

Citation Analysis of Ph.D Theses

A study of doctoral theses submitted to Kashmir University during 1980-2000 in Natural Sciences

S.M.Shafi* and Wahida Gazi**

*Reader, Department of I & Sc . University of Kashmir

E-mail:shafi_sm @rediffmail.com

** Project fellow. Department of L & ISC. University of Kashmir

Abstract

Reports a study of one hundred doctoral dissertations submitted to Kashmir University during the period 1980-2000 in the field of Natural sciences. A total of 11,862 citations were analysed for identifying bibliographic form, citation potential, journal ranking and obscelecnce rate.

Keywords: *citation analysis; half life; ranking of journals; citation potential and Bibliographic form*

1. Introduction

While preparing a research paper, review or thesis/dissertation an investigator or a scholar necessarily refers to earlier works which are related to his field. This practice is well established in scientific literature even about three centuries ago when early periodicals started. The lowly footnotes, as the present form of footnotes were originally called attained a position of considerable importance in scientific documentation. The earliest name of the foot name according to Derek de sola price was "sholia" which means "relating to scholarship".⁽¹⁾ This indicates that practice of footnoting was considered to be the scholarly practice. The present investigators have chosen PhD theses in the field of Natural sciences submitted to University of Kashmir during 1980-2000 A. D. for analyzing the citations in order to understand the nature of documents used by scholars, subject distribution, ranking, half life of journal Literature used etc

2. Objectives

The following objectives were set for carrying out the study:

a) To understand the citation potential of the

- theses and distribution of various sources
- b) To understand the use of primary sources and establish a ranked list of journals
 - c) To find out the obsolescence of the literature used by the scholars.

3. Material and Methods

One hundred PhD theses available in the university (1988-2000) on Natural Sciences were taken from the shelves and citation pages were copied. The data was transferred on cards according to the required parameters guided by the objectives of the investigation .The data was classified, tabulated, presented, analyzed and interpreted with the help of tables and figures.

4. Discussion and Results

4.1. Discipline wise Distribution

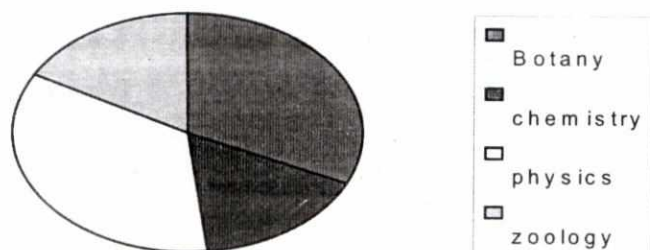
The study reveals that out of 100 theses, the maximum number of theses (35%) pertain to physics followed by Botany (32%). The minimum number of theses (17%) relate to Zoology. Subject areas are shown in Table 1and also represented by a pie diagram (diagram. 1)

Table 1. No of theses analysed

S. No	Subject	No of theses	Cumulative no
1	Botany	32(32)	-
2	Chemistry	16(16)	48(48)
3	Physics	35(35)	83(83)
4	Zoology	17(17)	100(100)

* Figures In parenthesis indicate percentage.

Diagram 1: Distribution of theses analysed (Subject wise)



4.2. Bibliographic form

Journals are most used bibliographic form accounting for 8,076 citations (68.08%) out of total number of 11,862 citations. The total number of seminar papers cumulate to 1,038 citations (8.750%). The book citations are the least forming 01.47 % while other bibliographic forms like patents, specifications etc record a good percentage of about 9% (table 2). The distribution of bibliographic form, subject wise, (table 3) reveals that Chemistry constitute a highest percentage of journal citations (78%), followed by Physics and Botany. Again physics report a highest percentage of thesis literature (10.97) followed by Zoology and Botany when Chemistry show less use of seminar papers in their theses (01.74%). Chemistry and Botany have about 1345 citations of books in their theses when it is low in other fields. The use of doctoral dissertations is least in all the fields. Its cumulative citation percentage does not exceed to 01.68.

Table 2. Bibliographic form (Natural sciences) during the period

S. No	Source	Total # of citations	Cumulative number
1.	Journal publications	8,076 (68.08)	-
2.	Seminar papers	1,038 (08.75)	9,114(76.83)
3.	Books	0,199(01.68)	10,577(89.17)
4.	Theses	0,174(01.47)	10,751(90.64)
5.	Others	1,111(09.36)	11,862(100.00)

*Figures in parenthesis indicate percentage

Table 3. Bibliographic form in Natural sciences (discipline wise)

S.No Disciplines	Journal	Bibliographic form				others	total
		seminar	books	R. Book	thesis		
1. Botany	2,916 (63.65)	362 (07.09)	606 (13.24)	153 (03.34)	077 (1.68)	467 (10.19)	4,581 (100)
2. Chemistry	721 (78.28)	016 (01.74)	123 (13.35)	010 (01.09)	009 (00.96)	042 (04.56)	0,881 (100)
3. Physics	2,445 (68.95)	389 (10.97)	364 (10.27)	014 (00.39)	034 (00.96)	300 (08.46)	3,564 (100)
4. Zoology	1,994 (70.86)	271 (09.63)	171 (06.08)	22 (00.78)	54 (01.92)	302 (10.73)	2,414 (100)

*Figures in parenthesis indicate percentage

4.3 Citation potential

It is clear from table 4 that out of 100 theses, the highest number of citations i.e 450 are only in one thesis when minimum citations range from 1-50 in 15 theses. A large number of theses (32%) contain citations from 51-100 followed by 255 having citations ranging from 101-150. It is also clear from table 5 that theses submitted in the field of chemistry have less number of citations not exceeding 150 in any case. The highest number of theses in the field of Botany (one third of theses submitted) contain 151-200 citations, followed by Physics where 50 % theses submitted possess citations from 51-100. This shows a variation in citation potential of Natural sciences and also among various sub- fields of Natural Sciences.

Table 4. Frequency distribution of citation potential

No of citations	No of theses
0-50	15
51-100	32
101-150	25
151-200	15
201-50	09
250-300	03
301-350	-
351-400	-
401-450	01

Table 5. Frequency distribution of citation potential (discipline wise)

No of citations	No of theses			
	Botany N=32	Chemistry N=16	Physics N=35	Zoology N=17
0- 50	-	06	09	-
51- 100	07	08	16	01
101- 150	11	02	04	08
151- 200	11	-	02	02
201 -250	02	-	03	04
251- 300	01	-	-	02
301 -350	-	-	-	-
351- 400	-	-	-	-
401- 450	-	-	01	--

4.4 Ranking of journals

The following tables (tables 6-9) show most cited journals in the field of Natural Sciences. A few journals are cited equally by both Botany and Zoology scholars. The core journals are limited to 10 highly cited journals which may form a base for librarians, teachers and scholars in selecting useful journals in their respective subject areas.

Table 6 . Ranked list of physics Journals

Rank	Name of the journal	Total citations
1	Physics Review	229
2	Applied journal of physics	147
3	Physics review letters	126
4	Nature	121
5	Solar Physics	107
6	Astrophysics	80
7	Journal of chemical physics	62
8	Physics letters	58
9	Journal of Applied Physics	42
10	Journal of physics	39

Table 7. Ranked list of Botany journals

Rank	Name of the journal	Total citations
1	Indian journal of Botanical sciences	99
2	Hydrobiologia	87
3	Taxon	79
4	Indian journal of Genetics	62
5	American Journal of Botany	51
6	Canadian journal of Botany	51
7	Ecology	48
8	Journal of Ecology	47
9	Plant physics	47
10	plant dis .ret	44

Table 8. Ranked List of Zoology Journals

Rank	Name of the journal	Total citations
1	Hydrobiologia	92
2	Indian journal of Helminthology	56
3	Journal economic entomology	53
4	Nematologia	46
5	Journal res .bd. Canada	39
6	Hydrobiology	36
7	Canadian journal of Zoology	33
8	Limn logical Oceanographer	33
9	Indian journal of entomology	32
10	Oriental Insects	26

Table 9. Ranked list of Chemistry Journals

Rank	Name of the journal	Total citations
1	chemical Abstracts	89
2	photochemistry	60
3	journal of Physical chemistry	47
4	Journal of American chemical society	43
5	journal of inorganic chemistry	25
6	Indian journal of chemistry	24
7	Journal of chemical physics	22
8	journal of physical colloid interface Sc.	20
9	Inorganic Chemical Acta	19
10	Journal of inorganic Nuclear Chemistry	18

4.5. Obsolescence of literature and half life of journal citations

The analysis of citations by age of cited documents reveal useful life of documents. This period of citations of the journal articles popularly referred as "half Life Of periodicals" or often quoted as "Obsolescence of use of Literature". A chronological distribution of journal citations is given in Table 10. A graph has been plotted based on data of chronological distribution given in the table 10 of periodical citations. Taking the period of years at the interval of five years on X-axis and cumulative number of citations on Y axis. Parallel line from Y axis is drawn from "P" (representing the half the no of total citations) to meet the curve at Q. A perpendicular QR is drawn on X axis. The line "OP" represents the half of the total (4038) citation i.e. Q and the line " QR" represents the half life. The half life period of the journal citations for the present analysis drawn is 37 years.

Table 10. Chronological order of citations

Period of citation	No of Citations	Cumulative citations
1941& Before	100	—
1942-46	421	521
1947-51	622	1143
1952-56	744	1887
1957-61	804	2691
1962-66	605	3296
1967-71	476	3772
1972-76	996	4768
1977-81	752	5520
1982-86	851	6371
1987-91	855	7226
1992-96	764	7990
Unidentified	086	8076

5. Conclusion

The following conclusions are drawn by analyzing about 8,000 citations derived from 100 doctoral theses.

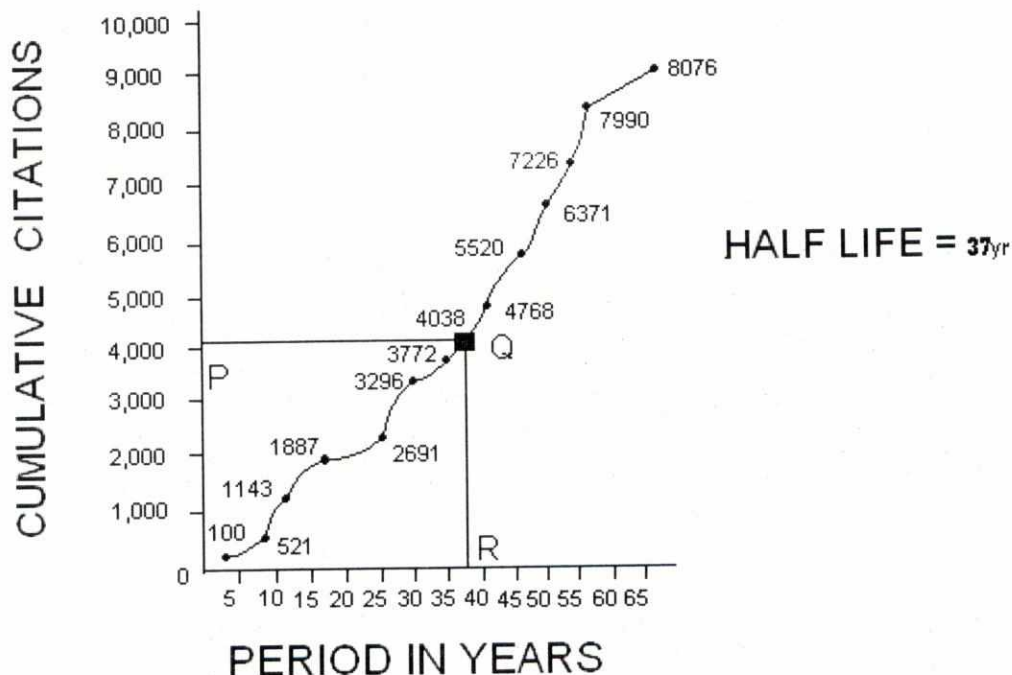
a. The researchers don't not follow standard format for recording the bibliographic details and few citations don't include full

bibliographical descriptions for proper identification of the sources cited.

- b. The number of citations given in support of literature review is not adequate which does not exceed 50-100 citations in 32 %theses. The field of Chemistry report very less number of citations and hasn't exceeded 150 inclusive of sources repeated more than twice.
- c. The highest citations are from journals followed by seminar proceedings which are in accordance with international and national practices in Natural sciences.
- d. The half life of journal citations is 37 years. It shows non use of adequate literature in the respective fields. The maximum number of journal use pertain to 1982-91 and 1972-76 which is, on the other hand, significant indicator for the use of recent journals subscribed by the institutions.
- e. Hydrobiologia is highly ranked journal of Biology scholars published abroad when Indian journal of Botanical sciences and Indian Journal of Helminthology is highly cited journal of the country. Physics Review and Photochemistry are referred largely by

Fig 1.

HALF LIFE PERIOD OF CITATIONS



Physicists and chemistry scholars It is interesting to record that Chemical Abstracts is highly cited and it seems that scholars depend on abstracting service heavily either due to non-availability of primary literature in academic and research institutions etc or high quality abstracts which are adequate that

one does not require any further reference to the original source.

6. Reference

1. Barr, Larry Leo (1966). The origin of Footnotes. *RQ* V5 (3):1966. pp 16-17.