CITATION ANALYSIS OF POST GRADUATE AGRONOMY DISSERTATIONS: A CASE STUDY FROM A CENTRAL AGRICULTURAL UNIVERSITY IN BIHAR, INDIA

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The present study is the citation-based analysis of 48 Post Graduate dissertations in Agronomy submitted in Central Library of Dr. Rajendra Prasad Central Agricultural University, Pusa, Smastipur, Bihar during 2013-2020. Dissertations were extracted from the Krishikosh Institutional Repository and Citations were imported in Excel and plain text file for analysis on various parameters. Altogether 4599 citations were recorded. The study reveals that Journals were the most cited source followed by books and book chapters, Web Portals and thesis and dissertations. Based on this, local journal's rank list is prepared. The analysis also carried the application of Bradford's law of document's scattering to trace the core journals in Agronomy based on their use. The Study also revealed that top 30 journals ranked among most used journals contributed to more than 50% of all the citations.

Keywords: Agronomy, Citation Analysis, Bradford's Law, Krishikosh, Co-Citation.

INTRODUCTION

Citation analysis is an essential tool under bibliometric studies and similar area of research. Citation analysis is directly used by information professionals, researchers, collection building librarians to find out the usage statistics of resources in written scientific communications such as thesis and dissertations, research papers, web URIs and other sources. It is also used at a greater extent to find out the gap or discrepancy in building and proposing institutional collection development policies. "Citation analysis" refers to references in one text to another text, with information on where that text can be found. Citation analysis is effectiveness in terms of its usability and establishing the intra or inter-disciplinary subject similarity or relative scenario, source dominance, trends of published literatures, areas and authors effectiveness etc. The studies on citation analysis are not new although its application across the discipline is varying over the years and coming times. The earliest recorded citation study was conducted by (Gross &Gross, 1927) who analysed citation patterns to find

out the journals to be subscribed and also for knowing the efficacies of back volume at the library of Pomona College. Using citation analysis, we can able to evaluate and interpret citations characteristics received by publications, authors, their affiliations, and other indications of scientific activity (Ravichandra Rao, 1993). Citation analysis also comprehend the ideas of classic laws given under bibliometrics such as Bibliographic Coupling (Kessler, 1961) and Co-Citation Analysis (Small, 1973). Citation analysis can also be utilized to perform user's studies and to mine their Information Need Analysis (INA) and preferences and that will ultimately be fruitful while evaluating collection and stock systems. Earlier it was in practice of manual evaluation by analysing published references in journals and other publications but now, the procedures are much coherent, easy but utmost effective even today.

UNIVERSITY AT A GLANCE: EDUCATION AND RESEARCH ACTIVITIES

Dr. Rajendra Prasad Central Agricultural University, Pusa was established on 7th October, 2016. In its archive, the university owes legacy to state agriculture university, Rajendra Agricultural University, Pusa established in 1970 and earlier to that Agricultural Research Institute and college, Pusa established in 1905. The university extends its jurisdiction and responsibility in the fields of teaching, research and extension in context of agriculture and allied sciences to the whole country with special reference to the State of Bihar. The academic set up of the university comprises of 08 colleges *viz.* Tirhut college of agriculture, College of Agricultural Engineering, Home Science, Basic Sciences and Humanities, Fisheries and Pt. DeenDayal Upadhyay College of Horticulture and Forestry, Agri-Business & Rural Management and 01 Sugarcane Research Institute with work force of 215 scientists. The extension set up of the university comprises of 18 Krishi Vigyan Kendras and Agricultural Technology Information Centre (ATIC) which looks after the transfer of technology activities of the university. The university also puts major efforts in development of technologies and crop varieties suitable for different agro-ecological conditions through various operational research projects. Thus, the Institution is known to be the pioneer in organised agricultural research and education in India.

LITERATURE REVIEW

In 2005 Gao, Yu, and Luo (2009) studied a total of 56 PG thesis have been analysed at Wuhan University, across multiple subjects and found that majority of the citations were drawn from web and other electronic resources. The analysis also revealed that the availability of number of primary sources material as cited sources were so high in China. However, on a language side, in a subject like Library and Information Sciences, very few citations were found in English and most of the work displayed there was in their local language. Gayan and Singh (2021) analysed doctoral dissertations in the subject mathematics at Tripura University and revealed that Journals were most cited sources in the field of Mathematics accounted nearly 82% of the entire citations. Kumar and Dora (2013) studies 49 doctoral thesis submitted at Indian Institute of Management,

Ahmedabad and revealed that although, Journals were the most cited sources, there were a greater number of least cited journals or cited only once which in result is further suggested by the authors that before planning for collection development validation over these journals is a must. Kelsey and Diamond (2003) investigated the citation characteristics of forestry discipline at different faculty levels and concluded that there is a significant difference in citation pattern at each level. Interestingly the researchers also suggested that by determining the core journals in Forestry, faculties can also plan their future promotions and tenure along with interdisciplinary progress. Bala and Singh (2015) focused their study of citation analysis on 17 doctoral theses of Agronomy and Plant Breeding between 2010-2014 subjects submitted at CCSHU, Hisar to find out the different bibliographic form used in citations. They found that the application of Bradford's law of scattering doesn't fulfil the criteria of analysis and almost 40% of the journals used in the thesis were Indian journals whereas top 20% of journals cited in the subject Plant Breeding and Genetics were also from Indian journals. The authors also commented on the temporal validity of the citations used and found that majority of the references used were too old which does not necessarily reflect the current research trend in the respective fields. Kittur and Bankapur (2017) conducted their study on 36 doctoral theses of Crop Physiology with 7499 total citations. This study also encompasses similar results like aforesaid studies, and revealed that majority of the sources are journal sources but researchers are slanted more towards citing Indian journals rather foreign journals. Authorship pattern in the citations used by the researchers also revealed that papers with dual authorship were cited mostly followed by single authors and three authors. Web portals and e-resources were least discovered sources in those citations which demands the establishment and procurement of collections in e-resources form. As per the literature available, no such study has ever conducted in the state of Bihar to assess the citation patterns in the field of Agronomy. Therefore, this study can fill this gap by providing an insightful information to both Agri-librarians and scientists/researchers.

NEED OF THE STUDY

The extension of Agriculture Education and Research in India has come way forward after the emergence and establishment of new topical and disciplinary Institutes and research centres, but unfortunately the inconsistence perseverance in the funding allocations for its libraries and information centres made it very difficult for the information professional to have an overall Agri-bibliographic control. Resulting libraries and information centres lacs adequate funding which results in forming improper collection development policy for acquisitioning comprehensive and useful library collection. From the full report of (Bosch et al., 2020) on Higher education states that it is continues to grapple with an uncertain future in every country where student enrolments are stagnant, declining and putting financial pressure on institutions. Library budgets are mostly fixed or shrinking, and libraries are once again grappling with the dreaded double of cost inflation and stagnant revenues. Many libraries cancel their magazine packs, multi-use them, or cut back on their current expenses,

the only way to buy where demand matches price. Others are actively renegotiating contracts with publishers to reduce ongoing costs. In this regard, it only came on to libraries to priorities their collections and propose new adjustment and policies. Now, for this process libraries take many processes underway to look into the usability of subscribed materials, user's survey, feedback mechanism-based reports analysis in order to decide and plan the past, ongoing and future library subscriptions so that efficient allocation of funds can be achieved. The present paper aimed to find out the core journals in the discipline of Agronomy by analysing the citations in the 48 post graduate's dissertations submitted to the Dr. Rajendra Prasad Central Agricultural University, Pusa, Samastipur, Bihar from the year 2013 to 2020.

This sort of study could easily justify and can be used as a tool or basis for developing a usage targeted library collection acquisition policy. Using this study, Scientists can able to track core journals used by PG students of Agronomy and based on this, they can suggest, guide and plan their future post graduate research topics to the students. They can also able to prioritise their journal selection choices and collaborations in publishing future post graduate research works. For librarians, the study can help to choose most prominent journals and other sources in Agronomy and thus utilizing their funds efficiently.

OBJECTIVES OF THE STUDY

The study comprises following key objectives to reveal the citation usability and characteristics in addition to journal usages by the PG students at the University. Key objectives are as follows:

1. To identify most prominent information sources types cited by PG students in their dissertations
2. To find out most cited journals by PG students in their dissertations
3. To identify core publishing journals in Agronomy discipline used by PG students using Bradford's law of scattering

METHODOLOGY AND SCOPE

The citation data were collected from the theses submitted at central library of the University from session 2013 to 2020 and a total 48 post graduate thesis have been selected. A total of 10446 citations were retrieved from these theses and captured in Excel and plain text file for the purpose of further analysis on various parameters such as source distribution, top-cited sources, preferred cited country, language, primary or secondary sources *etc.* The eight-year sample size covering 48 theses were chosen for analysis to have an exhaustive but clear conclusion.

ANALYSIS AND FINDINGS

Yearly distribution of thesis

The Table 1 demonstrated the year wise submission of thesis from the year 2013 to 2020. On average 6 thesis per year were submitted with highest number of theses submitted in the year 2018 followed by year 2019 and 2016.

Table1: Yearly distribution of thesis

Year of Submission	2013	2014	2015	2016	2017	2018	2019	2020	**total**
No. of Thesis Submitted	4	4	5	7	5	11	10	2	**48**

Types of Information Sources Cited

It is very evident from the analysed Table.2 that the greatest number of cited sources were journals covering 3136 (68%) of total citation percentage and hence ranked 1, followed by Books and book chapters which comprises although only 9.20% of all citations, ranked 2. PG students used thesis and dissertations as their third priority with an overall 7.24%. They used secondary sources such as encyclopaedias, handbooks *etc.* as their fourth priority which contributes 2.96% of total citations. The key point here is over the years these PG dissertations have witnessed a considerable growth as number of cited sources from e-resources, websites, portals, social media pages, and blogs were increases. Table also revealed that sources such as working papers and government publications were among the lesser cited sources hence, a clear-cut policy document can be framed by the library while making them consider for procurement process.

Journals as highest number of cited sources is reflecting the similar previous studies where journals emerged out as the primal source. The lesser margin of web resources indicates that researcher's lesser attention towards web resources which demands again intense sessions on training for access mechanism and search strategies.

Table 2: Types of Information Sources Cited

Type of information sources	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**Total Citations**	**Citation%**	**Rank**
Journal articles	243	264	388	449	324	731	626	111	3136	68.19	1
Book and book chapters	36	42	51	67	36	89	91	11	423	9.20	2
Websites and Portals	2	1	3	14	11	34	46	21	132	2.87	5
Thesis and dissertations	21	29	41	59	39	55	76	13	333	7.24	3
Working papers	3	1	1	2	0	2	3	1	13	0.28	12
Conferences/workshops	9	2	3	16	12	16	19	2	79	1.72	7
Newspapers and	5	6	4	3	4	12	19	10	63	1.37	9
Social Media, Blogs	0	1	2	13	16	34	31	12	109	2.37	6
Secondary Sources (Encyclopaedias, Handbooks)	12	11	8	23	24	32	20	6	136	2.96	4
Case Studies	4	6	7	12	20	10	9	1	69	1.50	10
Government Publications	2	1	2	2	9	13	1	1	31	0.67	11
Others	9	8	13	19	18	3	5	0	75	1.63	8
Total	**346**	**372**	**523**	**679**	**513**	**1031**	**946**	**189**	**4599**	**100.00**	

Most cited Journals

Analysis of citations data further revealed that a total of 627 different journal titles were used for citing 3136 times. Table 3 shows the top 30 most cited journals which clearly shows the dominance of Indian Journals as compared to foreign journals. These 30 journals were cited at least 13 times and with 2121 citations all together comprises almost 67% of the whole citations. Rest of the 33% of journal citations were from others journals collected together. Nine journals are such journals which were cited more than 100 times. Among all, Indian Journal of agricultural Science with 256 citations emerged as the most cited journals by the PG students in their thesis, followed by Indian journal of Agronomy with 231

Table 3: Top 30 most Cited Journals

Sl. No.	Journal Titles	Total Citations	Rank
1	*Indian Journal of Agricultural Science*	**256**	**1**
2	*Indian Journal of Agronomy*	231	2
3	*Indian Journal of Weed Science*	123	3
4	*Weed Technology*	120	4
5	*Legume Research*	117	5
6	*International Journal of Agriculture Biology*	113	6
7	*Indian Journal of Pulse Research*	107	7
8	*Crop Weed Technology*	102	8
9	*Acta Agronomica*	101	9
10	*Agronomy Journal*	94	10
11	*Journal of Agricultural and Biological Science*	70	11
12	*Indian Journal of Crop Science*	61	12
13	*Annals of Agricultural Sciences*	60	13
14	*Indian Journal of Plant Physiology*	60	14
15	*Canadian Journal of Plant Science*	59	15
16	*Asian Journal of Plant Science*	56	16
17	*Chinese-Journal of Eco Agriculture*	53	17
18	*African Journal of Agricultural Research*	52	18
19	*Crop Protection*	51	19
20	*International Journal of Pest Management*	41	20
21	*Journal of the Indian Society of Soil Science*	35	21
22	*Asian Journal of Horticulture*	31	22
23	*Journal of Plant Nutrition*	18	23
24	*Australian Journal of Crop Science*	18	24
25	*Madras Agricultural Journal*	17	25
26	*Indian Journal of Fertilizers*	17	26
27	*Potato Research*	16	27
28	*Pakistan Journal of Weed Science Research*	16	28
29	*Environment and Ecology*	13	29
30	*Archives of Agronomy and Soil Science*	13	30

citations, Indian Journal of Weed science with 123 citations, Weed Technology with 120 citations, Legume research with 117 citations were among top five in the list. In the list number of foreign origin journals were less and only few journals from Australia, Canada, China, US and Pakistan were among list of top 30 most cited journals.

These highly cited journals are very essential and therefore they must be procured inside the library. This, ranking of journals becomes an important collection management tool for librarians, record keepers as well as researchers.

Applying Bradford's law of scattering

Scientometric study also deals in identifying core journals in a domain. Under this perview S. C. Bradford in the year 1934 has proposed his law as scattering of documents in a field.Bradford law states as "if scientific journals are arranged in order of decreasing productivity of articles on a given subject, they may be divided into a nucleus of periodicals more particularly devoted to the subject and several groups or zones containing the same number of articles as the nucleus. When the number of periodicals in the nucleus in the and succeeding zones will be as 1: n: n2" where n is a multiplier (Bradford, 1934). S.C Bradford also proposed a graphical model for accompanying his law. From here there were few mathematical models were also suggested later by Vickery (1948), Leimkuhler (1967), Brookes (1969a, 1969b), Wilkinson (1972), Egghe (1985, 1986, 1990a, 1990b), Basu (1992), and Ravichandra Rao (1998). These zones are divided based on the core and relevant journals the first zone is termed as nucleus zone, followed by peripheral and outer zones. As we will move away from the nucleus number of journals will also increase. Table 4 demonstrated the ranked list of journals with their respective citations ranking and cumulative data which will further verify by the Bradford's zonal scattering and will prove the fitness of data.

The first step to identify core journals is to calculate the Bradford's constant "K" which is a multiplier that will be used to calculate the raising journals and citation density for each zone. We will use Egghe (1990), Rousseau (1990) and Andres (2009) formulation to find the value of "K" to find if Bradford's law is fit for this analysis:

$$\mathbf{K = (e^{\gamma} \times Y_m)^{1/p}}$$

Where, **γ** is the Euler's number (γ=0.5772) and $\mathbf{Y_m}$ is the maximumnumber of citations that the top journal has received (here it is 256), P denotes the number of zones in Bradford's grouping.

Putting $\mathbf{Y_m}$= 256and **P** =3
We get,

$$\mathbf{K} = (2.718^{0.5772} \times 256)^{1/3}$$

$$= (1.781 \times 256)^{1/3}$$

$$= (455.936)^{1/3}$$

$$= 7.541$$

Now, we have to calculate the number of journals in core zone of Bradford's group

i.e. r_0

$$r_0 = T(K-1) \div (K^p-1)$$

where T = total number of journals in the analysis, k is the Bradford's constant and as earlier

Table 4: Distribution of Journals based on their Citation Ranking

No. of Journals(N)	Cumulative no. of Journals	No. of Citations(C)	Total no. of Citations(N*C)	Cumulative no. of Citations
1	1	**256**	256	256
1	2	231	231	487
1	3	123	123	610
1	4	120	120	730
1	5	117	117	847
1	6	113	113	960
1	7	107	107	1067
1	8	102	102	1169
1	9	101	101	1270
1	10	94	94	1364
1	11	70	70	1434
1	12	61	61	1495
2	14	60	120	1615
1	15	59	59	1674
1	16	56	56	1730
1	17	53	53	1783
1	18	52	52	1835
1	19	51	51	1886
1	20	41	41	1927
1	21	35	35	1962
1	22	31	31	1993
2	24	18	36	2029
2	26	17	34	2063
2	28	16	32	2095
2	30	13	26	2121
2	32	12	24	2145
3	35	11	33	2178
4	39	10	40	2218
7	46	9	63	2281
7	53	8	56	2337
8	61	7	56	2393
8	69	6	48	2441
9	78	5	45	2486
10	88	4	40	2526
20	108	3	60	2586
31	139	2	62	2648
488	627	1	488	3136

discussed P = number of zones in Bradford's grouping = $627(7.541-1) \div ((7.541)^3-1)$

$= 4100 \div 427.66$

$= 09.58$

And now we can calculate the no. of journals in each group by using the multiplier ***k***

$\mathbf{r_0} = r_0 \times 1 = 09.58$

$\mathbf{r_1} = r_0 \times k = 72.24$

$\mathbf{r_2} = r_0 \times k^2 = 544.63$

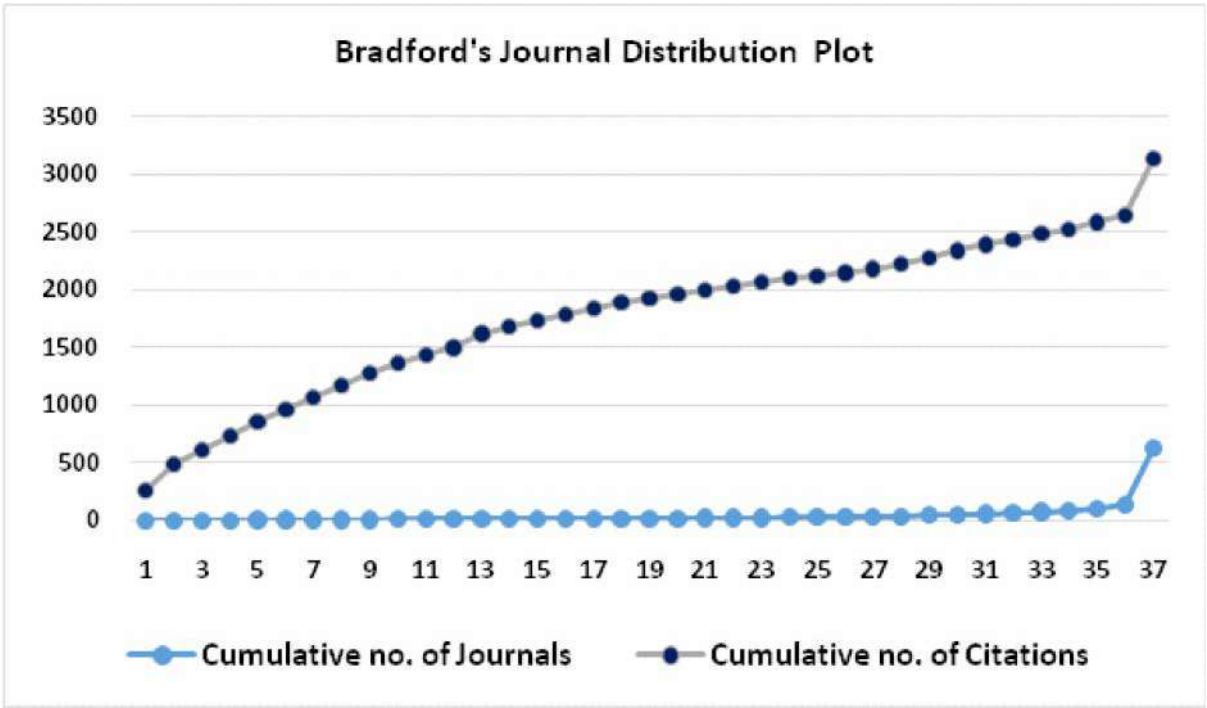
Table 5: Bradford's distribution of journals based on zones

Group Zone	no. of journals	no. of citations	K
Core Zone	10	1364	
Zone 1	72	721	7.631
Zone 2	545	1051	7.806

The number of citations calculated as shown in the Table.5 and with their distribution we can check the Bradford's distribution and fitness based on the data that we have collected in our analysis.

Taking in to consideration the exact number of citations, the K value (Bradford's constant) is also calculated which is quite similar to the value of K that we have obtained using the formulae above. This clearly indicates that data presented in this distribution fit into the three distributive groups. Zones. Also, to find out how these citations are distributed, using Bradford's law we have inclined the cumulative number of journals and cumulative numbers of citations on X-axis and Y-axis respectively (Graph1.0). The graph shows that minimum productive journals were cited a smaller number of times. The graph also indicated that there are only few journals which are cited a greater number of times (as top 30 most cited journals contributes to almost 67% of citations) and more journals were cited lesser number of times.

Graph 1.0 Bradford's Journal Distribution Plot



CONCLUSIONS AND SUGGESTIONS

The study comprises of Citations Analysis of 48 PG theses on Agronomy depicted that most cited sources were Journals (68%). Therefore, it can conclude that rather showing their much dependencies on e-books, proceedings and other e-resources, researchers focus on Journals and books as their primary and secondary means respectively. The study also revealed that the core group of journals contributes to the most shared citations although their subject coverage is not necessarily directly inclined to Agronomy. Therefore, following implications and recommendations can be drawn for the library from the study:

1. As Journals and books came out as the most prominent and used sources by PG students, libraries should focus to allocate funds to strengthen these two sources in the field of Agronomy.
2. Study also recommends to organize training and awareness sessions on use of web resources and e-resources subscribed by the library for scientists (dissertation's guide) and students of Agronomy discipline as they have less consulted these sources.
3. Library should focus more towards acquisitioning of Indian Journals in the field of Agronomy at the post graduate level as journals published from ICAR are most prominently cited at PG level.
4. Libraries should send their request to ICAR for inclusion of Indian journals in the field of Agronomy (both subscription based and open access journals) to cover in CeRA (Consortium of e-Resources in Agriculture).
5. As lesser diversity found in scattering of journals cited by PG students in Agronomy discipline, scientists can revisit the fact that why majority of journals were cited lesser number of times and why PG students are citing more Indian authors and journals than foreign authors and journals? This can provide them an insight with their future publishing practices and research proliferation with respect to foreign collaboration.

The study can help to assess the Information Need Analysis (INA) of faculty, students and researchers at the doctoral level also. Library has to rethink before subscribing those large number of journals as they are less cited (as 627 such journals were revealed with one citation only). The study revealed that in order to plan the collection development policy, disciplinary citation analysis practices can be very useful. Highly cited journals by PG students must be made available via library. A keynote can also be taken in the form of developing inter-domain specific and intra-domain specific journals so that researchers can also have trend of latest research in more foreign journals.

Therefore, it can be said that libraries and information centres of all types have experienced a continuing stretch between demand and availability of library collections, but studies like this can contribute to a notion where documents procurement policy and preferences can be made cordial. Further studies can be done by adding more departments, more published literatures,

and increasing scope at doctoral level also to have an overall assessment of library holdings. Studies can also be made based on the inter-and intra-disciplinary collaborations and their citation characteristics.

REFERENCES

1. Bala, S., & Singh, J. (2015). Citation analysis of Ph.D. theses in agronomy and plant breeding submitted at CCHA, Hisar during 2010-2014: A comparative study. *Information Studies*, 21(4), 205. https://doi.org/10.5958/0976-1934.2015.00016.6
2. Bosch, et.al. (2021). The New Abnormal: Periodicals Price Survey 2021 retrieved from https://www.libraryjournal.com/?authorName=Stephen%20Bosch,%20Barbara%20Albee,%20and%20Sion%20Romaine.
3. Chikate, R. V., & Patil, S. K. (2008). Citation analysis of theses in library and information science submitted to University of Pune: A pilot study. *Library Philosophy and Practice*, 222, 31-55.
4. Cox, J. E. (2008). Citation analysis of graduate dental theses references: Implications for collection development. *Collection Management*, 33(3), 219-234.https://doi.org/10.1080/01462670802045558
5. Desai, N., Veras, L., &Gosain, A. (2018). Using Bradford's law of scattering to identify the core journals of pediatric surgery. *Journal of Surgical Research*, 229, 90-95.https://doi.org/10.1016/j.jss.2018.03.062
6. Egghe, L. (1990). A note on different Bradford multipliers. *Journal of the American Society for Information Science*, 41(3), 204-209.https://doi.org/10.1002/(SICI)1097-4571(199004)41:3<204::AID-SI7>3.0.CO;2-8
7. Egghe, L., & Rousseau, R. (1990). *Introduction to informetrics: Quantitative methods in library, documentation and information science.* Elsevier Science Publishers.
8. Gao, S. J., Yu, W. Z., & Luo, F. P. (2009). Citation analysis of PhD thesis at Wuhan University, China. *Library Collections, Acquisitions, and Technical Services*, 33(1), 8-16.https://doi.org/10.1016/j.lcats.2009.03.001
9. Gayan, M. A., & Singh, S. K. (2021). Citation analysis of Mathematics: a scientometric study based on PhD theses, Tripura University. *Library Philosophy and Practice*, 1-14. Available at https://digitalcommons.unl.edu/libphilprac/5167
10. Gross, P. L., & Gross, E. M. (1927). College libraries and chemical education. Science, 66(1713), 385-389. Available at https://www.jstor.org/stable/1651803
11. Kessler, M. M. (1963). Bibliographic coupling between scientific papers. *American Documentation*, 14(1), 10-25. https://doi.org/10.1002/asi.5090140103

12. Kumar, H. A., & Dora, M. (2011). Citation analysis of doctoral dissertations at IIMA: A review of the local use of journals. *Library Collections, Acquisitions, and Technical Services*, 35(1), 32-39.https://doi.org/10.1016/j.lcats.2011.03.002

13. Leimkuhler, F. F. (1967). The Bradford Distribution. Journal of Documentation, 23(3), 197-207. https://doi.org/10.1108/eb026430

14. Pillai, K. G. (2007). Journal citations in Physics doctoral dissertations of Indian Institute of Science, 54, 177-184. Available at http://hdl.handle.net/123456789/3256

15. Rao, I. R. (1998). An analysis of Bradford multipliers and a model to explain law of scattering. *Scientometrics,* 41(1-2), 93-100.

16. Small, H. (1980). Co citation context analysis and the structure of paradigms. *Journal of Documentation,* 36(3), 183-196. https://doi.org/10.1108/eb026695

17. Vickery, B. C. (1948). Bradford's law of scattering. *Journal of Documentation*, 4(3), 198-203. https://doi.org/10.1108/eb026133

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