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## Citation Analysis of Doctoral Theses in Science and Social Sciences Submitted to ICFAI University, Dehradunduring 2012 – 2020.

TAPAS ROY

tapasroy135013@gmail.com

ROUNAK BISWAS

rounak.biswas124@gmail.com

Samaresh Modak

samreshmodak.2012@gmail.com

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**Citation Analysis of Doctoral Theses in Science and Social Sciences Submitted to ICFAI University, Dehradunduring 2012 – 2020.**

**Rounak Biswas**

[rounakbsws@gmail.com](mailto:rounakbsws@gmail.com)

**Tapas Roy**

[tapasroy135013@gmail.com](mailto:tapasroy135013@gmail.com)

**Samaresh Modak**

[Samareshmodak.2012@gmail.com](mailto:Samareshmodak.2012@gmail.com)

**Abstract:**

The study is based on the citation analysis of doctoral theses submitted to ICFAI University, Dehradun which was established under ICFAI University Act 2003. The main objective of this study is to determine the use of information sources by the research scholars of the University for completing their doctoral theses. There are a total of 23 numbers of doctoral theses awarded from the year 2012 to 2020. Among those theses thirteen theses are from social science departments and remaining ten theses belong to science departments. The study is conducted on the 8979 citations appended in these theses. Bibliographical entries illustrated at the end of the theses were collected and analyzed on several parameters like bibliographic form, authorship pattern, geographic distribution of citations, scattering of Indian and foreign author's citations and chronological distribution of citations. The image that will come out from this study would serve as a user study of library users hence it helps the librarians to enrich library collection as per the needs of the user demand for the learning resources and in designing of user services in libraries.

**Keywords:** Citation Analysis, Citation Study, Doctoral Theses, Authorship Pattern, ICFAI University

## **Introduction:**

Citation analysis is a bibliometrics study which assesses how often a published work is cited. Citation analysis is a mathematical tool to ascertain the core references in a subject through counting the citations appended at the end of each scientific research. Citation analysis is one of the methods for examining the sources of information used by the researchers for their work. Citation analysis is a helpful method for understanding authorship pattern, publication trends, impact, subject relationship etc. and it also bring out many useful information like related use of various kind of documents such as books, journal, reports, e-resource, doctoral thesis, conference, patents, standards etc which can be better used for bibliometric studies in many respects.

Citation analysis helps to analyze the library resources to determine the actual use of the documents. Citation analysis can help libraries and information system designers to provide useful ideas for acquisition of important documents etc. to plan their products and services. Citation analysis uses bibliographic references and it helps to identify about the materials which are related to a particular topic and is worth reading.

## **Review of Literature:**

Banateppanvar, K, Biradar, B.S and Kannappanavar, B.U (2013) examined the theses submitted on botany to the kuvempur University from 2000 to 2006. Authors found that the researchers in the field of botany preferred the journals most as a source of information. Authors also found that major citations used by the researchers come from journal literature, accounting for 74.77% citations. Most of the citations in the authorship pattern for journal citations were contributed by multi authors. Bauer, K and Bakkalasi, N (2005) prove that citation analysis is a tool for tracing scholarly, justify authority, measures impact and finding decisions. It empowers research to follow the development and impact of an article by looking backward at the references and forward to those authors whose articles are cited. Zafrunnisha, N (2012) examined 9,162 citations appended within the 77 doctoral theses of sociology and found that sociology researchers referred mostly to book sources instead of other sources. Most of the publications cited by the sociology researchers were published by developed countries and all the citations were published in English language. Deshmukh, P.P. (2011) conducted a study of citation analysis of doctoral theses submitted during 1990-94 to PunjabraoKrishiVidyaPeeth. The total number of these is 89 and total 11698

citations are analysed to find the format of citations, authorship Pattern, core journals, geographical distribution of publications, and age wise distribution of citations. The study also extended to check the availability of cited resources in those doctoral theses. Gooden,A.M (2001) analysed the PhD dissertations of chemistry departments of Ohio State University between 1996 to 2000 and found that only 12 journals are necessary to cover fifty percent of the references and demonstrates that most of the citations correspond to articles published in scientific journals.

### **Objectives of the Study:**

The main objectives of this study are as follows:-

- 1)To ascertain the use of different types of documents used by researchers like books,journals,periodicals, conference proceedings,reports,online resources etc.
- 2) To determine the authorship pattern of citations used by researchers.
- 3)To know the time period of documents used in the research work by the researchers.
- 4)To investigate the place of publication of literature among different geographical areas.
- 5)To know the number of citations received by the Indian author than foreign authors.
- 6) To bring out the number of citations of web citations and printed citations.

### **Scope and Limitation:**

The current study is a citation analysis of doctoral theses submitted to

ICFAI University ,situated at Dehradun,Uttarakhand in the duration from 2012 to 2020. The number of doctoral theses submitted to the various sciences and social science departments of the university are 23 and a total number of 8979 citations have been discussed here.Among thatthirteen theses are from social science departments and remaining ten theses belong to science departments.All the citations are examined to check bibliographic form, authorship pattern, publisher name, geographical distribution of citations connected on those theses submitted to ICFAI University,Deharadun, Uttarakhand.

## Methodology:

Citation counting is the chosen methodology for the study. Each thesis submitted to the university by its subordinate science and social science departments are approached physically. The data was collected from the bibliographic references listed at the end of each chapter and end of the doctoral theses, which are used by the researchers for completing their theses. All bibliographic references were photocopied and data was collected and at last the analysis was made with the help of various parameters.

## Results and Data Analysis:

### From wise distribution of citations:

Table-1 shows the distribution of citations among the different forms of literature used by the researchers in their doctoral theses. Analysis of data reveal that the highest number of citations from journal articles (53.56%), followed by 38.69% books, 2.14% reports, 0.8% Govt. Publications, 1.54% thesis, 0.67% newspaper, 1.17% websites, 0.8% gazetteers and 0.63% 'others' type of documents. Here the examples of 'others' documents are database, patents, survey, personal communication, unpublished materials, manuals, research bulletin etc.

Types of literature	No. of citations (%)		
	Social Science	Science	Total
Books	3219(51.22%)	255(9.47%)	3474(38.69%)
Journal Articles	2532(40.29%)	2277(84.52%)	4809(53.56%)
Reports	147(2.34%)	45(1.67%)	192(2.14%)
Govt. Publications	51(.81%)	21(.78%)	72(.8%)
Theses	105(1.67%)	36(1.34%)	141(1.54%)
News Papers	30(.48%)	27(1%)	57(.67%)

Websites	93(1.48%)	12(.45%)	105(1.17%)
Gazetteers	69(1.1%)	3(.11%)	72(.8%)
Others	39(.62%)	18(.67%)	57(.63%)
<b>Total</b>	6285(100%)	2694(100%)	8979(100%)

**Table-1: Form Wise Distribution of Citations**

Hence, the study reveals that most of the science researchers prefer journal articles and social science researchers or authors depend upon the book literature for their research work.

### **Authorship pattern study of citations:**

The study of authorship pattern is a significant factor in study of citation analysis. Normally authorship of a document or paper has become an important consideration for researchers and scientists. The percentage of authors in one, two, three, four, and five and in multiple has been analysed and shown in table-2. Some of the documents like newspaper, interviews that have not any author aren't categorised in the following table. The data found from the table revealed that single authored documents accounting for 41.16% of the total citations and rest all are multiple authored.

<b>Authors</b>	<b>No. of Citations (%)</b>		
	<b>Social Science</b>	<b>Science</b>	<b>Total</b>
One Author	3039(48.35%)	657(24.39%)	3696(41.16%)
Two Authors	1449(23.05%)	816(30.29%)	2265(25.23%)
Three Authors	792(12.7%)	546(20.27%)	1338(14.9%)
Four Authors	459(7.3%)	285(10.58%)	744(8.29%)
Five Authors	195(3.1%)	147(5.46%)	342(3.81%)

Multiple Authors	294(4.68%)	207(7.68%)	501(5.58%)
Not Given	57(.91%)	36(1.34%)	93(1.04%)
<b>Total</b>	6285(100%)	2694(100%)	8979(100%)

**Table-2: Authorship Pattern**

Authorship Patterns in science subjects reveal that the percentage of multiple authorship is higher than single authorship publications. These points out a tendency towards collaborative research in the field of science subjects.

**Comparative study between Indian and foreign author citations:**

To determine the number of Indian and foreign author citations, the name of the author has been used here. The following distribution has been created by determining the number of Indian and foreign author citations. The study reveals that 59.65% citations are from foreign authors, whereas Indian authors receive 40.35% citations out of total Indian and foreign author citations.

Type of author citations	No. of Citations (%)		
	Social Science	Science	Total
Indian author	2772(40.37%)	645(40.26%)	3417(40.35%)
Foreign author	4095(59.63%)	957(59.74%)	5052(59.65%)
Total	6867(100%)	1602(100%)	8469(100%)

**Table-3: Comparative study between Indian and foreign author citations**

Therefore, it can be concluded that researchers depend heavily on the writings of foreign authors.

**Age-wise Distribution of Citations:**

The age wise distribution of citations of different forms of literature cited in the theses was shown in table-4. The citations here are divided into 11 different periodical groups having periodicity of ten year each. From the table,It can be observed that the highest number of citations (29.87%) were from the literature published during the period of 2001-2010 and lowest percentage of cited literature (1.27%) come from the period of 1931-1940.

<b>Time Period</b>	<b>No. of Citations (%)</b>		
	<b>Social Science</b>	<b>Science</b>	<b>Total</b>
2011-2020	1074(17.09%)	753(27.95%)	1827(20.35%)
2001-2010	1758(27.97%)	924(34.30%)	2682(29.87%)
1991-2000	1293(20.57%)	492(18.26%)	1785(19.87%)
1981-1990	552(8.78%)	141(5.23%)	693(7.72%)
1971-1980	402(6.4%)	114(4.23%)	516(5.75%)
1961-1970	558(8.88%)	87(3.22%)	645(7.18%)
1951-1960	144(2.29%)	39(1.45%)	183(2.04%)
1941-1950	231(3.67%)	33(1.22%)	264(2.94%)
1931-1940	84(1.34%)	30(1.11%)	114(1.27%)
1921-1930	93(1.48%)	27(1.00%)	120(1.34%)
Prior to 1921	72(1.15%)	45(1.67%)	117(1.3%)
Not Found	24(0.38%)	9(0.33%)	33(0.37%)
<b>Total</b>	6285(100%)	2694(100%)	8979(100%)

**Table-4: Age Wise Distribution of Citations**



### Geographical Distribution of Citations:

The geographical distribution of citations is calculated to understand which country is productive in the particular subject area. It has been noticed during the present study that in case of some citations, the country of publication is not mentioned. Analysis of data of 8979 citations which were scattered in publications from more than 20 countries are shown in the following table. Table-5 indicated that science researchers mostly cited the documents published from USA (36.53%) followed by the publications from UK (21.49%) and India (14.48%), whereas social science researchers prefer the publications from India (81.19%) compared to other countries.

Place of Publication	No of citations (%)		
	Social Science	Science	Total
India	5103(81.19%)	390(14.48%)	5493(61.18%)
USA	414(6.59%)	984(36.53%)	1398(15.57%)
UK	228(3.63%)	579(21.49%)	807(8.99%)
Germany	69(1.1%)	126(4.68%)	195(2.17%)
China	51(0.81%)	216(8.02%)	267(2.97%)
Japan	15(0.24%)	42(1.56%)	57(0.63%)
Canada	21(0.33%)	48(1.78%)	69(0.77%)
Australia	33(0.53%)	21(0.78%)	54(0.6%)
France	105(1.67%)	60(2.23%)	165(1.84%)
Other Countries	246(3.91%)	228(8.46%)	474(5.28%)

<b>Total</b>	6285(100%)	2694(100%)	8979(100%)
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**Table-5: Geographical Distribution of Citations**

The study has shown that science researchers are more inclined towards foreign publications than social science researchers and researchers of science subjects highly cited the documents published from the developed countries.

### **Comparison between Printed-Citations and Web-Citations:**

The printed resources are communicated in one to one way but online materials or resources are communicated one to many methods. The table 6 states the difference between printed-citations and e-citations or web citations. It was observed that e-citations are very less cited (1.17%) in comparison to printed citations i.e 98.83%.

<b>Type of Citations</b>	<b>No. of Citations (%)</b>		
	<b>Social Science</b>	<b>Science</b>	<b>Total</b>
Printed-Citations	6192(98.52%)	2682(99.55%)	8874(98.83%)
Web-Citations	93(1.48%)	12(0.44%)	105(1.17%)
<b>Total</b>	6285(100%)	2694(100%)	8979(100%)

**Table-6: Comparison between Printed-Citations and Web-Citations**

### **Findings and Conclusion:**

The present study is a way to analyze information used by the university researchers community Based on the doctoral theses submitted at ICFAI University from 2012 to 2020 to trace the development of research. It is clear from the citations that research scholars of the university consulted enormous literature while preparing their theses.

Twenty three doctoral theses of the university were discussed here which contain 8979 bibliographic references with an average number of citations per theses come at a range of 390. It is found through the study that journals and books are widely used by the researchers of the university. Analysis of authorship pattern is an important factor in any citation analysis study. Normally, authorship of a document or paper has become important for researchers and scientists. The detailed study of the citation analysis reveals that publication nowadays is a team work rather than singly. Researchers mostly depend on the writings of the foreign authors, whereas publications published from India are cited most by the social science researchers in their theses. Present study reveals that most cited authors in the theses are foreign authors (59.65%) and citations of Indian authors are about 40.35% and publications published from India rank first with citations 61.18% of total citations. The publications published from USA and UK are ranked second and third respectively i.e citations (15.57%) and citations (8.99%).

It is noticed during the study that citations are not in standard format. Some researchers did not use any standard format or sequence while citing. It is also found that the publisher's name, place of publication, year are missing in several cases.

Every citation analysis is a very effective tool for decision making in selecting or rejecting information resources for the library. The study helps to weed out obsolete literature to make space for recent required literature. Citation analysis of doctoral theses will help to know information needs and requirements of the researchers. The data will be very beneficial in decision making for library collection and management.

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