International Conference on Innovative Research in Engineering, Management and Sciences
International Journal of Scientific Research in Computer Science, Engineering and Information Technology
© 2019 IJSRCSEIT | Volume 4 | Issue 9 | ISSN : 2456-3307

Citation Analysis of Grey literature reflected in Ph.D Thesis submitted to Visvesvaraya Technology University Belagavi.

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ABSTRACT

This Study made an attempt to analyse, the citations reflected inPh. D Theses submitted to Visvesvaraya Technological University, Belagavi, analysed for citing Grey Literature and Grey Literature form and subject wise distribution of articles cited from periodicals, Frequency and percentage distributions and measures of central tendency used to analyse data, and authorship pattern. Findings replicate that, Grey Literature is the most utilized reference material in the Theses, such as, Engineering and Technology, library science, in general, had the highest number of theses Submitted in the year 2014, with 136 and lowest number of thesessubmitted in the year 2009, with 23. The findings from this study could serve as a user study with implications for collection, development and user services designing in libraries.

Keywords : Citation Analysis, Grey Literature, Library and Information Science, Ph. D.Theses, VTU

I. INTRODUCTION

Analysis of data is the penultimate step in research process. It is the link between raw data and significant results leading to conclusions. This process of analysis has to be result oriented. In other words, it must aim at setting objectives and hypotheses. According to richardbudd, analysis leads eventually to summarizing procedures resulting in some sacrifice of details. Frequencies and column inches are summarized in tables as averages and percentages are transformed into guides or attention scores to be used as a single variable in summarizing the data. What is gained is, of course, more valuable. For the analyst in reality, has lost nothing by summarizing his quantification procedures. He has traded some unmanageable data for manageable information; he has exchanged his individual data for general answer, efficiency and scientific rigor. Thus, analysis is a process of summarizing or transforming raw data into useful information.

Citation studies attempt to study the characteristics of subject literature. The investigations of such kind of studies are found to be useful to manage the information resources and services in libraries and information centres.

In this chapter an attempt is made to study the characteristics of literature cited by research scholars in their PhD theses submitted to the Universities in Visvesvaraya Technology UniversityBelagavi. The results and discussions with regard to bibliographic form, Conference, Research reports, Workshop and

countrywise, subjectwise, authorship pattern and ranking of Theses which is another way, presented in different Tables and Figures.

II. REVIEW OF LITERATURE

Previous studies are the backbone for upcoming researchers but hardly research attempt have made on the topic grey literature, hence those studies have been considered for this paper.

VenugopalHajje and K. R. Mulla (2018).Made an effort to analyse the citations in Master's degree dissertations submitted to the Department of Library and Information Science, Rani ChannammaUniversity, Belagavi during the period 2012-13 to 2015-16, analysed for citing Grey Literature and Grey Literature forms. Frequency and percentage distributions(presented in charts, tables) and measures of central tendency were used to analyze data. Result shows that Grey Literature was the most utilized reference materials in the dissertations. Also, library science, ingeneral, had the highest number of Grey Literature cited in the year 2016,237(26.99%) and lowest number of Grey Literature cited in the year 2012-2013, 207(23.57%).

Ramesh Kuri and VenugopalHajje (2014).made an effort to analyse the citations cited in the "Pearl" Journal during 2009-2011. This analysis has been taken through the various analysis techniques such as Authorship pattern, Domain wise distribution of citations, Age of citations, most prominent journals cited and different sources of citations etc. At the end the study is concluded with some recommendations.

III. WHAT IS GREY LITERATURE?

- Grey literature is any material that has not been formally published by a commercial publisher. If you can buy it in a bookshop, it is probably not grey literature; it does not appear in books or journals.
- The term grey literature refers to research that is either unpublished or has been published in non-commercial form.
- In-house Publications are called as Grey Literature.

IV. TYPES OF GREY LITERATURE

Conference Papers, Blogs, Newsletters, Memoranda, Policy Statements, Bulletins, News Paper Clippings, Photographs, Emails, Statistics, Patents, Fact Sheets, Course Materials, Annual Reports, Posters, Legislation, Personal Communication, Pamphlets, Questionnaires, Thesis and Dissertations, Lectures, Book Chapters, Interviews, Government Documents, Press Releases, Physiological Specimens, Bibliographies, Essays, Speeches, etc.

V. STATEMENT OF THE PROBLEM

The present study deals with the citations replicated in the Ph.D Theses which submitted to the VTU thus this study entitled as "Citation Analysis of Grey Literature Reflected in PhD Thesis Submitted to the Visvesvaraya Technological University, Belagavi"

VI. OBJECTIVES OF THE STUDY

The specific objectives of the present study are to know.

- Total number of Thesis submitted to the university;
- Total number of grey literature cited by the authors;
- How many authors cited Grey Literature in their Thesis;
- Citation as appeared in the Thesis.

VII. SCOPE AND LIMITATIONS OF THE STUDY

Citation analysis of grey literature like any other study is not free from criticism. The following are some of the limitations of this study.

- The study is confined to thesis submitted to Visvesvaraya Technological University,Belagavi.
- The study is confined to only available theses in the VTU, University.
- The study is completely confined to the documentary.
- The study is confined to 10 years (2008 to 2017).

VIII. METHODOLOGY

The present study is concerned with the grey literature sources and began with the extensive literature search relating to grey literature referred in Ph.D theses. The study area covers all the Theses submitted to Visvesvaraya Technological University, Belagavi in the year 2008 to 2017. Based on the list collected from evaluation department the researcher searched these PhD theses in department and library. If theses not available in library the researcher consulted respective student or guide. The bibliography and references part were photo copied for detailed study. Total 778 numbers of available theses were taken for this study.

IX. DATA ANALYSES AND INTERPRETATION

Table-1Year Wise Submission of Theses

Year Wise Submission of Theses

S.L No	Year	Available Theses
1	2008	31
2	2009	23
3	2010	42
4	2011	72
5	2012	82
6	2013	94
7	2014	136
8	2015	110
9	2016	129
10	2017	59
Total		778

The table number 1 shows that year wise submission of Theses to Visvesvaraya Technological UniversityUniversity, Belagavi, in the period of Ten years from 2008 to 2017. In 2008,31 Theses were submitted to the University likewise 2009-23, 2010-42,2011-72,2012- 82,2013-94,2014-136,2015-110,2016-129 and 2017-59 each and it showing in Fig-1.

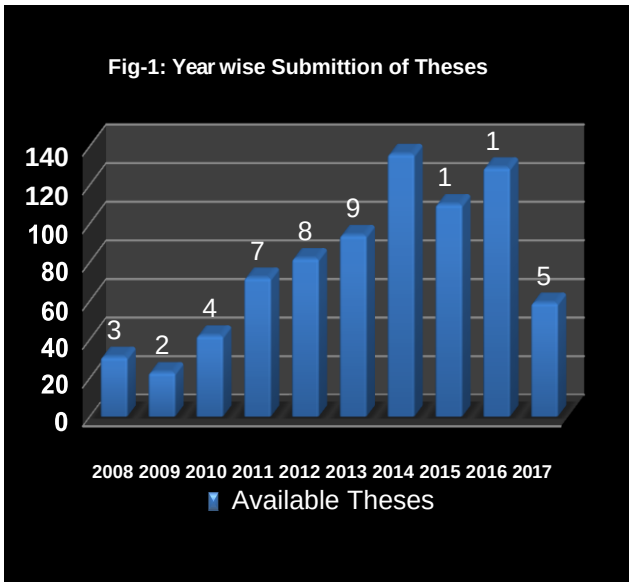

Table-2: Subject Wise and Data Type wise distribution of citations

Sl.No	Subject	Conf.	Thesis	Reports	Workshop	News paper	Seminar	weblink	Total Cit.	%
1	Chemistry	98	80	20	13	12	4	4	231	7.08
2	Civil Engineering	194	134	32	6	13	13	11	403	12.4
3	Computer and Information science	366	132	17	48	11	5	5	584	17.9
4	Electrical and electronics eng.	259	157	19	53	11	0	40	539	16.5
5	Mechanical Engineering	232	208	19	15	16	9	17	516	15.8
6	Technology	74	34	8	11	6	1	18	152	4.66
7	Physics	84	41	10	11	9	4	10	169	5.18
8	Mathematics	52	61	8	7	10	5	8	151	4.63
9	Biotechnology	58	30	14	10	5	2	2	121	3.71
10	Electrical Communication	24	15	12	7	5	1	1	65	1.99
11	Chemical Engineering	24	4	2	2	1	1	6	40	1.22
12	Environmental Engineering	14	2	5	2	8	2	1	34	1.04
13	Industrial and Production Engineering	36	4	14	2	2	1	6	65	1.99
14	Information & Science Engineering	12	1	2	2	6	3	4	30	0.92
15	Instrumentation Technology	18	3	5	1	3	3	4	37	1.13
16	Polymer Science and Technology	13	2	1	4	1	3	2	26	0.79
17	Telecommunication Engineering	16	2	9	6	1	2	2	38	1.16
18	Textile Technology Engineering	32	5	12	6	1	1	2	59	1.8
	Total	**1606**	**915**	**209**	**206**	**121**	**60**	**143**	**3260**	**100**
		49.3	**28.06**	**6.41**	**6.31**	**3.71**	**1.84**	**4.38**		

The Table no. 2, demonstratesthat 3260 citations cited in 1085 theses in engineering and technology are scattered primarily over 18 subjects. Out of total citations, 3260 citations are representing nearly 82% of the total are concentrated in five subjects, i.e. Chemistry, Civil Engineering, Computer and Information science, Electrical and electronics eng., Mechanical Engineering, Technology, Physics, Mathematics, Biotechnology, Electrical Communication, Chemical Engineering, Environmental Engineering, Industrial and

Production Engineering, Information & Science Engineering, Instrumentation Technology, Polymer Science and

Technology, Telecommunication Engineering, Textile Technology Engineering. They represent 17.91 %, 16.53 %, 15.82 %, 12.36 % and 7.09 % respectively of the total number of citations. Lagging much behind, next in order are citations relating to Chemical engineering, Biotechnology, Physics and Mathematics. They represent 1.23 %, 3.71 %, 5.18 % and 2.05 % respectively of the total citations. Citations relating to, Biochemical Engineering, Medicine and Bioscience together which represent 5.22 % of the total citations. Other subjects such as Polymer Science and Technology, Telecommunication Engineering, Textile Technology Engineering etc.

Table-3: Authorship Pattern

Year	Number of Authors											Total
	1	2	3	4	5	6	7	8	9	10	More than 10Auther	
2008	127	70	32	10	4	4	1	1	1	0	30	**280**
2009	121	69	33	23	8	2	1	2	0	2	13	**274**
2010	119	45	36	17	2	2	0	0	0	0	2	**223**
2011	154	101	73	15	13	4	0	0	0	0	4	**364**
2012	182	115	72	18	7	2	0	1	0	0	1	**398**
2013	219	97	48	20	5	1	0	0	0	0	11	**401**
2014	244	72	43	10	2	1	0	1	0	0	15	**388**
2015	227	57	69	23	2	1	0	0	0	0	10	**389**
2016	198	52	40	12	3	1	2	0	0	0	12	**320**
2017	122	40	33	10	3	1	2	0	0	0	12	**223**
Total	**1713**	**718**	**479**	**158**	**49**	**19**	**6**	**5**	**1**	**2**	**110**	**3260**
%	**52.54**	**22.02**	**14.69**	**4.84**	**1.50**	**0.58**	**0.18**	**0.15**	**0.03**	**0.06**	**100%**	

Collaborative research is very much a feature of the library and information science especially during the 21st century. It is a natural reflection of complexity, scale and costs of modern investigations in library and information science. Multi authorship provides different measures of collaboration in the subject. Table reveals the authorship pattern of the articles published during the period of study. Maximum numbers of Theses were contributed by two authors 215 (35.71%). This is followed by three authors with 189 (31.39%) articles, four authors contributed 113 articles (18.78%) and five and more authors contributed 47 (7.81%) of the total articles. The single author is contributed 38 (6.31%) of the total theses.

Table-4: Year Wise Authorship Pattern

Author	Year											%
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total	
Single	127	121	119	154	182	219	244	227	198	122	1713	**52.54**
Joint	718	479	158	49	19	6	5	1	2	110	1547	**48.58**
Total	**825**	**580**	**257**	**183**	**181**	**205**	**229**	**208**	**140**	**175**	**3260**	**100%**

Degree of collaboration in the Indian Journal of Agricultural Research

The formula given by K. Subramanyam is useful for determining the degree of collaboration in quantitative terms. The study followed the same formula which is mathematically put as:

$$C = \frac{MN}{MN+NS}$$

Where C = Degree of Collaboration

NM= Number of Multi author

NS= Number of Single author

In the present study

NM=1547

NS= 1713

$$C = \frac{1547}{1547+1713} = 0.519$$

X. FINDINGS & SUGGESTION

Followings are the major findings of this study:-

- Maximum numbers of Theses were contributed by two authors 215 (35.71%).
- 3260 citations cited in 1085 theses in engineering and technology are scattered primarily over 18 subjects.
- Yearwise submission of Theses to Visvesvaraya Technological UniversityUniversity, Belagavi, in the period of Ten years from 2008 to 2017.

Hence grey literature need to be highlighted because many researchers neglected these kind of sources.

XI. CONCLUSION

The Resource management is the efficient and effective operations of an organization's resources when they are needed. This kind of citation analysis study will definitely help the librarians to understand information needs, use of pattern and use of various resources of research scholars and accordingly selection of useful resources as there is

an explosion of information and documents in various formats.

This study helps to know how many authors were cited Grey Literature for their research publications especially Ph. D. Theses, and it also emphasis on the usefulness of grey literature in the research and development activities.

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