      |   |                           |    |
|-----|-------------------|----------------|------|---|---------------------------|----|
| 102 | Choukhande V G    | Kumar P S G    | 2003 | Analytical Study of information needs and use pattern of faculty members and research scholars of Amt. University                       | SGBA University, Amravati | MS |
| 103 | Mandgaonkar K. O. | Kumar P S G    | 2004 | College Library Finances: A critical study of college Lib. under to jurisdiction of Amt. Uni.   | SGBA University, Amravati | MS |
| 104 | Khokale Rewati    | Rajyalakshmi D | 2007 | Bibliometric analysis of PhD thesis awarded to Amravati university Amravati: a study of information flow in some selective disciplines. | SGBA University, Amravati | MS |
| 105 | Tankar Amit S     | Rajyalakshmi D | 2007 | Role of Public Lib. as community centres and their services to society to society in Vidharbha region of MS state.                      | SGBA University, Amravati | MS |
| 106 | Rokade S. M.      | Rajyalakshmi D | 2007 | Information services in Agricultural Uni.Lib. & Indian council of Agricultural Lib. & Research Institute lib. In Inf. Sci. in MS.       | SGBA University, Amravati | MS |
| 107 | Gawande Nilesh    | Rajyalakshmi D | 2008 | Literature use pattern in doctoral research at IIT Bombay: A bibliometric study during 1995-2000  | SGBA University, Amravati | MS |
| 108 | Wagh Sanjay       | Rajyalakshmi D | 2008 | HRD of library Personnel in the perspective of IT: A study of University Library in MS  | SGBA University, Amravati | MS |
| 109 | Patil Harsha      | Kumar P S G    | 2008 | Use of IT in Library & Information Science schools in India   | SGBA University, Amravati | MS |

|     |                            |                    |      |  |                            |    |
|-----|----------------------------|--------------------|------|--|----------------------------|----|
| 110 | Dhakane Balaji N           | Vaishnav A A       | 2006 | Granthmitra N V Deshpande yancha granthalaya chalwalitil sahabhag: Eaik abhyas   | BAM University, Aurangabad | MS |
| 111 | Dalve (Patil) Daya B       | Mohal S M          | 2004 | Literature use pattern by the researcher in social sciences: A bibliometric analysis of doctoral thesis submitted to Dr. Babasaheb Ambedkar Marathwada university Aurangabad | BAM University, Aurangabad | MS |
| 112 | Lomte S S                  | Mishra Shivshankar | 2002 | Some aspects of computer aided library and information management  | BAM University, Aurangabad | MS |
| 113 | Kamble (Salampure) Veena M | Mohal S M          | 2005 | Information seeking behaviour of social scientists in Marathwada   | BAM University, Aurangabad | MS |
| 114 | Kumbhar Rajendra Madhavrao | Vaishnav A A       | 2002 | Construction of a vocabulary control tool (Thesaurus) for library and information science  | BAM University, Aurangabad | MS |
| 115 | Veer Dharmaraj Kalyanrao   | Vaishnav A A       | 2002 | College of education libraries in MS: A survey   | BAM University, Aurangabad | MS |
| 116 | Sathe Vivek Sampatrao      | Lomte S S          | 2008 | A study of information services given in college libraries of Aurangabad district (MS)   | BAM University, Aurangabad | MS |
| 117 | Dahiphale Vikram U         | Mohal S M          | 2007 | MS til krushi vidyapeeth granthalya: Eaik servekshan   | BAM University, Aurangabad | MS |
| 118 | Vaishnav A A               | Bapat N G          | 1994 | Application of computer in library management with special reference to Marathwada university library  | BAM University, Aurangabad | MS |

|     |                    |                    |      |   |                            |    |
|-----|--------------------|--------------------|------|---|----------------------------|----|
| 119 | Chavan Shubhas P   | Wadikar S A        | 2005 | Dr. Babasaheb vidyapeetha antragat salgnnit mahavidyalayin granthalayacha vittiy vyavsthanacha abhayas samajik shashtre vidyashekhechya granthaya sharta vishayat | BAM University, Aurangabad | MS |
| 120 | Choure A A         | Vaishnav A A       | 2006 | Shri shetra pandharpuratil mathanacha sanskurtik sampreshan drusthine abhayas   | YCMO University, Nashik    | MS |
| 121 | Sewale Madhukar N  | Biyani Pramod      | 2006 | Yashwantrao chavan MS mukta vidyapeethya B. Lib and I Sc aani M. Lib and I Sc shikshankramache va sampreshan prakriyache mulyamapan                               | YCMO University, Nashik    | MS |
| 122 | Date Dhanashree A  | Gokhale Pratibha A | 2006 | Web content management (WCM) for library and information science: A study   | University of Mumbai       | MS |
| 123 | Gokhale Pratibha A | Ganpule S R        | 2000 | Grey literature: Generation, Access and Dissemination- A Study  | University of Mumbai       | MS |
| 124 | Joshi Medha V      | Parekh Harsha      | 2002 | Medline on CD-ROM: an analysis of user search behavior  | SNDT University, Mumbai    | MS |
| 125 | Tikam Madhuri V    | Sen Bharati        | 2007 | Promoting library services in colleges: potential and barriers  | SNDT University, Mumbai    | MS |
| 126 | Murari Durga       | Parekh Harsha      | 2006 | Information needs analysis and information seeking behaviour of entrepreneurs: with special reference to women  | SNDT University, Mumbai    | MS |
| 127 | Surati Daksha      |                    | 2000 | Library and information science education in Gujarat  | SNDT University, Mumbai    | MS |

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|-----|-----------------------|---------------|------|---|--|------|
| 128 | Nagarkar Shubhada     | Parekh Harsha | 2006 | Organisation of information for the world wide web: case study of fungal species  | SNDT University, Mumbai                      | MS   |
| 129 | Powdwal Sushama       | Parekh Harsha | 2007 | Solo librarians in Mumbai: A study  | SNDT University, Mumbai                      | MS   |
| 130 | Sen Bharati           | Ganpule S R   | 1997 | Management of introduction of information technology (IT) in the libraries in India   | SNDT University, Mumbai                      | MS   |
| 131 | Marolia Perin V       | Kamath V A    | 1996 | Expertise and qualities of special library staff in India   | SNDT University, Mumbai                      | MS   |
| 132 | Yagnik Shailesh R     | Raval C N     | 2009 | Information management in advertising industry in India   | SP University, Vallabh Vidyanagar            | GU J |
| 133 | Thaker Urmila A       | Naidu M K R   | 2002 | Computerization of university libraries in Gujarat state: A plan  | SP University, Vallabh Vidyanagar            | GU J |
| 134 | Bhavsar Vaishaliben L | Charan S M    | 2000 | A comparative and critical study of the university library organization in Gujarat state  | SP University, Vallabh Vidyanagar            | GU J |
| 135 | Kureshi Nazima U      | Vyas Krit M   | 2003 | Information seeking behaviour of education and training (DIETs) of GUJ: A study   | Gujarat Vidyapeeth, Ahemadabad               | GU J |
| 136 | Patel Raxa A          | Vyas Krit M   | 2005 | Information needs and seeking behaviour of the teachers of the teacher training colleges (B Ed. Colleges) of universities of GUJ state: A study | Gujarat Vidyapeeth, Ahemadabad               | GU J |
| 137 | Modi Bipin J          | Rawal C N     | 2008 | Networking module for pharmacy colleges in GUJ  | Hemchandracharya North GUJ University, Patan | GU J |

|     |                    |            |      |   |   |         |
|-----|--------------------|------------|------|---|---|---------|
| 138 | Shukla K H         | Charan S M | 2005 | A comprehensive study on rural studies college's, libraries affiliated to Hemchandracharya north GUJ university, Patan  | Hemchandracharya North<br>GUJ University, Patan | GU<br>J |
| 139 | Trivedi M J        | Charan S M | 2004 | Collected reading materials and services in allopathic Ayurvedic and Homeopathic medical college libraries of Gujarat: the necessity and future prospects of Allopathic, Ayurvedic and Homeopathic medical college library in Hemchandracharya north Gujarat University Patan | Hemchandracharya North<br>GUJ University, Patan | GU<br>J |
| 140 | Vyas H J           | Charan S M | 2004 | Development study of the women's libraries affiliated to the various universities of the Gujarat state  | Hemchandracharya North<br>GUJ University, Patan | GU<br>J |
| 141 | Patel Chandrakant  | Charan S M | 2002 | The contribution of the north Gujarat University library to the graduate and post-graduate education  | Hemchandracharya North<br>GUJ University, Patan | GU<br>J |
| 142 | Patel Yogeshkumar  | Charan S M | 2002 | The pattern of working and co-operation in the various sections of university libraries in the Gujarat state: with special reference to north Gujarat university library  | Hemchandracharya North<br>GUJ University, Patan | GU<br>J |
| 143 | Patel Ghanshyamlal | Charan S M | 2002 | Present day problems and their alleviation of University libraries in the Gujarat state: With the special reference to North  | Hemchandracharya North<br>GUJ University, Patan | GU<br>J |

|     |                     |             |      |  |   |         |
|-----|---------------------|-------------|------|--|---|---------|
|     |                     |             |      | Gujarat University library   |   |         |
| 144 | Bhatta K R          | Charan S M  | 2004 | Critical study of the reading material available in more than the century old public libraries of the Gujarat state        | Hemchandracharya North<br>GUJ University, Patan | GU<br>J |
| 145 | Pandya V C          | Charan S M  | 2002 | A comparative study of the manual and computerized systems in North Gujarat university library                             | Hemchandracharya North<br>GUJ University, Patan | GU<br>J |
| 146 | Pradhan Sanghamitra | Shukla K H  | 2008 | Motivation and performance level of library personnel in University library  | M S University,<br>Vadodara                     | GU<br>J |
| 147 | Gohel Batuk M       | Vyas Krit M | 2005 | Collection development in university libraries in Gujarat state: An evaluative and comparative study                       | Bhavnagar University,<br>Bhavnagar              | GU<br>J |
| 148 | Abbas Khan A A      | Gunjal S R  | 1999 | Citation analysis of the doctoral dissertations submitted to the Shivaji University, Kolhapur in Pure Sciences (1962-1992) | Shivaji University,<br>Kolhapur                 | MS      |
| 149 | Divatankar N L      | Gunjal S R  | 2007 | National information centre for sugar industry: A development plan   | Shivaji University,<br>Kolhapur                 | MS      |

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|-----|----------------------------|---------------------|------|--|---------------------------------|----|
| 150 | Hanchinal Veeresh B        | Karisiddappa C<br>R | 2007 | Curriculum design and strategy<br>formulation for user<br>education in the electronic environment<br>with special reference to academic<br>libraries in Mumbai             | Shivaji University,<br>Kolhapur | MS |
| 151 | Hanchinal Vidya<br>Veeresh | Karisiddappa C<br>R | 2007 | Impact of emerging enabling<br>technologies on<br>academic library and information<br>centres: Assessment of the state-of- the -<br>art in the selected colleges of Mumbai | Shivaji University,<br>Kolhapur | MS |
| 152 | Vasantha Kumar M           | Konnur P V          | 2007 | Status of medical college libraries in<br>Karnataka and<br>MS: A comparative study   | Shivaji University,<br>Kolhapur | MS |

**Appendix-5:Ongoing Research in LIS: Western Indian Universities.**

| <b>Sr. No.</b> | <b>Research Student</b> | <b>Research Guide</b> | <b>Title of Research Study</b>   | <b>University</b>  | <b>State</b> |
|----------------|-------------------------|-----------------------|--|--------------------|--------------|
| 1              | Pradhan Amita Sachin    | Deshpande N J         | Developing a model of information audit for engineering college librarian  | University of Pune | MS           |
| 2              | Bhadkamkar Swati Sanjay | Deshpande N J         | Designing of library use education for teachers and researchers of management institutes   | University of Pune | MS           |
| 3              | Guha Nabonita           | Prashad A R D         | A study of systematic web technologies to establish effective information retrieval system   | University of Pune | MS           |
| 4              | Borkar V M              | Deshpande N J         | Re-engineering college library systems: A futuristic study of college libraries under the jurisdiction of university of Pune   | University of Pune | MS           |
| 5              | Shah Avani              | Singh Surya Nath      | Trend and impact of modern communication technology on biomedical information centres and libraries in Western India   | University of Pune | MS           |
| 6              | Pownikar Shreenivas S   | Prashad A R D         | A retrieval model for bibliographic information based on morphological analysis of Marathi   | University of Pune | MS           |
| 7              | Shrivastav Rajendra K   | Prashad A R D         | Design on international gateway: A case study of solid state physics   | University of Pune | MS           |
| 8              | Bawadekar Nirupama      | Konnur M B            | Impact of information technology on the service provided by the library and information centres attached to the council of scientific and industrial research laboratories to support research and development | University of Pune | MS           |



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|----|----------------------------|------------------|--|---------------------------|----|
| 9  | Joshi Priyamvada           | Singh Surya Nath | Bridging traditional biomedical knowledge and modern science with special reference to MS  | University of Pune        | MS |
| 10 | Shelar Vandana             | Deshpande N J    | Developing information literacy module for undergraduate students in academic institutions affiliated to university of Pune district | University of Pune        | MS |
| 11 | Gangurde Lalita Hiranman   | Patil S K        | A study of financial management of university libraries in western India with special reference to university of Pune Library        | University of Pune        | MS |
| 12 | Sainul Aideen              | Prashad A R D    | A study on interoperable e-Governance metadata model   | University of Pune        | MS |
| 13 | Pillai Priya               | Deshpande N J    | Provision of library and information services for the visually impaired in India : A study   | University of Pune        | MS |
| 14 | Amin Saiful                | Prashad A R D    | A model for harvesting metadata from divergent information sources   | University of Pune        | MS |
| 15 | Desale Sanjay              | Kumbhar R M      | Development of semi automated depth classification scheme for physics : A study with special reference to emerging subject fields    | University of Pune        | MS |
| 16 | Alsubari Munasar Ali Ahmed | Deshpande N J    | Use of internet by the faculties of medicine in Yemeni Universities  | University of Pune        | MS |
| 17 | Pereira Shamin S           | Bansode S Y      | Information literacy of student of marine and its allied subjects in MS and Goa : A study  | University of Pune        | MS |
| 18 | Gawande S. N               | Kumar P S G      | Study of Developments of Agricultural University libraries in MS VIS-VIS various recommendations of Library committee of             | Nagpur University, Nagpur | MS |

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|    |                |                | ICAR  |                           |    |
| 19 | Khedkar A.D    | Kumar P S G    | Evaluation of Engineering College Libraries in Vidharbha Region   | Nagpur University, Nagpur | MS |
| 20 | Dave H.H       | Kumar P S G    | Performance evaluation of manuscripts libraries in MS.2000  | Nagpur University, Nagpur | MS |
| 21 | Sasi Kumar     | Kumar P S G    | Security care and maintenance of book in University libraries in India: a critical study  | Nagpur University, Nagpur | MS |
| 22 | Dange Nilema   | Kumar P S G    | Indian Library Literature: A Study of Books Published in India in English from the beginning till 2000 A.D                                | Nagpur University, Nagpur | MS |
| 23 | Kuffalikar C.R | Rajyalakshmi D | Three hundred years of Nagpur City: A Bibliographical study   | Nagpur University, Nagpur | MS |
| 24 | Rokde S.G      | Rajyalakshmi D | Learning aptitudes and Behavioural attitudes of LISc Students of LIS Schools affiliated to Nagpur University                              | Nagpur University, Nagpur | MS |
| 25 | Khobragade A.S | Rajyalakshmi D | Legal Aspects of Information with Special Reference to India  | Nagpur University, Nagpur | MS |
| 26 | Ratkanthiwar M | Rajyalakshmi D | Study of citation pattern of references in selected national and international library and information science journals during 1971-2000. | Nagpur University, Nagpur | MS |
| 27 | Khandal V.G    | Rajyalakshmi D | Growth and development of College libraries under the Shri. Shivaji Education Society, Amravati's : A study                               | Nagpur University, Nagpur | MS |

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|----|-----------------|---------------|---|---------------------------|----|
| 28 | Mankar S.W      | Deshpande D R | Resource Sharing amongst Engineering College Libraries in MS  | Nagpur University, Nagpur | MS |
| 29 | Kalambe K.P     | Deshpande D R | Use of IT and information seeking behaviour of journalists in the major daily newspapers Libraries in Nagpur city                 | Nagpur University, Nagpur | MS |
| 30 | Najeebuddin S   | Deshpande D R | A study on Library and Information Services in Medical College Libraries in MS  | Nagpur University, Nagpur | MS |
| 31 | Helonde G.V.    | Deshpande D R | Evaluation of Marathi Periodicals- A Bibliographic Study  | Nagpur University, Nagpur | MS |
| 32 | Chandekare U.K. | Deshpande D R | A study of Indian Reference Sources in Social Science (from 1900-2000)  | Nagpur University, Nagpur | MS |
| 33 | Thanekar A.G    | Deshpande D R | Perceptive plan for the development of Mahatma Gandhi International Hindi University Library.                                     | Nagpur University, Nagpur | MS |
| 34 | Deolankar R. P  | Patil Y M     | Information needs of Engineering faculty of Vidharbha Region – VIS A VIS Internet   | Nagpur University, Nagpur | MS |
| 35 | Dhawale K.      | Patil Y M     | Developing a Model Information System for Small Scale Industries in Vidharbha Region with Particular Emphasis on Nagpur District  | Nagpur University, Nagpur | MS |
| 36 | Raut V.D        | Nahle U P     | Model plan for networking and resource sharing in medical college libraries in MS   | Nagpur University, Nagpur | MS |
| 37 | Belsare S.V     | Nahle U P     | A study of infrastructural facilities and services of Govt. Medical College Libraries and private medical college libraries in MS | Nagpur University, Nagpur | MS |
| 38 | Shirke P        | Nahle U P     | Public Libraries Act in India: A Comparative  | Nagpur University,        | MS |

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|----|----------------|---------------|---|---------------------------|----|
|    |                |               | Study   | Nagpur                    |    |
| 39 | Bharambe V     | Nahle U P     | Study of finance in Allopathic Medical College Libraries in MS: With special reference to Vidharbha.      | Nagpur University, Nagpur | MS |
| 40 | Astunkar S.G   | Nahle U P     | Citation Analysis of Doctoral Theses in Economics accepted by Nagpur University Nagpur During 1981-2000   | Nagpur University, Nagpur | MS |
| 41 | Bhoyar A.      | Nahle U P     | Effectiveness of Public Libraries in Tribal Areas in MS with special reference to Nagpur Division         | Nagpur University, Nagpur | MS |
| 42 | Deshpande S    | Deshpande R M | Encyclopaedic Terms of Information Technology its interpretation in Marathi Language.                     | Nagpur University, Nagpur | MS |
| 43 | Diware K       | Deshpande R M | A Study of Information Seeking Behaviours/Reading Habits of High School Teacher & Students in Nagpur City | Nagpur University, Nagpur | MS |
| 44 | Mankar Archana | Deshpande R M | VRCE/VNIT Library Building Structure and Design: A Case study of past three Decades                       | Nagpur University, Nagpur | MS |
| 45 | Vyas S         | Deshpande R M | Cost effective analysis of periodicals in Print & Online in various Government Medical Colleges in MS     | Nagpur University, Nagpur | MS |
| 46 | Padir V.       | Deshpande R M | Historical and Technical Development of INFLIBNET: A Decade Study   | Nagpur University, Nagpur | MS |

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|----|------------------|--------------------|--|---------------------------|----|
| 47 | Pandya T.        | Deshpande R M      | Enforcement of AICTE/NBA directives to technical and engineering institutions in Vidharbha and Marathwada Regions      | Nagpur University, Nagpur | MS |
| 48 | Deshpande Sonali | Deshpande R M      | Institutional Repositories /Archival Initiatives managed by Electronic resources for faculty in technical institutions | Nagpur University, Nagpur | MS |
| 49 | Chafle A         | Deshpande R M      | Library Services and Publications undertaking by ICAR institutions in India  | Nagpur University, Nagpur | MS |
| 50 | Gade Manasi      | Deshpande R M      | Study of interiors and Furnishing in British Network Libraries in India  | Nagpur University, Nagpur | MS |
| 51 | Pendke P.        | Deshpande R M      | Encyclopaedic Directory of Library Software in India   | Nagpur University, Nagpur | MS |
| 52 | Malpe S          | Paradkar Aswini P. | Study of Zillah school libraries in Nagpur Region  | Nagpur University, Nagpur | MS |
| 53 | Giri S           | Paradkar Aswini P. | Bilingual Thesaurus of LIS: A pragmatic & thematic approach  | Nagpur University, Nagpur | MS |
| 54 | Lihitkar R.      | Paradkar Aswini P. | Application, Implication and Comparison of Library Software in college libraries affiliated to RTMNU.                  | Nagpur University, Nagpur | MS |
| 55 | Gedam Pranali    | Paradkar Aswini P. | Online Classification Schemes :A study   | Nagpur University, Nagpur | MS |
| 56 | Dadhe P.         | Kale Kishore B.    | Digitization of Manuscript and rare books : a case study of Dr.V.B.Alias B.K.Library, RTMNU                            | Nagpur University, Nagpur | MS |
| 57 | Jogy D           | Kale Kishore B.    | Bibliographical Control in IT literature in Vidharbha region   | Nagpur University, Nagpur | MS |

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|----|----------------|-------------------|---|---------------------------|----|
| 58 | Gadge Sharmila | Kale Kishore B.   | Application of IT in National Institute of Technical Libraries: A critical Study                        | Nagpur University, Nagpur | MS |
| 59 | Raibole S      | Kale Kishore B.   | Citation analysis of doctoral thesis in Political science accepted by Nagpur University up to 2005      | Nagpur University, Nagpur | MS |
| 60 | Pendam G       | Kale Kishore B.   | Changing trends in LISC: An analysis of theme of LIS conference /seminar etc                            | Nagpur University, Nagpur | MS |
| 61 | Mehar L        | Kale Kishore B.   | Growth and development of American Information Resource Centre in India : A study                       | Nagpur University, Nagpur | MS |
| 62 | Randhai S.T    | Kale Kishore B.   | Analytical study of CD-ROM Databases available in Traditional Universities and Research Libraries in MS | Nagpur University, Nagpur | MS |
| 63 | Sontakke V     | Kale Kishore B.   | Book Acquisition policy in conventional Indian University Libraries : A Critical study                  | Nagpur University, Nagpur | MS |
| 64 | Mamilwar M     | Kale Kishore B.   | Application of IT in Museum Libraries in India  | Nagpur University, Nagpur | MS |
| 65 | Kalambar S.M   | Kale Kishore B.   | Growth and Development of Missionaries Libraries and their services in MS: A study                      | Nagpur University, Nagpur | MS |
| 66 | Tarweed V.B    | Dakhole Pramod S. | Bibliometric study of Doctoral Thesis in Library & Information science submitted to Nagpur University.  | Nagpur University, Nagpur | MS |
| 67 | Abide M. G     | Dakhole Pramod S. | Information needs & seeking behaviour of faculty members in Nagpur University                           | Nagpur University, Nagpur | MS |
| 68 | Deshmukh K. S  | Dakhole Pramod S. | Information Sources for Pharmaceutical Industries: A Bibliographic Study                                | Nagpur University, Nagpur | MS |

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|----|------------------|--------------------|---|---------------------------|----|
| 69 | Bhakte A. Y.     | Dakhole Pramod S.  | Legal Information Services rendered by Law College Libraries in Vidharbha region.                                 | Nagpur University, Nagpur | MS |
| 70 | Deote D. W       | Dakhole Pramod S.  | Computer Application In College Libraries In Semi-Urban area of Vidharbha region                                  | Nagpur University, Nagpur | MS |
| 71 | Bhimanwar V.K.   | Dakhole Pramod S.  | Status of Libraries of Higher secondary School with special reference to Vidharbha region.                        | Nagpur University, Nagpur | MS |
| 72 | Dahake V. A      | Dakhole Pramod S.  | Literary Contribution of Library Professionals in MS: A Bibliographic Study.                                      | Nagpur University, Nagpur | MS |
| 73 | Sambhare         | Dakhole Pramod S.  | Application of new technologies to the News Paper Libraries In Vidharbha & Marathwada region: A Comparative Study | Nagpur University, Nagpur | MS |
| 74 | Bannore S.V.     | Dakhole Pramod S.  | A study of school libraries in Gadchiroli Zillah  | Nagpur University, Nagpur | MS |
| 75 | Jaulkar S        | Dakhole Pramod S.  | Aided and unaided Physical Education colleges in MS: A Study  | Nagpur University, Nagpur | MS |
| 76 | Gadkari Manjusha | Hirwade Mangala A. | Institutional Repositories in India: A study  | Nagpur University, Nagpur | MS |
| 77 | Siagal Kadambari | Hirwade Mangala A. | Indian Open Access Journals: A Critical Study   | Nagpur University, Nagpur | MS |
| 78 | Cristy Cynita    | Hirwade Mangala A. | Study of E-Book Digital Libraries: with special reference to Digital library of India                             | Nagpur University, Nagpur | MS |
| 79 | Bherwani Mohini  | Hirwade Mangala A. | Metadata in Open Access Context: A Critical Study   | Nagpur University, Nagpur | MS |
| 80 | Borkar Vikas     | Hirwade Mangala A. | Online Services of Indian Government Portals: A Critical Study  | Nagpur University, Nagpur | MS |

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|----|----------------------|---------------------|---|---------------------------|----|
| 81 | Dixit Swati          | Hirwade Mangala A.  | Traditional Knowledge Protection in India: A Critical Study   | Nagpur University, Nagpur | MS |
| 82 | Dube Manju           | Hirwade Mangala A.  | Digital Copyright in India: A Study   | Nagpur University, Nagpur | MS |
| 83 | Bagul Ravindra B     | Nikose Satyaprakash | Use of E-Journals in University Libraries in MS: A Study  | Nagpur University, Nagpur | MS |
| 84 | Ingole Ramesh K      | Nikose Satyaprakash | Public Library's response to Rural Information Needs (RINs) with special reference to Nagpur Division of MS State | Nagpur University, Nagpur | MS |
| 85 | Punwatkar Sunil D    | Nikose Satyaprakash | Electronic sources of Legal Information: A Study  | Nagpur University, Nagpur | MS |
| 86 | Pradip A. Joshi      | Nikose Satyaprakash | Content Analysis of Biomedical E-Journal "Journal of Post-Graduate Medicine" during 1980-2006                     | Nagpur University, Nagpur | MS |
| 87 | Tamgade Alka B.      | Nikose Satyaprakash | Status of the working women in University Libraries in MS: A Study  | Nagpur University, Nagpur | MS |
| 88 | Khobragade Niraj     | Nikose Satyaprakash | Achievement and Contribution of College Librarians of colleges affiliated to RTM Nagpur University, Nagpur        | Nagpur University, Nagpur | MS |
| 89 | Gajbhiye Chandramani | Nikose Satyaprakash | Citation Analysis of Ph.D. Thesis in Education Submitted to the RTM Nagpur University                             | Nagpur University, Nagpur | MS |
| 90 | Kale Rajesh D        | Satarkar S P        | Development of newspaper libraries in MS  | SRTM University, Nanded   | MS |
| 91 | Puranik Sushma A     | Satarkar S P        | Total quality management in university libraries : Case study of MS   | SRTM University, Nanded   | MS |



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|-----|-------------------|----------------|--|------------------------------|----|
| 92  | Dharmapurikar R G | Satarkar S P   | Study of all India radio libraries   | SRTM University,<br>Nanded   | MS |
| 93  | Hambarde Govind K | Satarkar S P   | Job satisfaction amongst librarians working in engineering institutions in MS state  | SRTM University,<br>Nanded   | MS |
| 94  | Borse Madhukar N  | Satarkar S P   | New technology and innovative measures in library management: A study with special reference to academic librarian in Marathwada | SRTM University,<br>Nanded   | MS |
| 95  | Bhosale Anup B    | Rajyalakshmi D | Application of IT in Agricultural and non-agricultural university libraries in MS  | SGBA University,<br>Amravati | MS |
| 96  | Sarode Ravindra D | Kumar PSG      | Organizational Development of Non-agricultural University Libraries in MS  | SGBA University,<br>Amravati | MS |
| 97  | Wankhade Atul     | Rajyalakshmi D | User Education programme in Indian Libraries   | SGBA University,<br>Amravati | MS |
| 98  | Dhopte S. A.      | Rajyalakshmi D | Content analysis of dissertation of the Amravati University (1993-2003)  | SGBA University,<br>Amravati | MS |
| 99  | Kamble Ajay M     | Kumar PSG      | Centennial Public Libraries in Vidharbha region: A critical study  | SGBA University,<br>Amravati | MS |
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| 101 | Wankhade Atul     | Rajyalakshmi D | Indian Initiative to Bridge Digital Divide   | SGBA University,<br>Amravati | MS |
| 102 | Deshmukh Sonali   | Kherade M R    | Contribution of library professional in MS in the publication of literature on LIS   | SGBA University,<br>Amravati | MS |
| 103 | Kene Neeta        | Kherade M R    | Evaluation of time lag between publication of Information and its use in University libraries in MS                              | SGBA University,<br>Amravati | MS |

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| 105 | Anasane Milind     | Kherade M R    | A study of Engineering College libraries in MS   | SGBA University, Amravati | MS       |
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| 111 | Nishtha Anilkumar  | Rajaram Shyama | Research undertake in physical research laboratory (PRL): A bibliometric study   | M S University, Vadodara  | Guja rat |
| 112 | N. Nageshwaran     | M. B. Konnur   | Resource sharing and networking BITS net Libraries in India  | Tilak MS Vidyapeeth, Pune | MS       |
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| 115 | Rajesh Agavane.  | S. K. Patil.     | Tilak MS Vidyapeeth, Pune. Yethe samajik shastra shikshan kramantargat Arthashastra ani Itihas vidyavachaspati(Ph. D) shikshan kramasathi 2005 parayant sadar kelelya prabandhache ashay vishleshan | Tilak MS Vidyapeeth, Pune | MS |
| 116 | Ramesh Ghatekar  | N. B. Dahibhate. | Citation study of Masters Dissertations in Engineering Submitted to Engineering Colleges in Pune.   | Tilak MS Vidyapeeth, Pune | MS |
| 117 | Sujata Pawar     | M. B. Konnur     | Critical study of LIS Education in Western India  | Tilak MS Vidyapeeth, Pune | MS |
| 118 | Prashant Phugnar | N. B. Dahibhate  | A citation analysis of Doctoral dissertations in LIS accepted by Universities in Western India  | Tilak MS Vidyapeeth, Pune | MS |
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| 136 | Trupti S. Ambre           | B. M. Panage      | MS til 'A' varga Sarvajanik Granthalayacha vikas  | Tilak MS Vidyapeeth, Pune | MS |