

CHAPTER 6

MAJOR FINDINGS, SUGGESTIONS AND CONCLUSION

6.0. INTRODUCTION

Research is the original contribution to the stock of knowledge making for its advancement. It is the study for investigation of truth with the help of observation, comparison and experiment. Advance Learners' English Dictionary of Current English lays down the meaning of research as "a careful investigation or inquiry specially through search for new facts in any branch of knowledge." Qualitative and quantitative researches are the productive techniques for effective diagnosis of problems in any field.

Bibliometrics methods used for the qualitative and quantitative assessment of diversified parameters in the research outputs like journals, books, author's productivity, geographical distribution, etc. of any field. Bibliometric study has contributed the theoretical knowledge and a group of technique and applications based on distribution of bibliography.

The present study attempted to analyse the bibliographic data collected from the doctoral theses submitted in the School of Life Sciences, Assam University, Silchar during the period 1996 to 2012. Bibliometric methods were applied to arrange the citations systematically and analysed to get research pattern in the subject life sciences. The bibliometric methods were used to measure the

implication of research output of life sciences. The main aim of the present study was to investigate the micro literature of life sciences contributed by researchers. This investigation has been attempted to quantify the research growth and development in the subject life sciences.

The present study started with investigating the literature in the field of librametric, bibliometrics, Scientometrics, Citation analysis and their application in different discipline. All the literatures which were consulted for this study were acknowledged with their bibliographical references.

The present study was under taken to identify the characteristics of literature used by the researcher in the field of life sciences. This study is based on the 40 numbers of doctoral theses submitted in the School of Life Sciences, Assam University, Silchar. These 40 doctoral theses contributed total 10012 citations which were analysed by applying the bibliometric method to identify the research trend in the subject life sciences.

6.1. SUMMARY OF MAJOR FINDINGS

The investigated results from the analysis of the different attributes of bibliographical data in the subject life sciences are as follows:

6.1.1. Theses submitted in the School of Life Sciences

It is found that total 40 number of doctoral theses submitted in the School of life science, Assam University, Silchar during the period 1996 to 2012, where 12 theses were submitted in the year 2012 which is the highest, 6 theses were

submitted in the year 2011, 5 theses were submitted in the year 2009 and 2010 each and 1 number of thesis was submitted in the year 2001 which is least.

6.1.2. Number of Citations Per Thesis

Number of citations per thesis varies from 63 to 704. It was found that highest number of citations 704 appended at the end of the 'Thesis No. T04' followed by 504 citations in 'Thesis No. T28' and 63 number of citations was found in 'Thesis No. T15' which is least as compared to others.

6.1.3. Average Number of Citations

There are 40 theses submitted in the School of Life Sciences consisting of total 10012 citations. So, the average number of citations per thesis is approximately 250 citations.

6.1.4. Distribution of Document Form

There are many forms of documents used by the research scholar in the School Life Sciences. All the cited document forms were broadly categorized into 10 forms which were written from highly cited to least cited forms as journals, books, edited books, conference/seminar proceedings, reports, web resources, theses/dissertations, reference books, unpublished documents and miscellaneous.

6.1.5. Ranking of More Cited Document Forms

The distribution pattern of document form shows that the journals are heavily cited source accounting for 80.54% as compared to other document forms and rank first. Books occupy the second position accounting for 9.6% out of total citations. All

other document forms such as conference and seminar proceedings, edited books, web resource, reports etc. all together accounting for 9.86%. The distribution pattern of document citation in the field of life sciences shows that the journals are the most significant category of document form for research scholars in the subject life sciences.

6.1.6. Ranking of Core Journals

The core journal named “Mutation Research” published from Netherland occupies the first rank and “Plant Physiology” published from USA and “Journal of Economic and Taxonomic Botany” published from India hold the second and third rank respectively.

6.1.7. Year-Wise Distribution of Citations Pattern

Period wise distribution of document shows that more numbers of documents highly cited from the recent years and it was also observed that highest numbers of citation came from the decade 1993 to 2002 and after that the trend was decreasing. It is also understood that scholars used journals and books from the recent years.

6.1.8. Authorship Pattern

Authorship pattern is an essential part of study to investigate collaborative participation of the authors. In the present digital era, authors in the life science subject are more involved in team work to solve a research problem. Only 17.94 percent citations of total citations were contributed by single author while 25.94

percent and 56.16 percent were the contributions of citations by two authors and three or more than three authors respectively.

6.1.9. Degree of Collaboration

The degree of collaboration is calculated through application of K. Subramaniam's formula. In the present study, Degree of Collaboration is found maximum from over all data which is 0.82. So, it is inferred that researchers in the field of life sciences take part in collaborative research activity for publishing their publication.

6.1.10. Ranking of Authors

It is observed from the study that the S. K. Jain and C. R. Tarafdar are the highly prolific authors securing first and second rank cited for 55 and 28 times respectively. R. R. Rao is in the third position cited for 25 times.

6.1.11. Ranking of Publisher

Publisher wise distribution of most cited document form was studied. It is revealed from the study that majority of journals published by Elsevier contributing 1128 citation which is highest followed by Springer accounting for 659 numbers of citations. It is observed from the study that majority of books are published by CSIR Publisher accounting for 34 numbers of citations followed by Academic press and Botanical Survey of India contributing 30 numbers of citations by each publisher.

6.1.12. Geographical Distribution of Most Cited Document Form

It is observed from the study that USA ranked top position accounting for 17.09 percent citations followed by Netherland with 13.99 percent and India is in the third position with 11.83 percent of citations. In the present research study, geographical distribution of books also analyzed and found that India is the leading country in publication of books accounting for 38.25 percent citations followed by USA with 25.78 percent and United Kingdom got the third position with 9.36 percent occupying second and third position respectively.

6.1.13. Application of Bradford's Law

By application of Bradfords Law, it is revealed that there are 55(2.18%) journals found in the nucleus and they are most significant journals in the subject life sciences contributing 2697 (33.44%) citations out of total 8064 citations placed in the first zone. In the second zone, there are 321 journals contributing 2688 (33.33%) citations and the third zone consists of 2142 journals accounting for 2679 (33.44%) citations. This analysis clearly indicates that each zone contributes approximately equal percentage of citations i.e. one third of total citations. Hence, with the application of Bradfords Law of Scattering the ratio of each zone is 55: 321: 2142. It was found that there is more concentration of citations contributed by less numbers of journals. So, it can be said that the Bradford's Law of Scattering could be well applied in the study.

6.1.14. Half life and Obsolescence of Literature

All the citations are arranged according to their year of publication starting from the year 2012 to 1813 in descending order. The 50% of citation is 5006 out of total

10012 citations which may be seen near the year 1996. Year of publication not mentioned for 30 number of citation included in the year 1812 to 1993. The cited half life of literature was 17 years from 2012 to 1996 covering approximately 50 percent(51.88 %) of total literature i.e., 5006 citations out of total citations.

The obsolescence study shows that age of publications increases (getting old) and the number of citation decreases. It is identified that the researchers in life sciences prefer to cite current citations

6.1.15. Comparison of Researchers' Preferences Between India with Foreign Journals

Geographical scattering of cited literature used to identify the most productive country in a particular subject. In the present study, journals were studied on the basis of their country of publication. Only 30 numbers of journals contributed 25% of the total journal citations. Table 5.23 shows the name of these 30 journals along with their place of publication and numbers of citations. It is observed that 10 numbers of journals having 679 numbers of journal citations contributed by U.S.A. and rank first, 4 numbers journals with 450 number citations contributed by Netherland rank second, 7 numbers of journals with 446 numbers of citations contributed by India rank third position. New York contributed one journal with 49 numbers of citations which is least.

The country preferences revealed the USA as the most leading country in publication of information sources in Life Sciences and India is also found as third competitive position. The results reveals that researchers prefer to use foreign journals for their research purpose.

From the above discussion on major findings it is concluded that the set objectives for the present study are achieved fruitfully.

6.2. SUGGESTIONS

The present study is helpful and advantageous for School of Life Sciences for carrying out further research activities and library professionals. The following suggestions have been made from the recent research findings:

- i. It is observed from the study of doctoral theses in the field of life sciences that scholars depend mostly on current literature but they also rely upon some amount of old literature. So, it is more important on the part of library professionals that they should acquire current document and there is a need to develop a policy to preserve and maintain relevant old document for their collection development. The obsolete document present in the collection should be weeded out.
- ii. It is observed from the study that the scholars in the field of life sciences depend heavily on the journals published from Netherland followed by USA and India. It is recommended that the scholars should be encouraged to publish the original research work and make India the leading publisher of journals with high impact factor.
- iii. The training program should be organized by the University Library to orient the scholars in the efficient use of different resources present in the library for their research activities.
- iv. More and more research scholars should be attracted to UGC- Infonet and Jgate facilities available through the Central Library, Assam University by

providing proper guidance by library professionals for useful exploitation of electronic resources.

- v. In the age of exponential growth of information literature and budget constraint there is a need to develop an acquisition policy by librarians and information scientist for acquiring need based acquisition of journals, books and other document forms according to the requirement of users. Citation studies help in decision making for procurement of useful reading materials.
- vi. The researchers are needed to be more and more motivated to use Internet to keep themselves abreast with the tremendous research growth in their subject life sciences globally and also to draw the fruitful result from their research work.
- vii. In the present study it is observed that many research scholars in the field of life sciences have not followed available standard citation format. Bibliographic citations were incomplete in some cases. So, the Research Guide should provide awareness towards available standard formats of citations like APA, Chicago, Harvard, MLA etc. to their scholars. While writing their theses the scholar should follow a standard citation format.

6.3. CONTRIBUTION OF THE STUDY

The contributions of the study are as follows:

- i. The implication of the present study will help the librarians in decision making process for core collection development.

- ii. The present study investigated that the journal is the most favoured source of information than other form of documents. So, the libraries should acquire high quality journals to enrich their research outputs of the researchers.
- iii. The collaborative research found to be more significance in the field of life sciences so the researcher must be encouraged to participate in more and more collaborative research activities for the benefit of living creatures including mankind.
- iv. There are many of the funding agencies and industries providing funds to enhance the research activities. Therefore, the researchers must be involved in the individual and collaborative research projects offered by different agencies to enhance and enrich their subject knowledge and supplement the social, economic and academic development of India

6.4. SCOPE OF FURTHER RESEARCH

The present study is based on citations cited in the doctoral theses in the School of Life Sciences, Assam University, Silchar. The bibliometric and scientometric study can also be done in different area such as School of Ecological Sciences, Physical Sciences, Arts and Humanities, etc. in the same university. This type of study can also be carried out in different universities of the North East to bring out fruitful results.

6.5. CONCLUSION

The important elements of a library are information resources, users, staff and equipments. It is out of imagination that a library is having well trained staff but no

information resources. So, library must have information resources in print and electronic form to satisfy the expectation of its users. The innovative advancement in Information Communication Technology (ICT) and publication industry leads excessive growth in the production of research outputs in diversified forms of literature. ICT has emerged as the most vital tool to collect, process, organize and disseminate information to the people on a large scale through communication network. Today, there are large scale productions in research literature in various disciplines which need to be processed, reorganized and transmitted to the users. The aim of libraries and information centres is to provide right information to the right user in right time in right way, so there is a need to process and reorganize the available information to be acquired by the users. The librarians and information professionals need to take proper decision and plan their budget effectively while selecting the information resources as per requirement of the users.

Bibliometrics is most popular and important area in the field of library and information science. Bibliometrics uses statistical and mathematical parameters to assess the scholarly contents present in library and help in collection developments process, budget planning and information retrieval. Bibliometrics studies are needed to identify the pattern of publication, authorship and citation analysis which can give an insight into the dynamics of the area under consideration. Bibliometric methods are most often used in the field of library and information sciences bibliometrics have wide applications in other areas also. The researchers use bibliometric methods to explore the impact of their field of study. Bibliometrics methods are now used in quantitative research assessment exercises of academic outputs which is starting to threaten practice based research. The application of

bibliometric techniques leads to the development tools and techniques for effective and efficient management of library collection economically.

The present study is based on the study of citations cited in the doctoral theses submitted in the School of Life Sciences, Assam University, Silchar. The present objective of the present study was to identify the research trend in the field of Life Sciences. The investigation was undertaken with a view to apply bibliometric methods to identify the core journals, core books, prolific authors, authorship and collaborative pattern, geographical distribution of information sources etc. in the field of Life Science research.

It was identified that journal entitled “Mutation Research” and book entitled “Flora of Assam” were found to be heavily used literature by the scholars of Life Sciences. The author S. K. Jain was found to be the most prolific author. The study reveals that collaborative pattern of research was more than the single authorship pattern. The country preferences revealed the USA as the most leading country in publication of information source in Life Sciences and India is also found as third competitive position.

The findings of this research are fruitful to meet the set objectives of the study. This study will help to examine the growth in research trend in the field of Life Sciences from 1996 to 2012. The results of this study will help the librarian and information professionals to develop a need based acquisition policy for collection development in the library. This type of study may also help in systematic and thorough evaluation of the library collection which in turn helps to identify the strengths and weaknesses of the collections. The collection development policy with a long term plan to build up the collection can be evolved

by redefining the acquisition and weeding out policy of the library if necessary. The inferences also revealed that relevant and useful resources must be acquired, maintained and persevered in the library. The age old obsolete materials should be weeded out to cut down the space problem in the libraries.

In the digital era, all the publications were available in websites as hosted by various research institutions. The recently emerging trend of webometrics may be used to analyse these online information sources to investigate the research trend in different discipline for further research.