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## Citation Analysis of Library and Information Science Masters Theses: A Tool for Collection Development in University Libraries

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# Citation Analysis of Library and Information Science Masters Theses: A Tool for Collection Development in University Libraries

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## ABSTRACT

This study analyzes the citations of Masters Theses in Library and Information Science of Nnamdi Azikiwe University, Awka, Nigeria submitted from 2011 to 2018 with a view to determining the format and age of materials used and most frequently cited journals. The document checklists were used for data collections and the citations were extracted from the title pages and reference lists of each of the theses. Data obtained from 48 Masters Theses were examined. The study found that 47.22% of cited items were monographs followed by journals - 31.21%, 8.5% were reports, 4.05% were web resources and 3.65% were conference proceedings. This is contrary with other citation analysis, which found that journals are the most frequently used format. The study also revealed that 21 journal titles were the most frequently cited journals by Library and information Science postgraduate students. The study discovered that the average age of materials used were 10- 20 years and that Library Philosophy Practice (e-journal) was the most cited journal title. The findings did show that citation analysis of theses is veritable tool for collections development. The implication of this study is that it could serve as a collection development tool that can be used as a model for the library to identify the primary sources for acquisitions and also as a guide for collection maintenance. It is based on this that it was recommended that university libraries should as a matter of professional responsibility ensure yearly analysis of theses as part of their documentation policies.

**Keywords:** Citation analysis, These, Library and Information Science, Collection development tool, References analysis, Academic libraries

## 1.0. Introduction

As explained by Library and Information Science Education Network (2022), citation analysis is a non-intrusive method of finding patterns in specific populations' use of research materials when one author cites another author, a relationship is established. Citation analysis uses citations in scholarly works to establish links. Many different links can be determined, such as links between authors, scholarly works, journals, fields, or even between two or more nations. Citations both from and to a certain document may be studied. Citation analysis is very useful to find out the influence of a single author on a given field by counting the number of times the author has been cited by others. Citation analyses permit researchers to see how frequently a work has been cited in articles and are an invaluable tool for any literature review. Hence citations are nothing but the bibliographical references which are generally added with every research communication. A document referred in another article is called the cited document, and the previous the citing document. Description of the cited article is called a citation. It includes the statement of authorship, document, pagination, year of publication, places etc. The pattern of citation may change as per the types of publication.

The citations also known as reference is therefore a branch of Bibliometrics that examines the citations found in publications such as journal articles and books (Georgas and Cullars, 2005) Bibliometrics generally is a set of measurement techniques which are usually used with the application of mathematical and statistical methods to books and other media of communication. Bibliometrics say-to speak, is not a single term it includes informetrics, scientometrics, webometrics altmetrics, and citation analysis, among others. It is conventionally used by the librarians and professionals related to the subject of library and information science for studying the process of communication, information flows, and related topics for better understanding and effective management and dissemination of information (University of Maryland (2022)).

It is in the light of the above that it has remained a common approach by well organized academic libraries to using citation analysis in ascertaining available literature, faculty publications or graduate students' theses for a particular department at a particular institution. This practice is built on the premise that items cited in students' dissertations show the resources they used in their research writing. This type of analysis it is noted can yield valuable insights into local citing trends, such as types and number of documents cited, age of citations, and changes in citation patterns over time (Ashman, 2009).

With current economic crunch and insufficient funding of university libraries in particular, there arose the challenge of what types of information materials should be acquired as to satisfying the information needs of graduate students in particular, considering the fact, that with information and communication technology (ICT) which has led to astronomical growth of information also known as era of information explosion librarians cannot on their own determine the information needs of graduate students without doing the needful. To this end, citation analysis of theses is seen as one of the ways against this morass. This is because, analysis of theses reference lists is one approach used to measure library use by graduate students, who are traditionally frequent and heavy library users. In general theses are considered as valuable road signs to the literature of a discipline (Cox, 2008). Theses clearly indicate the needs of graduate students and also indicate the research specialties of the faculty and department as a whole. Citation analysis is extensively used as a tool in collection development and can act as a tool for selecting and de-selecting materials as it providing insight into the materials that are selected by various user groups. As noted by Rethiefsen (2007), it can be a useful technique for identifying potential collection development weaknesses as well as helps the librarians to identify unique information that was not found from other library statistics.

In fact in Nigeria, many university libraries are under pressure to make difficult decisions regarding older materials sitting on shelves, including journals what type of new materials to acquire as to satisfying the information needs of teeming postgraduate students as well as making space available to stock acquired materials. All the above critical challenges are faced by the library of Nnamdi Azikiwe University as a microcosm of the macrocosm called Nigerian universities. To this end, in order to make rational decisions on what materials should be in the shelves and what can be moved out of the shelves, it can be assessed by examining the age of cited resources by library users. It is against this backdrop and with evidence indicating that such practices are not common in Nigerian universities that this study has become imperative aimed at analyzing citations in the Library and Information Science Masters theses with a view to bridging the gap and creating the awareness for librarians in this part of the globe to understand the needs for analyzing citations in these valuable information resources using Prof. Festus Library, Nnamdi Azikiwe University, Awka, Nigeria theses submitted from 2011 to 2018 as case in point.

### **1.1. Research Objectives**

The main objective of this study is to analyze the citations in library and information science masters' theses and built up indicators to support library's collection development. Other objectives are to:

1. Identify the different types of resources cited by the masters' students;
2. Ascertain the age of the resources cited in relation to the year theses were published and
3. Determine the most frequently cited journals within library and information science theses

### **1.2. Research Questions**

This study was guided by the following research questions:

1. What type of information resources were cited by Masters Students in Library and Information Science theses?
2. What were the ages of information resources cited in relations to the years the theses were published?
3. Which were the most frequently cited journal titles in the theses?

## **2.0. Review of related Literature**

Collection development is simply defined as the systematic assessment, selection, and de-selection of library resources (Alexander, 2003) while citation analysis according to LIS Education Network (2022), is a non-intrusive method of finding patterns in specific populations' use of research materials when one author cites another author, a relationship is established. Citation analysis therefore, uses citations in scholarly works to establish links. Many different links can be determined, such as links between authors, scholarly works, journals, fields, or even between two or more nations. Citations both from and to a certain document may be studied. The implication is Citation analysis is very useful to finding out the influence of a single author on a given field by counting the number of times the author has been cited by others and also permits researchers to see how frequently a work has been cited in articles and are an invaluable tool for any literature review.

Hence citations are nothing but the bibliographical references which are generally added with every research communication. A document referred in another article is called the cited document, and the previous the citing document. Description of the cited article is called a citation. It includes the statement of authorship, document, pagination, year of publication, places etc. The pattern of citation may change as per the types of publication. The citations also known as references as explained by Lehman College Leonard Lief Library (2022), is how you tell your readers that information in your writing came from other sources as well as how they can find it and to give credit to the authors of the source of your information; to enable readers locate the source; either to verify your information or to find out more about it. to help readers distinguish your own thoughts and claims from those of your sources and to make ones writing more convincing by showing that your information comes from a source.

The underlying premise is that the more frequently cited publications are the more valuable, will continue to be used heavily and consequently, are more important to have in the library collections (Johnson, 2007). Collection-focused activities that make use of citation data include examining print versus electronic usage to determine the impact of electronic journals, compiling lists of most and least cited journals and local holdings to make acquisitions or cancellation decisions, and examining age of cited references to help develop storage and retention policies (Smith, 2003). Gross and Gross (1927) used for the first time this citation analysis as a tool for identifying the core journals in a subject based on counting the citations given at the end of each article from a group of a primary journals. Afterwards, a number of such studies were carried out in citations in dissertations/theses, books, primary journals and reviewing journals. Buchanan and Herubel (1994) and Edwards (1999) assert that the ratio of journal articles to monographs is lower in the humanities and social sciences. Their study of citations in political science dissertations supports this view of the social sciences (46.7%) of citations to monographs, but neither study cites research to support this contention with regard to other social sciences or the humanities.

Available evidence did show citation analyses have been in use as a collection development tool within the disciplines of engineering, linguistics, education, sciences and psychology (Williams & Fletcher, 2006; Georgas & Cullars, 2005; Haycock, 2004; LaBonte, 2005; Sylvia, 1998).

Multi-disciplinary studies by Kushkowsky, Parsons and Wiese (2003) and E.T.Smith (2003), and a survey of English literature masters theses by Slutz (1997) indicate that selected humanities and social sciences are dependent on monograph. Slutz calculated that 50.2% of citations in English Masters theses were to books and 27.4% to journal articles. However, all three studies examined comparatively small data sets for humanities and social sciences. For example, their data sets for humanities were n=approximately 449; n=377; and n=938 citations respectively.

Several studies have suggested that within this general pattern, the age distributions for humanities and social sciences are flatter because of the greater use of older materials. One method of comparison is to calculate the mean and median ages, which according to this hypothesis, would be higher in humanities and social sciences. In their study, Kushkowsky, Parsons and Wiese (2003) report an overall mean of 12.3 years for their multidisciplinary survey and 18.1 years for humanities. They also report an overall median of eight years and ten years for humanities, but the latter statistic is also reported for some science disciplines. This prevents them from distinguishing between an emphasis in the natural sciences on recently published research and an emphasis in the humanities and social sciences on older foundational publications.

On the other hand, researchers have discovered that Journals are one of the most commonly used research tools (Pancheshnikov, 2007; Rethlefsen, 2007; Williams & Fletcher, 2006). The implication is that citation analysis can be used to rank, evaluate and categorize journals based on their frequency of article citation. It can help identify areas of weakness within a collection (Rethlefsen, 2007) inasmuch as it has its limitations it is an effective tool for ranking journals. Citation analysis is based on the assumption that documents cited by a researcher have been used in the research process. Consequently, this approach helps clarify both the information needs of researchers and what should be contained in a research library collection. Major use of citation analysis pertinent to collection evaluation include identifying the core collection, using citation as a check list, ranking journals and analyzing a disciplines structure to assist collection development decision making (Waugh,2004) .

On ranking, Bradford (1948) in his classic article published his law of scattering where he propounded that if scientific journals are arranged in order of decreasing productivity of articles,

in a given subject, they may be divided into a nucleus of periodicals more 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 and succeeding zones will be a 1: n: n<sup>2</sup> ..... Bradford was concerned with duplication of efforts in scholarly publications. In his study, 300 abstracting and indexing journals captured 750,000 articles each year and only 250, 000 of them were dealt with, missing 500,000. A statistical analysis was therefore carried out and the result revealed three rough zones or groupings which he graded as those producing more than four references a year; those producing more than one but not more than four a year and those producing one or less than one a year. This statistical analysis is the theoretical basis of his law of scattering. Drott (1981) noted that the law begins with a regularity which is observed in the retrieval or use of published information. This regularity according to him is characterized by both concentration and dispersion of specific items of information over several sources of information.

The implication is that for a search on a particular item of information, a large percentage of relevant articles will be concentrated on a small number of journal titles while the rest will be dispersed over a large number of titles. The law explains that a small core of journals has as many papers on a given subject as a much larger number of journals 'n' which again has as many papers on the subject as 'n<sup>2</sup>' journals. The law does not however claim that scattering is the same from one subject to another. The belief is that 'soft' disciplines such as humanities field will be more scattered than 'hard' disciplines (Meadow cited in Hjørland, 2007).

Bensman (2005) reveals that Bradford's law is used to solve problems in journal collection management as well as resource development in many libraries. The basic concept is to conduct Bradford analyses of journals. That is, to sort the journals in Bradford zones and thus identify which belong to the core and which does not. He reveals that any Bradford analysis involves three steps:

- i. Identify many or all items (usually articles) published in this field;
- ii. List the sources (usually journals) that publish the articles (or items) in rank order beginning with the source that produces the most items;



- iii. While retaining the order of the sources, divide this list into groups (or zones) so that the number of items produced by each group of sources is about the same.

While Garfield (1977) in his constant theory postulates that the references processed each year have a ratio of constant, with the number of different items cited by those references. He however, remarked that as the number and types of journal covered increased, the ratio changes slightly. Mathematically, Garfield's constant is the product of growth rate and number of references per paper divided by the utilization factor ( $C = GR/U$ ) where  $G$  = Growth rate;  $R$  = number of references per paper and  $U$  = Utilization factor and  $C$  = Constant. This means that a field like biochemistry will produce a larger number of papers whose citation frequency exceed 400 or 500 citation reaching to what Garfield (1998) called citation classic.

### **3.0. Methodology**

In this study Masters Theses of Library and Information Science submitted from 2010 to 2019 to the Main Library, Nnamdi Azikiwe University, Awka, Nigeria were examined. Citations were extracted from the title pages and reference lists of each of the thesis were examined. Each thesis's title page and reference section were photocopied and the data was feed into the SPSS package for analysis. Data extracted included the year the materials were submitted, title of the thesis, author, and year of acceptance, format of material cited, date of publication and name of cited journal. The material cited were categories as; journals, books, conference proceedings, reports including working papers, research paper, annual reports, and technical reports, theses and dissertations, web resources, government publications and miscellaneous (which includes year books, newspapers, manual, bulletins, guide, newsletters, magazine, personal communications, unpublished materials, and other). Data obtained from forty-eight (48) masters' theses were examined. The data extracted were analyzed using descriptive statistics which includes frequency and percentage presented in tables and figures.

#### 4.0. Presentation and Analysis of Data

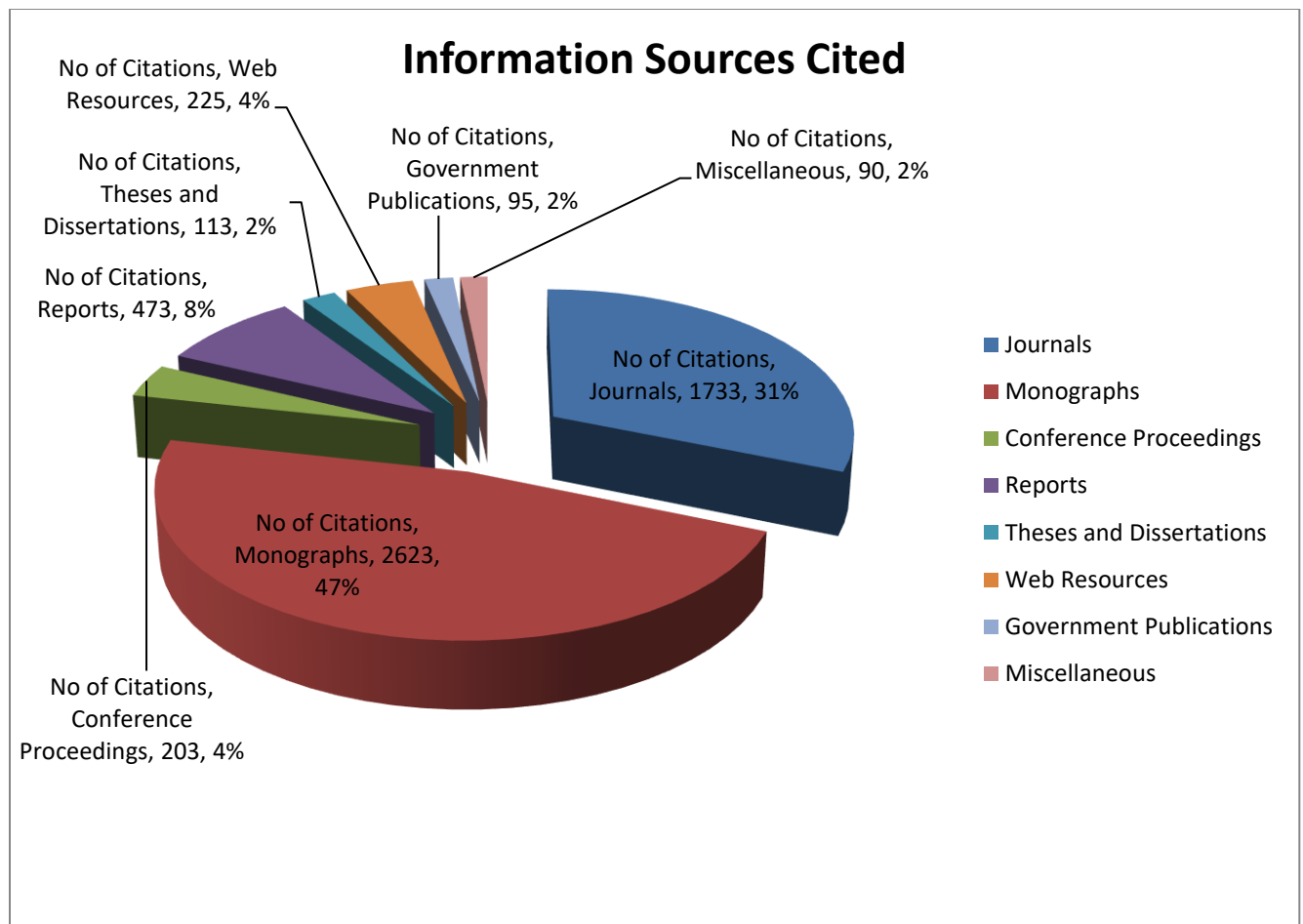
The results were presented based on the objectives of the study which include the type of resources the students cited, the age of citations with reference to the year the theses were published and the most cited journals by the students. From Forty-eight (48) masters' theses, five thousand five hundred and fifty-Five (5555) citations were found. In this process, every reference made at one time has been counted as one citation.

For effective analysis, materials identified as cited from the theses were grouped into eight categories: journals, books, conference proceedings, reports including working papers, research paper, annual reports, and technical reports, theses and dissertations, web resources, government publications and miscellaneous (which includes year books, newspapers, manual, bulletins, guide, newsletters, magazine, personal communications, unpublished materials, and other).

Research question 1: What type of information resources were cited by Masters Students in Library and Information Science theses?

**Table 1: Citations by Information Materials Type**

S/N	Material type	No of Citations	Percentage (%)	Cumulative %
1	Journals	1733	31.21	31.21
2	Monographs	2623	47.22	78.43
3	Conference Proceedings	203	3.65	82.08
4	Reports	473	8.51	90.59
5	Theses and Dissertations	113	2.03	92.62
6	Web Resources	225	4.05	96.67
7	Government Publications	95	1.71	98.38
8	Miscellaneous	90	1.62	100
	Total	5555	<b>100</b>	



**Figure 1: Types of Information Sources Cited**

As indicated in the table 1 and figure 1 above, 47.22% representing 2623 of the total citations of 5555 were monographs. While 31.21% or 1733 were journals. Other are: reports – 8.51% or 473 citations, web resources, 225 citations or 4.05% and theses and dissertations – 2.03% or 113 citations among other cited information materials.

**Research Question 2:** What were the ages of information resources cited in relation to the years the theses were published?

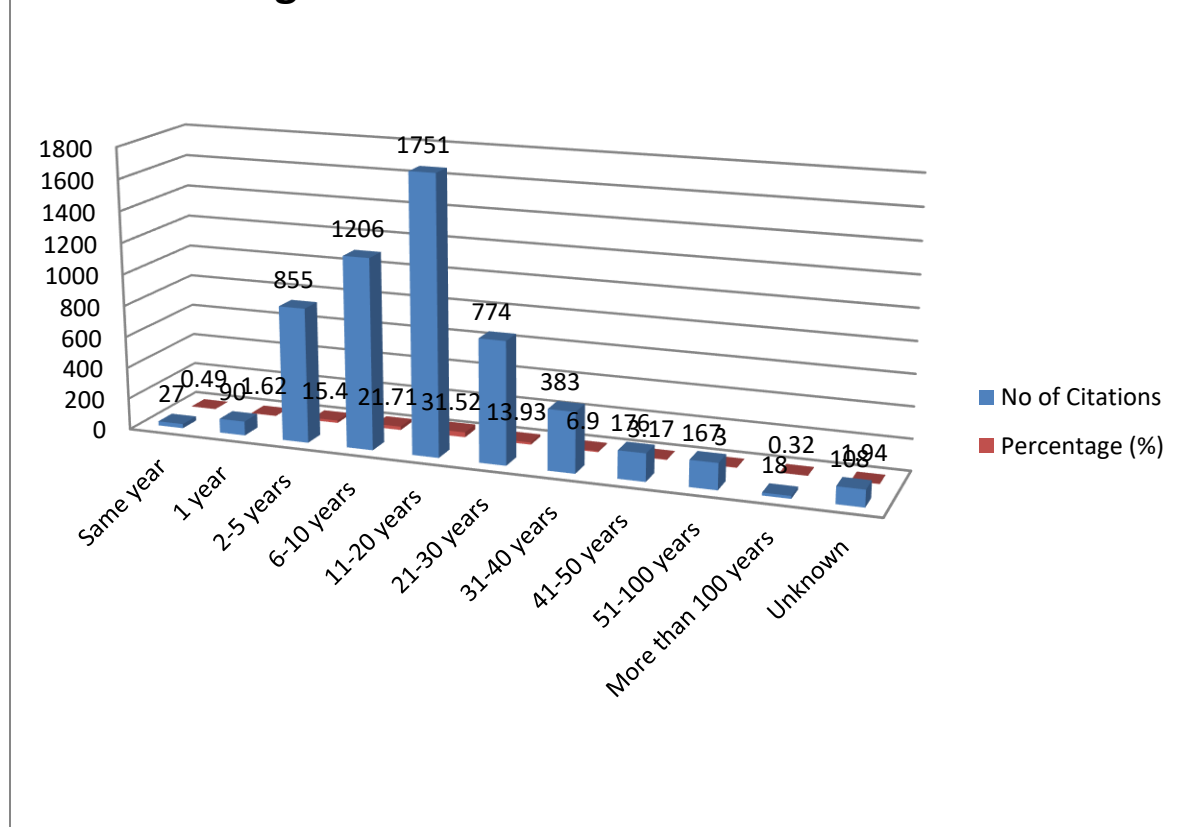
**Material Age**

Rather than simply analyzing publication date. In the current study, percentages were used to describe items to make the data more meaningful. Figure 2 shows the percentages of age of cited materials by master students in library and information science.

<b>No of Years</b>	<b>No of Citations</b>	<b>Percentage (%)</b>	<b>Cumulative %</b>
<b>Same year</b>	<b>27</b>	<b>0.49</b>	<b>0.49</b>
<b>1 year</b>	<b>90</b>	<b>1.62</b>	<b>2.11</b>
<b>2-5 years</b>	<b>855</b>	<b>15.4</b>	<b>17.51</b>
<b>6-10 years</b>	<b>1206</b>	<b>21.71</b>	<b>39.22</b>
<b>11-20 years</b>	<b>1751</b>	<b>31.52</b>	<b>70.74</b>
<b>21-30 years</b>	<b>774</b>	<b>13.93</b>	<b>84.67</b>
<b>31-40 years</b>	<b>383</b>	<b>6.9</b>	<b>91.57</b>
<b>41-50 years</b>	<b>176</b>	<b>3.17</b>	<b>94.74</b>
<b>51-100 years</b>	<b>167</b>	<b>3</b>	<b>97.74</b>
<b>More than 100 years</b>	<b>18</b>	<b>0.32</b>	<b>98.06</b>
<b>Unknown</b>	<b>108</b>	<b>1.94</b>	<b>100</b>
<b>Total</b>	<b>5555</b>	<b>100</b>	

**Table 2: Age of cited materials**

## Age Distributions of Cited Materials



In calculating the citation age, the difference between the date of the citation and the date of the publication in which it was cited considered. As indicated in the table 2 and figure 2, 39.21% of materials cited were published within the last 0 - 10 years old. It further revealed that 31.52% of materials were within 11 - 20 years and 13.93% or 774 of materials were within 21 - 30 years while from 31 – 100 years materials were cited 726 times or 13.07% with above hundred years and undated materials having 116 citations representing 2.09% of the total citations.

**Research Question 3:** Which were the most frequently cited journal titles in the theses?

### Ranked List of Journals

Journals are essential for research, but due to the ever increasing demands for the journals librarians are struggling to select most relevant titles by studying the quality, usefulness and suitability to particular group of users. The ranking list of journals is a practical tool that helps librarians to select journals of maximum utility in relation to their coverage of new and important

literature in a particular subject area. In the present study, citation analysis has been used for preparing rank list of journals in the discipline of Library and Information Science.

Table 3: List of Journal titles under zone 1 based on Bradford law of scattering

S/N	Journal Name	No of Citations	Cumulative	Rank
1	Library Philosophy and Practice (e-journal)	140	140	1 <sup>st</sup>
2	African Journal of Library, Archives and Information Science	70	210	2 <sup>nd</sup>
3	The Journal of Academic Librarianship	51	261	3 <sup>rd</sup>
4	Journal of Library and Information science	47	308	4 <sup>th</sup>
5	IFLA Journal	45	353	5 <sup>th</sup>
6	College and Research Libraries News	41	394	6 <sup>th</sup>
7	International Journal for Digital Library Services	41	435	6 <sup>th</sup>
8	Journal of Education for Lib & Info Sc	39	474	8 <sup>th</sup>
9	The Electronic Library	38	512	9 <sup>th</sup>
10	Library Herald	36	548	10 <sup>th</sup>
11	South Africa Journal of Library and Information Science	36	584	10 <sup>th</sup>
12	The Information Technologist	33	617	12 <sup>th</sup>
13	Annals of Library and Information Science	33	650	12 <sup>th</sup>
14	Library and Information Science Research	33	683	12 <sup>th</sup>
15	Journal of the Nigerian Library Association	33	716	12 <sup>th</sup>
16	Nigerian Library Link	32	748	16 <sup>th</sup>
17	International Information and Library review	32	780	16 <sup>th</sup>
18	Journal of Librarianship	32	812	16 <sup>th</sup>
19	New Library World	32	844	16 <sup>th</sup>
20	International Journal of Librarianship and Administration	31	875	20 <sup>th</sup>
21	Library Management	30	905	21 <sup>st</sup>

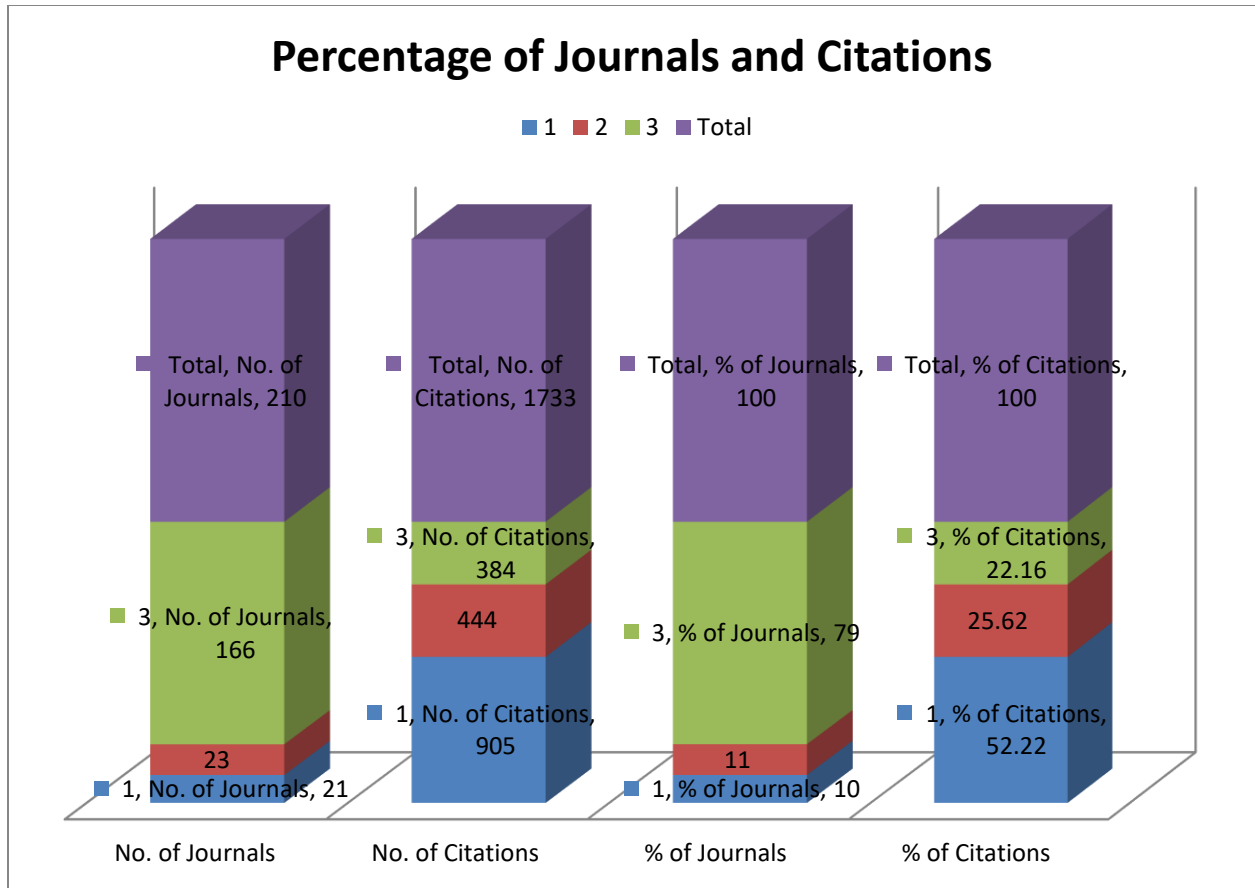
Table 4: List of Journal titles under zone 2

S/N	Name of Journal	No of Citations	Cumulative	Rank
1	Education for Today	28	28	22 <sup>nd</sup>
2	Reading and Writing Quarterly	28	56	22 <sup>nd</sup>
3	International Journal of Recent Scientific Research	27	83	24 <sup>th</sup>
4	Journal of Applied Information Science and Technology	25	108	25 <sup>th</sup>

5	Journal of Education and Practice	25	133	25 <sup>th</sup>
6	International Journal of Educational Science	24	157	27 <sup>th</sup>
7	Journal of Research and Reading	24	181	27 <sup>th</sup>
8	Information and Knowledge Management	20	201	29 <sup>th</sup>
9	International Reference Research Journal	20	221	29 <sup>th</sup>
10	Journal of Educational Psychology	20	241	29 <sup>th</sup>
11	American Educational Research Journal	19	260	32 <sup>nd</sup>
12	Journal of Organizational Behavior	19	279	32 <sup>nd</sup>
13	Journal of Knowledge Management	18	297	34 <sup>th</sup>
14	Journal of Management	16	313	35 <sup>th</sup>
15	South Africa Journal of Industrial Psychology	16	329	35 <sup>th</sup>
16	Journal of Business Management	16	345	35 <sup>th</sup>
17	Journal of Management Studies	15	360	38 <sup>th</sup>
18	South African Journal of Information Management	15	375	38 <sup>th</sup>
19	Journal of Agricultural Extension	15	390	38 <sup>th</sup>
20	European Journal of Scientific Research	14	404	41 <sup>st</sup>
21	American Journal of Information and Technology	14	418	41 <sup>st</sup>
22	World Journal of Computer Appreciation and Technology	13	431	43 <sup>rd</sup>
23	Journal of Humanities and Social Sciences	13	444	43 <sup>rd</sup>

**Table 5: Percentage of journals and citations in each Bradford Zones**

Zone	No. of Journals	No. of Citations	% of Journals	% of Citations
1	21	905	10	52.22
2	23	444	11	25.62
3	166	384	79	22.16
Total	210	1733	100	100



**Figure 3:** Distributions of Number of Journals and Citations in Percentage

The data in tables 3 to 5 and figure 3 above showed the number of citations in masters theses based on Bradford law of scattering ranking of journals. The rankings were in 3 zones with zone one (1) having 21 journals but with the highest citations of 905 or 52.22% of the total citations coming from 10% of the whole journals of 210, while zone two (2) produced 444 citations from 23 journals representing 25.62% of the total citations and zone three (3) housing 166 journals producing 384 citations or 22.16% of the total citations of 1733.

## 5.0. Discussion of Results

The result of this study as analyzed in table 1 and figure did reveal that of a total of 5555 citations, monograph produced the highest number of citations with 2623 representing 47.22% followed by Journals with 31.21% or 1733 citations before others like reports, web resources, theses and dissertations, conference proceedings and government publications among others. The outcome of this study is contrary to those Rieb (1993); Kim (2002); Kushkowsky et al. (2003);



Musser and Conkling (1996) who their separate studies reported that journals were the most cited type of information materials by researchers, with other format varying widely.

The study also discovered that 39.21% of materials cited were published within 0 - 10 years old while 31.52% of materials were within 11 - 20 years. In this case, it was discovered that most of the cited materials that were within 10 or under 10 years were journals. This indicates that postgraduate students prefer current journals to the old while monographs citations were noticed to have occupied the later age range of 11 years and above. This situation may be attributed to the fact that monographs are not published as continuum as in the case of journals and form better sources for background information while journals are preferred for current and up-to-date information on any chosen topic of research. The analysis of citations by age of cited documents therefore reveals useful life of documents popularly referred to as half life of periodicals or often quoted as obsolescence of use of literature (Shafi, 2001) On the other hand, understanding the extent to which library users rely on older materials can be useful in determining which materials can be moved to remote storage (Ackerson 2001). This result may not be in agreement with the finding of Musser and Conkling (1996) and Kushkowsky et al. (2003) who in their separate studies discovered that the majority of materials cited by graduate students in their research works were less than eight years old.

The result of study further shows that majority of the journal citations which stood at 905 came from journals classified under zone one of Bradford's law of scattering which covers only 10% of the journal titles. Journals in the first and second zones all together produced 1349 or 77.84% citations in 44 journals. The remaining 79% of journals titles were cited either 2 times or once, The second zone contained 444 citations in 23 journal titles (See table 5) and the third zone had the remaining 166 journal. This implies that majority of the journal titles (n:116=79%) had either one citation or two citations. From this result, one has no choice than to agree with Bensman (2005) who reveals that the application of Bradford's law of scattering in ranking of journals helps in solving challenges in journal collection management as well as resource development in libraries.

Garfield (1977) suggested that rankings developed from total citation counts could be a variable in developing core journal lists. However in the present study, the rank list of journals in the field of Library and Information Science reveals that journal citations cited by researchers are scattered among 210 journals. Among them, Library Philosophy and Practice (e-journal) ranked the first for being cited more number of times with 140 (8.08%) of total journal citations of 1733, followed by African Journal of Library, Archives and Information Science -70 (4.04%) then Journal of Academic Librarianship 51 (2.94%) (See table 3). The first 21 journals in the rank list contribute nearly 33% of total journal citations. The first 44 journals in the rank list contribute nearly 71% of total journal citations. These 44 journals may be deduced as mostly used journals by the Library and Information Science researchers. According to Bradford (1927) Law of scattering, the 21 journals in zone one are considered as core journals followed by those in zone two (See table 3 to 5 and figure 3).

## **5.1. Conclusion and Recommendation**

This study analyzed 48 Masters Theses on Library and Information Science which were submitted to Prof. Festus Nwako Library, Nnamdi Azikiwe University, Awka, Nigeria during the period of 2011 to 2018. The study discovered that majority of the cited sources were monographs covering 47.22% of the total citations in Library and Information Science theses within the eight (8) year period of study and closely followed by journal with 31.21%. From the outcome of the study, it is deduced that the average age of materials cited in Library and Information Science Masters theses were between 1 – 20 years. While journals were cited for their recency and current information content, monographs were seen as better source for conceptual studies and background information. It was further discovered that most journals cited in the reviewed theses fall within zone 1 and 2 based on Bradford's law of scattering and are known as the core journals while Library Philosophy and Practice (e-journal) was ranked first being the highest cited journal title.

In the area of collection development, the deduction based on the findings of this study is that by examining the age of the cited references, data can be used to develop storage and retention policies of the library. This type of study is also useful in identifying the core journals which are needed for research in library and information and science. Going by the findings of this study,

the further conclusion is that identified core journals such as Library Philosophy and Practice, African Journal of Library, Archives and Information Science and other core journal as displayed in table 3 are very crucial for postgraduates researches in Library and Information Science not only in Nnamdi Azikiwe University, Awka, but to other universities in Nigeria offering library and information science.

In view of the findings the following recommendations are hereby made:

- I. University librarians should apply citations analysis of theses in selection and deselecting of materials in the libraries;
- II. Librarians should apply the examinations of age of cited references to help develop storage and retention policies vis-à-vis developing collection development policies and budget planning;
- III. As a matter of professional responsibility, university librarians should ensure annual citations of theses submitted by every department with a view to ascertaining the actual information materials desired by postgraduate students in carrying out their researches;
- IV. The university librarians should ensure proper documentations of all theses submitted to the library year by year. This has become imperative as one can hardly get to any library in Nigeria and easily access these theses without being faced with the challenge of uncertainty of the way about of the theses,
- V. It is a common notice of missing or mutilated theses in Nigerian University libraries. To this end, library management should come up with modern electronic security gadgets for dictating students who intend to go away with library materials as well as mounting CCTV cameras in libraries for monitoring students' activities.
- VI. If bibliography is studied as one of the courses in library schools, there is no reason why Citation Analysis should not be made one of the courses to be offered starting from the undergraduate level. The emphasis is that library schools and library and information science curriculum planners should include Citation Analysis as one of the courses to be studied in library schools.
- VII. Students should be encouraged to carryout citations analysis researches in every field of study.

## 5.2. Implications of study

The outcome of this study has the following implications among many others:

- I. Analysis of citations data can be used to create core journal lists, which can be used to make collection decisions in support of research and teaching.
- II. Citations data may be used in developing core title lists of journals, selection of relevant monographs and other information materials which will assist librarians to maintain standard collections when flat or shrinking budget allocations require certain information materials cancellations especially journals.

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