Chapter 5

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Summary

In all 143 Ph. D. theses from Science and Social Science disciplines were analysed. The highest number of contribution is from Science discipline. From the analysis of citations it was observed that journals are highly cited.

Chemistry

To study the pattern of literature in chemistry in all 7788 citations were analysed drawn from 70 Ph. D. theses submitted and awarded by Sant Gadge Baba Amravati University, Amravati during the period of 1983 - 2002.

The major findings in this discipline are as follows:

There is lack of uniformity among all the theses in the format of citations. No standard format was applied in writing the citations. The average citations per thesis are 111.25.

The major research studies are carried out in Organic Chemistry i.e. 62.85%; it was due to inadequate laboratory facilities in other subjects.

The findings reveals that researchers in chemistry discipline heavily depend on journal sources for their research studies. Journals amount the highest percentage i.e. 70.60 as compared to non-periodical sources. Amongst non-periodical sources books occupy the major portion i.e. 11.87 %.

Journals are the current information carries current research activities are published frequently in journals. Therefore the researchers are more inclined to journals as compared to other sources.

The researchers in chemistry have cited 970 journals for their studies. Out of which 21 are Indian journals. The total journal citations cited are 5496. The Sant Gadge Baba Amravati University, Amravati library subscribe 11 journals. All the 11 journals are Indian journals, out of 11 journals 10 journals have been cited by the research scholars in their research.

The highly cited journal in chemistry is Indian Journal of Chemistry receiving 641 (11.61 %) citations followed by Journal of Acta Ciennica Indica 448 (8.15 %), Journal of Indian Institute of Science 388 (7.05 %). All the three journals are Indian. This reveals that researchers are more inclined to Indian Journals. No foreign journals are subscribed by the library this may be one of the reason for citing Indian
Journals.

Bradford's Law it is found that 4 journals covered 1836 citations. 13 journals covered 1840 citations, 953 journals covered 1820 citations.

It is testified with the journal citations showing the nucleus of zone contain 4 core journals which covered 1/3 of total citations.

The periodwise distribution of citations reveals that researchers go back to forty years and more than forty years for their studies in journals and books. The study reveals that the 26 years old journals covered 2782 citations and the percentage is 50.47%. Hence the half-life period of journal citations is 26 years.

In the book citations 15 years old journals covered 474 (51.09%) citations. Hence the half-life period of book citations is 15 years.

The authorwise analysis of citations of journals reveals that multiple authorship occupy major portion is 76.32% and in books one author occupy major portion that is 46%.

It is concluded that Solo research is dominant in journals due to joint research activities.

Countrywise authorship pattern in journals reveals that contribution of Indian authors is highest i.e. 3034 (55.20%) out of total 5496 citations. In books foreign authors are dominant i.e. 479 (51.72%).

It is concluded that Indian authors articles are frequently cited due to easy availability of journals.

The yearwise distribution of books indicates that books published from 1990-1999 onwards are highly preferred and its percentage is 34.5. This indicates the recency of citations.

The countrywise distribution of citations reveals that India, U.K. and U.S.A. are preferred countries while citing book citations. This is due to major research activities are carried out in these countries.

Ph.D theses from Nagpur university are highly preferred. Nagpur university was the first university for starting Ph.D research programme.
The highest number Bibliographic Coupling found is of Baker W. J. Indian chem soc.

The highest number of citation classics found are 26 for G. S. Manku Inorganic Chemistry, Tata Mc Graw hill New Delhi.
The highest number co-citation found are by V.S. Jamode

Zoology

To study the pattern of literature in zoology in all 7746 citations were analysed drawn from 56 Ph. D. theses submitted and awarded during the period of 1983-2002.

The major findings in this discipline.

A systematic format is followed in each thesis but there is lack of uniformity among all the theses in the format of citations. No standard format was applied in writing the citations.

The average citations per thesis are 138.32. Major studies are carried out in the subject Physiology i.e. 19 (33.92 %).

The findings reveals that researchers in Zoology discipline heavily depend on periodical sources for their studies.

Journals amount the highest percentage i.e. 54.23 % as compared to non-periodical sources. Amongst non-periodical sources books occupy the major portion i.e. 25.95 %.

Current information of research activities is frequently reported in journals and therefore the inclination towards journals is highest.

The researchers in Zoology have cited 1057 journals for their studies. Out of which 35 are Indian journals. The total number of citation pertaining India is 1564 (37.22). The total journal citations cited are 4201. The total number of journals subscribed in the subject by Sant Gadge Baba Amravati University library are 12 journals, out of which 11 journals are found to be cited. The researchers in Zoology have cited not only Zoological journals but also journals of Botany, Microbiology, Geology etc.
It is concluded that most of the research is interdisciplinary.

The highly cited journals in Zoology is Indian Journal of Exp. Biology receiving 541 citations followed by J Expt. Zoology and Indian Jof Zoology. All the 3 journals are Indian this reveals that researchers are more inclined to Indian journals.

Bradford Law it is found that
4 journals covered 1496 citations.
54 journals covered 1400 citations
999 journals cited covered 1305

It is testified with the journals citations showing the nucleus of zone contain 4 core journals which coered 1/3 of total citations.

The periodwise distribution of citation reveals that researchers go back to forty years and more than 40 years for this studies in books as well as journals.

The study reveals that the 22 years old journals covered 2130 citations. Hence the half-life period of journals is 22 years.

In the book citations 16 years old books covered 1026 (50.95 %) citations. Hence the half life period of book citations is 16 years.

Analysis of citations by age of the cited documents indicate the useful life of documents.

The authorwise analysis of citations of journals reveals that multiple authorship occupy major portion that is 42.63 % and in books one author occupy major portion that 51.14 %. This indicates that researchers prefer Solo-research work in journals.

Countrywise authorship pattern in journals reveals that citations of Indian authors is highest i.e. 2354 (56.93 %) out of total 4201 citations. In books also Indian author is highest i.e. 1141 (56.76) out of total 2010 citations.

It is concluded that Indian author articles are frequently cited due to the easy availability of journals and also due to commonness in research fields.

The yearwise distribution of books indicates that books published from 1980-1989 onwards are highly preffered and its percentage is 29.30%
This indicates the recency of citations. The countrywise citations indicates the impact of literature produced in India in the subject, U. K. and U. S. A. are the next preferred countries. This is due to parallel research in these countries.

University wise distribution of citation of Ph. D. theses/dissertation reveals that Ph. D. theses/dissertation from Amravati University is 379, 53.91% out of 703 citations.

The highest number of bibliographic coupling found is 26 by the author S. K. Konar in the Ind Journal Fish Bio.

The highly co-cited author is S. K. Konar.

The study gives a list of 53 highly books which are called as citation classics. The highest citations are received by ecology of pesticides by Braw A. W.

No Self citations were found.

Library and Information Science :-

To study the pattern of literature in all 378 citations were analysed drawn from 5 Ph.D. theses submitted and awarded by Sant Gadge Baba Amravati University, Amravati during the period of 1983 - 2002.

The major findings in this discipline are as follows.

A standard format was applied in writing the citations.

The average citations per thesis is 75.6. There is equal number of research carried in citation analysis, classification, public libraries studies, information use studies and library finance studies.

The findings reveals that researchers in Library and Information science heavily depend on journal sources for their research studies. Journals amount the highest percentage i.e. 65.07% as compared to non-periodical sources. Amongst non-periodical sources books occupy the major portion i.e. 20.37%.

Journals are the primary sources of information and hence are highly preferred.

The researchers have cited 41 journals each receiving three or more
citations. Out of which 37 are Indian journals. The total journal citation cited are 246. The Sant Gadge Baba Amravati University, Amravati subscribe 15 journals out of which 5 are foreign journals. In all 14 journals had been cited by the research scholars in Library and Information Science.

The highly cited journal in Library and Information Science is IASLIC Bulletin receiving 50 citations (20.32%) followed by Annals of Library Science and Documentation 45 (18.29%) and Journal of Documentation 12 (4.87%). Out of these three journals 2 are Indian.

Major research is equally carried out in India and other countries hence journals from India and other countries is prefered.

Bradford Law it is found that
2 Journals covered 95 citations
7 Journals covered 70 citations
32 Journals covered 81 citations

It is testified with the journal citation showing the nucleus of zone contain 2 core journals which covered 1/3 of total citations.

The periodwise distribution of citation reveals that researchers go back to forty years and more than forty years for their studies in journals and books. The study reveals that the 14 years old journals covered 134 citations and the percentage is 54.39%. Hence the half life period of journal citations is 14 years.

In the book citations 11 years old books covered 43 (55.7%) citations. Hence the half life period of book citation is 11 years.

The authorwise analysis of citation of journals reveals that single authorship occupy major portion 50.40% and in books also single authorship is dominant which is 51.94%.

It is concluded that authors prefer writing individually.

Countrywise authorship pattern in journals reveals that citations of Indian authors is highest 157 (63.82%) out of total 378 citations. In books also Indian authors are dominant i.e. 44 (57.14%)
It is concluded that Indian authors articles are frequently cited due to easy availability of journals.

The yearwise distribution of books indicates that books published from 1990 - 1991 onwards are highly preferred and its percentage is 28.57

This indicates recency of citations. The countrywise distribution of citations reveals that India, U.S.A., U.K. are preferred countries while citing book citations.

All the 10 theses cited by the researchers are from Nagpur university.

Not a single bibliographic coupling was found and no co-citation were found.

Due to variation in research no citation classics were found.

**Economics**

To study the pattern of literature in economics in all 1207 citations were analysed drawn from 6 Ph. D. theses submitted and awarded by Sant Gadge Baba Amravati University, Amravati during the period of 1983 - 2002.

The major findings in this disciplines are as follows.

The citations are quoted separately, ex. Books, journals, reports etc.

But there is lack of uniformity among all the theses in the format of citations. No standard format is followed.

Subjectwise classification reveals that the major research studies are carried in economics.

The findings reveals that researchers in Economics discipline heavily depend on non-periodical sources for their studies. Books amount the highest percentage i.e. 60.06 % as compared to journal citations. Journals amount to only 18.47 % of all the 1207 citations.

Books are major sources of information in social science due to theory based research.

The researchers in Economics have cited 20 journals for their studies. The
total journal citations are 223. The Sant Gadgebaba Amravati University, Amravati library does subscribe 6 journals specially of the subject. All 20 journals cited are Indian which have been cited by the research scholars.

In all 71 interdisciplinary journals are subscribed S.G.BAmravati University Library. The journals cited by the researchers are available in the library and are Indian journals.

The highly cited journals in economics is Economic and Political weekly receiving 38 (17.04%) citations followed by Arthasanwad 35 (15.69%), University News 16 (7.17%) and all the three journals are Indian. This reveals that researchers are more inclined to Indian journals.

Bradford law it is found that
2 journals covered 73 citations
7 journals covered 82 citations
11 journals covered 68 citations

It is testified with the journal citation showing the nucleus of zone contain 2 core journals which covered 1/3 of the total citations

The present study reveals that researchers go back to forty years for their studies in books and journals. The study reveals that the 15 years old journals covered 119 citations and the percentage is 53.28%. Hence the half life period of journal citations is 15 years.

In the book citations 20 years old books covered 375 (51.63%) citations. Hence the half life period of book citations is 20.

The authorwise analysis of citation of journals reveals that single authorship occupy major portion that is 56.50%, and in books also single author occupy major portion that is 52.96%.

It is concluded that single authorship is dominant in journals and books due to individual research.

Countrywise authorship pattern in books reveals that citations by Foreign authors is highest i.e. 68.41 out of total citations.

In journal citations no foreign author citations were found.
The yearwise distribution of books indicates that books published from 1970-1979 are highly preferred and its percentage is 26.06.

The countrywise distribution of citations reveals that books published in India, UK, USA are preferred.

In all 76 Ph.D theses were cited and all the theses are from Nagpur university.
The book which is called Citation Classics is Research Methodology by Kothari, C.R.

The highly cited newspaper is Lokmat, Nagpur.

History

To study the pattern of literature in all 1478 citations were analysed drawn from 6 Ph. D. theses submitted and awarded during the period of 1983-2002.

The major findings in this discipline are as follows.
There is no uniformity among all the theses in the format of citations.
The average citations per theses are 246

The major research studies are carried out in history related to Maharashtra state will special reference to Amravati.

The findings reveals that researchers in history discipline havity depend on non-periodical sources of information. Books account for 48.17 % of all the citations, where as no periodical citations were found. Other sources include reports, government publications, news papers and reference books.

News papers are invaluable sources in history and as such as a list of 9 news papers has been presented in the order of their frequency of citations received. The highly cited news papers is Daily Lokmat, Amravati.

The periodwise distribution of citation in books reveals that historians in Sant Gadge Baba Amravati University, Amravati go back 40 years for their studies in books. The half life period of books is 27 years i.e. 51.68 %.

Single authorship is highly preferred in history.

The literature published in Maharashtra is highly preferred its percentage is 68.9.
The yearwise distribution of books indicates that books published during 1930-1939 are highly preferred. The book which is called Citation Classics is Parasnath D. B.

Testing of Hypothesis

1] The journal articles are most favoured category of document source of the researchers in the faculty of Science than in the Social Science
Statement: The hypotheses is validate in Chemistry, Zoology and LIS.

2 Indian journals are most frequently referred by researchers in both the discipline.
Statement: The hypotheses is validate

3 Indian authors are most frequently referred by researchers in both the discipline.
Statement: The hypotheses is validate

4 Indian sources are highly referred by researchers than international sources
Statement: The hypotheses is validate.

Conclusion

The present study was initiated with the main objectives of examining the research work done on various aspects of science and social science discipline and to reveal the information seeking pattern of the scientist working science and social science.

The investigation revealed many characteristics features of the research in this field indentifying the strength and weakness of the research process over the period and how the information is used by their respective scientists. This study revealed many characteristics features of the research in the field, which may be considered to represent the research scene in S. G. B. Amravati University. The major findings are as follows:

1. Citation practice of Authors

There is no uniform practice in the matter of citation of earlier works among the researchers of science and social science disciplines.
2. **Subject - Analysis**

Subject analysis study of theses showed that, they deal with the following aspects.

**Chemistry -**
- Major studies are carried out in organic chemistry.

**Zoology -**
- Major studies are carried out in Physiology.

**Library and Information Science -**
- Equal number of research are carried in citation analysis, classification, public libraries and information use.

**Economics -**
- Major studies are carried out in economics other than production, co-operations etc.

**History -**
- Major studies are carried out on history of Amravati region.

**Types of Documents**

Researchers made use of periodicals to a considerable extent for their information requirements except in the subject history.

In Chemistry, Zoology and Library and Information Science journals were highly preferred. In the subject economics books as information sources were highly preferred. In history books, government publications, reports and newspapers were highly preferred.

The most frequented by cited journals are Indian journals.

**Ranking of Periodicals**

The ranked list of journals prepared from the journals citations in chemistry revealed that Indian J. of Chemistry ranked first. In Zoology Indian J. of Expt. Biology
ranked first in Library and Information Science IASLIC Bulletin ranked highest in Economics, Economic & Political ranked highest. No journal citation were found in history.

All the journals are found in History. The reasons may be easy availability of Indian journals.

Bradford's Law -

Scattering of science periodicals following Bradford's Law of scattering in all 4 subjects studied. Core journals those which are in the nucleus of each of the above subjects were found out. Among these 4 subjects highest number of journals in the nucleus is 4 and chemistry and zoology had 4 core journals each. In Library & Information Science and Economics 2 core journals were found in the nucleus.

Age of Cited Journals and Books -

The cited journals were further examined to determine their recency. The time span between the publications of a document and its use has been examined. The analysis indicates the current materials were important because the authors usually discuss topics of current utility and interest. As the time span increase most of the materials get obsolete.

In Chemistry 26 years old journals covered 2782 citations and the percentage is 50.47. In books citations 15 years old books covered 474 citations and the journals is 51.09 %.

In Zoology 22 years old journals covered 2130 citations and the percentage is 50.59 In books citations 16 years old books covered 1026 citations and its percentage is 50.95 %.

In library and Information Science 14 years old journals covered 134 citations and the percentage is 54.98 . In books citations 11 years old books covered 43 citations and its percentage is 55.85.

In Economics 15 years old journals covered 119 citations and the percentage is 53.28. In book citations 20 years old books covered 393 citations and its per-
percentage is 51.72.

In History 27 years old books covered 368 citations and its percentage is 51.68.

**Authorship Pattern:**

Solo research is highly preferred in journals in Chemistry & Zoology. In Library & Information Science and Economics single authorship is highly preferred.

In book citations single authorship is dominant in Chemistry, Zoology, Library and Information Science, Economics and History.

Countrywise authorship reveals that citations of Indian authors is highly preferred in Chemistry, Zoology, Library & Information Science in journals. In Economics no foreign journal was cited.

Countrywise authorship pattern in books reveals that foreign authors were preferred in Chemistry and Economics only. In History books from Maharashtra region were highly preferred.

**Yearwise Distribution**

In Chemistry the yearwise distribution reveals that 320 citations fall in the decade 1990 - 1999 and the percentage is 34.55.

In Zoology the highest number of citation fall in the decade 1980 - 1989 i.e. 589 (29.30 %).

In Library and Information Science the highest number of citation fall in the decade 1990 - 1999, 22 citations and the percentage is 28.57.

In Economics yearwise distribution reveals that 189 citations fall in the decade 1970 - 1979 and the percentage is 26.06.

In History yearwise distribution reveals that 247 citations fall in the decade 1930 - 1939 and the percentage is 34.69.

It is concluded that recent citations are referred by researchers in Science and Library Science while older citations are cited by researchers Economics and History.
Geographical Distribution of Citations:

Geographical analysis of the journal citations showed that India, U.K. and U.S.A. are preferred countries in Chemistry, Zoology, Library and Information Science and Economics.

In history book citations from Maharashtra are highly preferred.

University distribution of Ph.D. theses / dissertations:

Ph.D. theses / dissertation from Nagpur University were highly preferred in Chemistry. In Zoology, theses from Amravati University were highly preferred.

In Library & Information Science theses from Nagpur University are preferred.

In Economics, theses from Nagpur University were highly preferred.

In History, no thesis citations were found.

Suggestions

The researchers should follow a standard format for writing citations.

The researchers should be informed about the standards and other relevant information.

The present age is Information Technology age. Hence most of the information is available on internet. But no web citations were found.

Therefore, periodical orientation programme should be organised for research scholars to acquaint them with advanced information available on internet.

A library news letter / Bulletin should be published monthly / quarterly to inform the research scholars about facilities available for them in library.

Computer facilities should be provided for analysis and calculation of data to be incorporated in their thesis at minimum cost.

An independent research unit should be setup providing information services through internet, C.D. databases and other information centers. A
professional skilled in retrieving information from print and non-print sources should be appointed.

More library facilities should be extended and residential accommodation should be provided to such research scholars who have taken up the time bound research projects.

Research trends in Science and Social Science discipline

From the point of view of the library and information centres it is essential to evaluate and study the research trends from time so that it would be quite easy for designing, organising and managing the various information services and products to catch the information needs of researchers effectively, expeditiously and exhaustively.

The analytical study citations of Ph. D. theses reveals many findings carrying wide implications to the research policy and the collection development. These findings have thrown much light on the variety of information sources on which the scientists depends on.

Research trends arrived out of the present study are stated below.

1] Research conducted is limited and pertain where research facilities are available.

2] Journals form the chief source of information to the researchers of Chemistry, Zoology and Library & Information Science. This trend continues from past as journal sources are highly useful.

3] In recent period there is a shift from solo research to collaborative research pure sciences and in some subjects of social science.

4] Indian books and Indian journals are highly prefered.

5] The yearwise distribution of citation reveals that book citation from 80's onwards is highly prefered in Chemistry, Zoology, Library and Information Science and in Economics and history old citations are highly prefered. The trend is of recent citations. In History older citations from 1939 are prefered.

[224]
6] No web citations were found though there is enormous development in open access archives and online free electronic journals. This reveals the traditional trend preferred by the researchers.

**Areas for further research**

1. Web citation patterns by research scholars of S. G. B. Amravati University.
2. Citation cycle (in a discipline).
3. Biobibliometric studies.
4. Scientometric studies of a discipline.
5. Informetric studies.
6. Webometric studies of prominent journals available on web.