CHAPTER- III

METHODOLOGY

3. METHODOLOGY

This chapter discusses the source of data which form the basis for the present investigation and the methodology employed for analysis of the data.

Bibliometrics has evolved from the efforts of early 20\textsuperscript{th} century document list who have applied mathematical and statistical techniques to bibliographical units. It has gained recognition and importance especially during the last three decades and has now become a well-established area of research in the field of information science. The results of Bibliometric studies are increasingly being applied to manage library, more efficiently. The Bibliometrics studies are employed to study the characteristics of subject literature and growth of knowledge of different scientific disciplines to study the communication pattern in different disciplines; to study the communication pattern in different disciplines to aid the process of books and journals acquisition to study the obsolescence of literature; to identify specialties prominent institutions, authors and popular research papers, to aid in the determination of various indicators of development in information use patterns and characteristics of humanist scholar.

Bibliometric methods are used in studies of properties and behavior of recorded knowledge for analyzing the structure of scientific and research area. The evaluation of research activity and administration of information, various statistical methods applied to study for example the pattern of authorship publication and literature use the relationship within scientific domains of English Language and Literature characteristic of humanistic scholars, and research communities and the structure of specific fields in English Language and Literature. The present investigation was carried out to study the characteristics of literature used by the researchers in the field of English Language and Literature. It may be divided into four sub disciplines of English Language and Literature. The study is concerned with the analysis of citations, cited in 97 doctoral theses awarded by the Andhra University during the period from 1953-2006.
The present study, observed the Distribution of theses in English Language and Literature and its sub-disciplines.

Table-3.1

Distribution of the Ph.D Theses Form-wise in English Language and Literature

<table>
<thead>
<tr>
<th>Forms of English Language &amp; Literature</th>
<th>No. of theses</th>
<th>No. of citations</th>
<th>Average No. of citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novels</td>
<td>69</td>
<td>8,608</td>
<td>124.75</td>
</tr>
<tr>
<td>poetry</td>
<td>15</td>
<td>2,426</td>
<td>161.73</td>
</tr>
<tr>
<td>Drama</td>
<td>07</td>
<td>1,076</td>
<td>153.37</td>
</tr>
<tr>
<td>General</td>
<td>06</td>
<td>896</td>
<td>149.33</td>
</tr>
<tr>
<td>Total</td>
<td>97</td>
<td>13,006</td>
<td>134.08</td>
</tr>
</tbody>
</table>

The above table reveals that out of 97 theses relating English Language and Literature its basic sub disciplines occupied the first place with 69 theses in Novel, followed by poetry 15 theses. Drama in third place with 7 Ph.D theses, and the General Subjects occupied the least priority with 6 theses; are treated as comprehensive area, the sub subjects includes philosophy, feminism, curriculum and ideology, etc)

3.1 OBJECTIVES OF THE STUDY:

1. To find out the use patterns of various source of literature, by the researchers in English language and Literature
2. To find out the distribution of citations according to subject, language and country of origin.
3. To study the nature of authorship pattern in English Language and Literature.
4. To identify the core journals as indicated by citation frequencies,
5. To examine the applicability of Bradford’s law of Scattering in the use pattern of journals by the researchers in English Language and Literature.
6. To find out the distribution of cited journals according to the country of origin
7. To study the obsolescence of literature used by the researchers in English Language and Literature.
8. To assess the availability of cited journals and books in the Andhra University, Dr.V.S.Kishna, Library, Visakhapatnam.
9. To study the research, trends and growth of knowledge in the field of English Language and Literature, and
10. To suggest an accurate need based acquisition policy for journal subscription of English Language and Literature Journals according to the findings of the present study.

3.2 NEED FOR THE STUDY:

A literature is a body of thought and expressed in published writings may evolutionary trends have been observed in the publication and use of English Language and Literature. The exponential growth of Literature in Languages, interdisciplinary nature of researchers and origin of new specialization has raised many problems, both in the research and among the library professionals’ also.

Realizing these facts there is a need for the library to adopt some means of tailoring the library collections to the current and potential needs of users. There are two reasons for doing so. Viz. (i) Developing of need oriented collections, on one hand and (ii) utilizing the available budget cost-effectively on library acquisition on the other hand.

To meet these objectives it is necessary for the librarians to know the characteristics of literature being used by the library users especially, by the researchers. Further identification of core journals and books though analysis of citation helps in formulating effective acquisition policy for the library, such a policy is to help in ensuring the optimum utilization of the collection in the library

So far no comprehensive study has been made for identifying core literature which has been made for identifying core literature which is potentially most useful to users in any of the disciplines in Andhra University, Department of English. The present study is a kind of initiative to encourage such efforts in all those disciplines.
of study on which significant portion of the journals budget is being spent, nearly one core rupees spent on every year on acquisition of journals by Dr V.S.Krishna Library Andhra University, Visakhapatnam. The scientific study of potential requirements of researchers in terms of potential requirements of researcher in terms of core literature through citation studies, will ensure standard and needful acquisitions but also optimum use of journal collections by the researchers in the university. Hence with a view to provide some basic information on the characteristics of literature used by the researchers in the English Language and Literature, the present study has been undertaken.

3.3 METHODOLOGY

The analysis has been carried out on the total citations appended to the theses in English Language and Literature as whole, as well as the citations, in the Ph.D theses are also analyzed, and classified into four basic disciplines of English Language and Literature. The comparative analyses of the results and also enables to have better insight of the literature use patterns in different sub disciplines of the English Language and Literature. These methodologies employed for the analyses of citations are described in the following sections.

3.4 COLLECTION AND ANALYSIS OF CITATON DATA

For the purpose of citation analysis the data in the form of references appended in all the 97 theses awarded in English language and literature by Andhra University, Department of English are gathered by the researcher. Each and every reference cited in front notes and at the ends of the chapter and end of the book. Further, database of all the Ph.D theses and citations has been developed covering all the details of citations. Using a computer with M.S. Excel the required tables, calculations and reports are being generated.

Keeping in view all the objectives and hypotheses stated in previous section of this chapter, the analysis of data has been done under two parts:
1. **Part A-** Data analysis of theses

2. **Part B-** Citation analysis on theses

### 3.5 BIBLIOGRAPHIC FORMS OF CITATIONS

The following is the list of bibliographic or types of documents appended to the 97 Ph.D theses covered in the present Bibliometric study. The Bibliometric form of citations is one of the Bibliometric technique which employed for the bibliographic form of citation out of the 97 Ph.D. theses, attributed the following Bibliometric forms.

- Books
- Journals
- Reviews
- Interviews
- Dictionaries & Encyclopedias
- Theses & Dissertations
- Collections
- Biographies
- Radio
- Internet
- Bibliographies
- Reports
- Translations
- C.D’s
- Indexes
- Speeches

The citations have been analyzed according to the bibliographic form, of citations, subject and country of origin. Individual subjects contributing to less than 0.5% of the total citations are grouped into other category. Similarly individual countries contributing to less 0.5% of the total citations are grouped into other category. In this study the simple averages of horizontal and vertical percentages are used to calculate and to identify, and to establish the Bibliometric form of citations.
3.6 MULTIPLE AUTHORSHIP PATTERN

Generally citations have been analyzed to study the nature of single and multiple authorship patterns. To analyze the data was grouped into 5-10 years, as class intervals. With duration of five year's period. The number of authors i.e. single, two, three more than three authors and the total period was calculated. In the analyses, under, the Chapter-IV

3.7 RANKING AND SCATTERING OF CITED JOURNALS

This section discusses the ranking of journals, the productivity of cited journals, the applicability of Broadford’s law of scattering and the scattering of cited journals among different countries.

3.8 RANKED LIST OF CITED JOURNALS

The ranked list of cited journals, are also one of the important aspect in the Bibilometric study. The ranked list one of the important statistical tool in Bibilometric study, to help and guide the librarians and researchers to select the journals of maximum utility in terms of their course in particular subject field. The journals are arranged according to the descending order of citations received by individual journals. That is the journal with the highest number of citations to its credit will occupy the highest rank and other journals are arranged according to the number of citations in descending order.

In this study with regard to the different sub-disciplines, of English Language and Literature, journals citations have been listed with their rank, title, and country of publication, number of citations and percentage of contributions. For English Language and Literature as a whole, Journals contributing not less than 0.25 percent of the total journals citations have been listed and the total number of journal identified was 293.

3.9 PRODUCTIVITY OF JOURNALS:

The present study revealed a grouped the productivity of journals into four Broad areas of viz. (i) Poetry (ii) Drama (iii) Novels (iv) General Subjects .for Bibilometric
study. The productivity of journal was measured by grouping all journals citations into four groups for statistical testing’s. So that each group contained approximately an equal number of citations. The number of journals contributing the related citations in each group was computed, and the average rate of productivity of journals in each group computed by dividing the number of citations in each group by the number of journals in that group.

3.10 APPLICABILITY OF BROADFORD’S LAW OF SCATTERING

The applicability of Bradford’s law of scattering, formulation of the citation data was tested by plotting the cumulative number of citations in the Y-axis, and the logarithm of the cumulative number of journals in the X-axis, where the journals are cumulated in decreasing order of productivity.

The applicability of Bradford’s law of scattering (verbal formulation) to the citation data was tested following the method adopted by Leimkuler (1996)\(^1\) Narayana (1998)\(^2\). The method is described below.

After arranging all the journals in decreasing order of productivity on a specific subject if the journals are grouped into ‘p’ group such that each group contains the same number of citations (Say, yo) then ro, rok, rok2, rok3..........rokp-1would be the number of citations in each group (k 1) denoting NJ as the number of journals in the J the group (J=1.........p) Total number of journals

\[
T = \Sigma (NJ/J=1=ro(1+K+K^2Kp-1)
\]

\[
o= T( k-1)/kp-1
\]  \hspace{1cm} (1)

Where K is called the degree of concentration:

ro = the number of journals in the first group where these journals contain the maximum number of citation.

And total number of citation A= yop ( p is the number of groups)
According to Egghe and Rousseau (1980), the degree of concentration $K$, can be calculated using the formula

$$e^{y \cdot y_m^{1/p}}$$

where $y = 0.5772$ the Euler’s number.

$$= (1.787 \cdot y_m^{1/p})$$

Where $Y_m$ is the number of citations contained in the 1st journal of the 1st group.

Now it is possible to compute the value $K$, the degree of concentration by substituting the value of $y_m$ and $p$ in the equation (2).

By substituting the value of $k$ in equation (1), $r_0$, the number of journals in the first group can be computed.

Using the values of $K$ and $r_0$, it is possible to compute the number of journals in subsequent groups, i.e.

- $r_{0k}$ = the number of journals in the second group,
- $r_{0k2}$ = the number of journals in the third group,
- $r_{0k3}$ = the number of journals in the 4th group, so on.

Based on the number of journals in each group, it is possible to compute from the data, the estimated number of citations in each group. The ratio of the total number of citations to the total number of group given the number of citation that should actually be present in each group. Chi-square (Richard 1986) test of goodness of fit is applied to the number of citations that should be present in each group and the estimated number of citations in each group for different sets of date derived by dividing the total citations into 3, 4, 5, 6, 7, 8, 9, and 10 groups respectively.

### 3.11 Country Wise Distribution of Cited Journals

Citations were analyzed according to the country of publication of cited journals. Individual countries contributing less than 0.5 percent of the total cited journals were grouped in the other category.
3.12 OBsolescence of Literature

The approach to measuring obsolescence used in this investigation is a modified synchronous methodology known as multi-synchronous methodology. Aging or obsolescence of literature may be ascertained through studies of library use or by citation studies. According to Line Sandison (1974) citation studies can be either synchronous or disychnonomous. Both the synchronous and multi- synchronous approaches are based on calculation of citations ages. In the synchronous approach all the source publications will have the same date of publication (year of publications) whereas, in the multi-synchronous approach, the source publications do not share a common publication year. The citation age was calculated by comparing the date of publication of the source publication to the date of publication of a document cited by the author of the source publication. The different in dates is the citation age of the cited document. In the present study the source publication i.e. Ph.D theses did not share a common publication year. In order to calculate the citation age, the publication date of each cited document was compared to the year of submission of the citing theses. The citation ages of all cited documents were then aggregated and tabulated with their frequencies.

Graph where drawn by plotting the values citation ages on the X-axis and cumulative number of citations on the Y-axis to find the half-life (median citation age) for the body of literature as a whole. A line parallel to the X-axis was drawn from a point on the Y-axis, says at P, representing half of the total citations to meet the curve, say at Q. Then a perpendicular to the X-axis was drawn to meet the X-axis at R, R represents the half-life (median citation)

Out of the total of 3,302 citations contain information regarding the year of publication, and these citations were not taken into account in the study of obsolescence of journal literature. Out of total of 8,905 citations of books contain information regarding the of publication, and these citations were taken into account in the study of obsolescence of books.
3.13 AVAILABILITY CITED JOURNALS IN ENGLISH LANGUAGE & LITERATURE

The percentage of availability of cited journals and cited articles in Dr. V.S. Krishna library of Andhra University, Vishakhapatnam was computed for English Language and Literature as a whole and for its sub-disciplines by comparing the journal citation date with the serials Database (published holdings database of the library).

3.14. ASSUMPTIONS

The present study is intended to test the following assumptions enumerated in the previous section.

1. Research in English Language and Literature is highly dependent on books as sources of information.
2. The English Language & Literature is scattered over a wide range of subjects.
3. The total Literature on English Language & Literature in published only English.
4. The English Language & Literature is mainly published by developed countries.
5. The usage pattern of journals by researches in English Language & Literature conforms to the Broad ford’s law of scattering and
6. Researchers in English Language & Literature use current literature in pursing their research.

3.15. LIMITATIONS

The present study has attempted to cover different aspects of literature use pattern by the researchers in English Language and Literature. But due to lack of time and the constraints involved in questioning and interviewing the researchers and research directors, citation behavior pattern of the researchers, could not be undertaken in the present study. Due to irregular and incomplete information especially in terms of name of the authors in cited data a study on Bibliographic coupling could not be included in the present study. Due to lack of time, the sample is limited only to the theses awarded in the Department of English Andhra University. Bibliographic study of the research publications such as journal articles, books, which are be useful for the literature use and research output of the researchers due
to paucity of the time and access with other constrains the study has not covered other sources like research publications.

3.16 CONSPECTUS

CHAPTER-I presents an introduction, covering the concept, importance growth and development of Bibliometric studies. It also explains the relevance and application of the techniques of Bibliometrics in the fields of Library & information science.

CHAPTER- II Deals with the Review of literature on Bibliometrics by both Indian and foreign authors, published in journals English Language and Literature

CHAPTER-III Deals with the scope, purpose objectives and Methodology of the study. It also presents a list of hypotheses which are tested for their validity, using the findings of the statistical data.

CHAPTER- IV Deals with the analysis of the data on various aspects of citations and presented in both tabular and graphical form. The analysis is be presented under two Part-I deals with Bibliographic data analysis, Part-II data with the Citation Analysis and

CHAPTER-V Deals with a summary and discussions of the findings based on the analysis of data. The researcher offered few suggestions at the end to guide the further studies.
REFERENCES


