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Citation Analysis of Postgraduate Students as a Measure of their Resource Preference

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Abstract

The study was designed to analyze citation of postgraduate masters' theses produced between the year 2000 and 2008 in the School of Agriculture and Agricultural Technology of Federal University of Technology Owerri with a view to determine their resource preference. It was undertaken as an update of similar study carried out in 2003 and 2004. Using checklist data contained thirty one (31) theses which were submitted in the University library between the year 2000 and 2008 were collated and analyzed using tables, graph, frequency count and percentages. The result revealed that: though the students cited monographs, journals , conference proceedings and; unpublished theses/ dissertations , newspapers, technical reports and newsletters, journals are cited most. The mean number of cited resources for each of the theses is 75.8 out of which 34.12% are journals hence, the students demonstrated preference for journal to other resources for research; current resources were not used by students for research since 53.23% of the resources cited were 20years older than the year the theses were produced; and the most preferred journal for research by the students was the Journal of Animal Production. Other journals which the students preferred for research included Journal of Science of Food and Agriculture, Agronomy Journal and Journal of Agriculture and Food Chemistry. Most of the preferred journals which were available in the Library had their subscription suspended before 1997. Recommendations were made based on the findings.

1. Introduction

The primary aim of university education is to engender teaching and research. The bedrock of this aim is the provision of information resources which students and faculty consult. Consulted resources referred to as literature are documented in the case of research as citations. Citations emanating from students' research reports, theses or dissertations form invaluable instrument for continuing provision of quality information resources especially for a university library collection development activities. (Anunobi, 2002). Though circulation and shelving data, cost per usefulness, interlibrary loan studies, reviews of core lists and citation analysis are used to determine collections' use by students in academic libraries, citation analysis serves as invaluable tool in the assessment of library collection (Smith 1981, Thomas 1993, Sylvia & Lesher. 1995 & Hycock, 2004). Citation analysis is also utilized in the understanding of: subject relationship, author effectiveness, publication trends and user behaviour (Curtis 2005, Chikate, Pahl & Library, 2008). Faculties employ citation analysis when: searching for journals to publish their research, locating important journals and weighing the influence of a particular journal in a discipline. Citation also reflects the relationship between the present work and previous ones (Olatokun & Makinde, 2009). It helps to justify supremacy and competitive position of authors and to identify usefulness of journals (Aina, 2006).

Citation analysis is of immense benefit to university libraries especially as they serve as custodians of information resources in the university. A library can determine its efficiency in responding to researcher demand using citation analysis (Broadus 1977, Sylvia 1998, Smith 2003, Leiding 2005). Proper collection development decisions are taking using citation analysis as it relates to journal selection, retention and cancellation in an event of reduced budgetary allocation to academic libraries (Bolgian & King1978, Marcer 2000 , Leiding2005,). Such documents will also be culled to support fiscal and other types of accountability such as developing formulae for serials and monograph ratio (Devin & Kelliogy 1990), as

well as in showcasing graduate research demand on library collection (Smith, 1981). Leiding (2005) emphasized that the use of citation analysis is of great importance to academic librarians who are new to selection in a particular discipline. But he warned that citation data alone is not enough to determine materials to be selected. In some cases as noted by Marinko (1998), dissertation citation analysis does not include all the sources during research and writing process. Further justification of citation analysis benefits to serials selection and cancellation in academic library against faculty preference is that faculty selections are always bias in their favour, since the faculties are not familiar in most cases with many journals available for research in their areas and they often resist cancellation of any serials (Waugh & Ruppel, 2004).

Literature is replete on the use of citation analysis for academic library collection development. Despite the availability of research reports on undergraduates' work citation analysis, postgraduate students' theses /dissertations are often preferred because they form a large percentage of user groups in most academic libraries utilizing tools and other library resources for research (Edwards, 1996). In affirmation to the above proposal, Anunobi (2002) found in her study that most of the citations from journals and monographs were credited to postgraduate students' theses/dissertations, contrary to the undergraduates' which had limited citations mostly as monographs. Again in a study, Zipp (1996) found that the citation of postgraduate studies research reports correlates positively with citation in faculty publication. In effect many studies have adopted citation analysis of postgraduate research in solving collection development and faculty publication decision problems. Using citation analysis, Curtis (2005) found that of the 2,639 resources cited in his study, 764 were cited during 1986-1995 research where most of the research is from 55 journals. In the study to determine resource preference among music librarians, Kuyper-Rushing (1996) found a uniform core journal titles citation among them. In most citation studies, journals are highly preferred than monographs (Devin & Kellogy 1990, Buchanan & Herubal 1993, Gooden 2001,Anunobi 2002, Beile, Boote & Killingsworth 2004, Leiding 2005, Fletcher & Williams 2006).

In the effort to determine citation scatter, Sylvia & Leisher (1995) found that the top twenty percent(20%) of journals cited in their study constitute sixty two percent(62%) of the entire citation contrary to the eighty over twenty percent rule of scatter. Eighty point eight percent(80.8%) of the citations in Thomas' (1993) study came from eighty percent(80%) of the total journal cited.

Though myriad of studies exist on citation analysis in libraries of which two have been carried out in Federal University of Technology Owerri, there is need for this present study. The previous citation analysis was a comparative study of citation preference of postgraduate and undergraduate students in the University (Anunobi 2002). It analyzed undergraduate research projects and theses / dissertations between 1986 and 1997; it was shallow with the study of all the Schools in the University and it did not consider the journal preference as well as their availability in the University library. Further study was carried out in 2003 to determine journal availability in the University library and their use by undergraduate students in the School of Agriculture and Agricultural Technology of the same University (Nwogu, Anunobi &Okorafor 2003). The study was geared toward de-selection and choosing the most relevant journal to subscribe for the School. However postgraduate research reports were not considered despite their importance in journal selection and cancellation decisions. As a follow up to the previous studies which are over ten years, the study was put in place. This is necessary as the Library strives to ensure that relevant resources are procured for students' research in the School. Hence the study sought to determine the resource preference of masters' students in the School of Agriculture and Agricultural Technology of Federal University of Technology Owerri, Nigeria. Specifically, it intends 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 produced;
3. Determine the journals preferred by of the students in the course of their research; and
4. Determine the preferred journals availability in the University Library.

2. Method

This is a descriptive survey which employed citation analysis to determine the resource preference of masters students of the School of Agriculture and Agricultural Technology in the course of their theses research. Citation analysis was carried out for all the masters theses produced between 2000 and 2008 in the School which were submitted to the University library. A total of thirty-one (31) masters theses were submitted to the Library at the time of this study as shown in Table 1. The School which was established in 1982 is one of the oldest Schools in the University. It has seven departments all admitting undergraduate and postgraduate students. The departments include: Animal Science and Technology, Crop Science and Technology, Agricultural Economics, Agricultural Extension, Soil Science Technology, Fishery and Aquaculture , and Forestry and Wildlife. At the time of this study theses produced in 2009 had not been received by the Library therefore was not made part of this study. Previous citation studies of thesis from the Faculty utilized earlier masters' theses.

All the resources consulted for each of the thesis which were documented as references were copied and data extracted with the aid of observation checklist. Results were presented with Tables, frequency counts, graphs and percentages.

Table 1: Number of Theses Produced in the School of Agriculture and Agricultural Technology for the Years Under Study

Year of Production	No. of thesis	% of Total
2000	4	12.90
2001	2	6.45
2002	5	16.12
2003	1	3.22
2004	2	6.45
2005	1	3.22
2006	10	32.25
2007	4	12.90
2008	2	12.90
Total	**31**	**100**

3. Results

The results were presented based on the objectives of the paper which include the type of resources the students cited, the age of citation with reference to the year the theses were produced, the most preferred journals by the students and the preferred journals availability in the University Library.

Types of Resources cited

The analysis revealed that a total of 2,350 citations were made in the 31 theses with the average citation of 75.80 per thesis. This consists of 21.06 %(495) monographs, 34.12 %(802) journal articles, 14.89 %(350) conference papers and 29.91 %(703) of other resources as shown in Figure 1. Other resources cited include newspaper/magazines, unpublished theses /dissertations, bulletins and newsletters, technical reports, websites, encyclopedia and dictionaries.

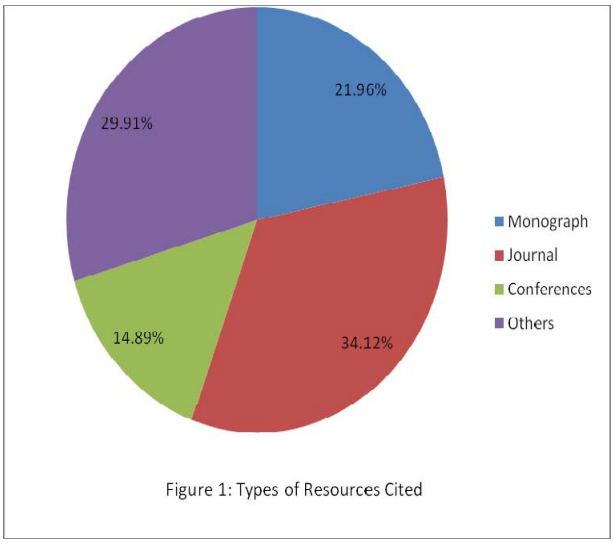


Figure 1: Types of Resources Cited

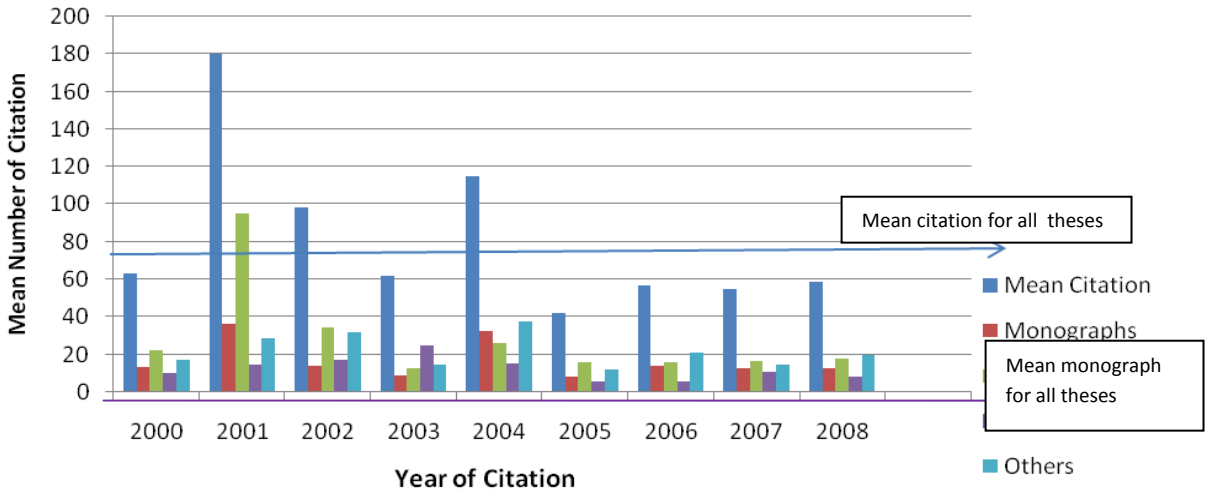
Table 2 further shows that the students cited journals most followed closely by other resources. Conferences and monographs were almost at the same level with each other. However, the mean score range of citation portrays great disparity in citation among the different theses.

Table 2: Distribution of Citations in the Theses.

Type of Resources	Mean % Citation	Range
Monographs	15.96	56
Journals	25.87	126
Conferences	15.97	32
Others	22.67	61

Citation distribution for the various years was sought. The result is presented in Figure 2. It shows that theses produced in 2001 had the highest average citation of 180.5 followed by 115 and 98.2 for theses produced in 2004 and 2002 respectively. Other years' theses revealed citation below the 75.80 mean citations for all the theses. Their mean citation ranges from 63.5 through 59 to 42 for 2000, 2008 and 2005 theses, respectively.

Again the highest mean monograph and journal citation of 36.5 and 95 were recorded in year the 2001. Other years show mean monograph citation below average citation for the entire theses which stands at 15.96 except the 2004 theses which has a mean monograph citation of 32.5. Theses produced in 2005 had a very worrisome poor mean citation of 8, 16, 6, 12 for monographs, journals, conferences, and other resources respectively. Contrary to the high monograph citation from 2001 theses, those of 2003 and 2004 had their highest cited resources as conferences (25) and other resources (37.5) respectively. Generally theses produced in 2001, 2002, and 2004 had their mean citation above the average for all the years.



Citation Distribution for Theses Produced during the Years Under Study

Age of Citations

The study sought to find how current the resources cited are in relation to the time the theses were produced. The result which is presented in Figures 3 and 4 are quite revealing. 53.23% of the citations in all the theses were over 20years of age. Furthermore, for each of the year of theses production, above 50% of its citations was over 20years of age except theses produced in 2003, 2005, 2006 and 2008 (Figure 4). Unfortunately 85.43% of cited resources in year 2000 were over 20years of age. Most current citation were found in theses produced in 2003 with 30.64% and 69.35% of their citations published within the age range of 1-5years and 6-19years respectively.

Though the age of citation of theses produced in 2008 were almost evenly distributed, it has its highest citation (38.97) produced over 20 years back. Theses of 2007 which are also of recent research had their highest citations produced over 20years ago.

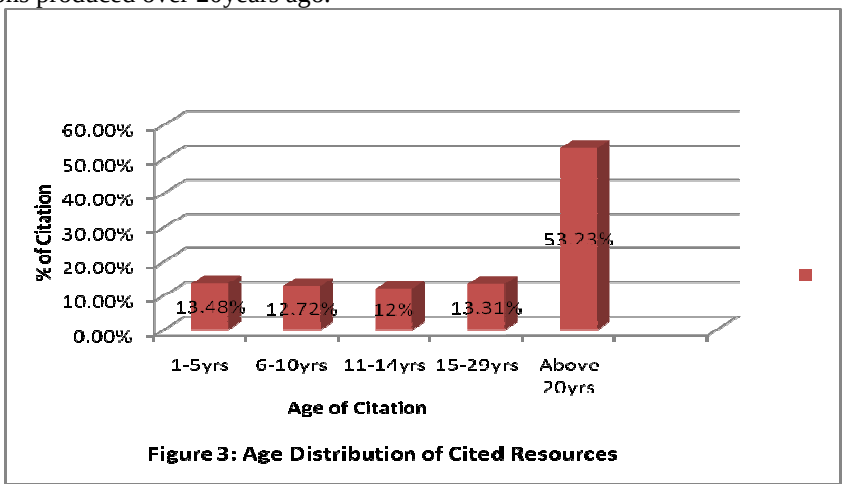


Figure 3: Age Distribution of Cited Resources

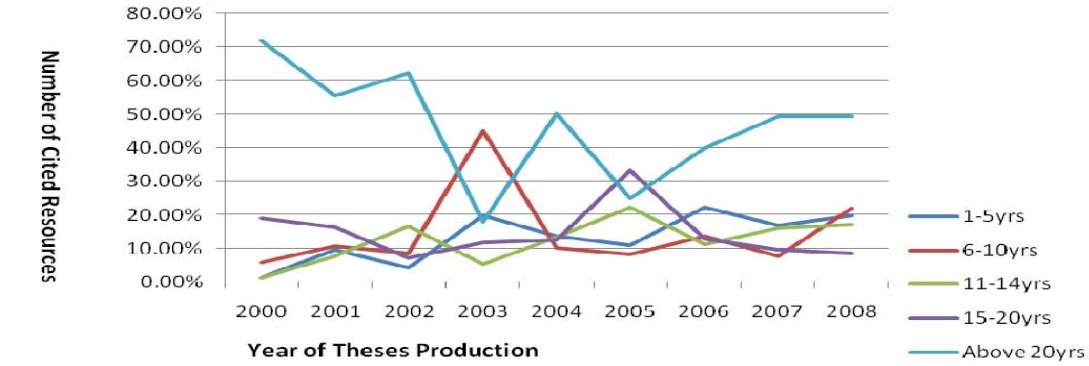


Figure 4: Age Distribution of Cited Resources in Relation to the Year of Theses Production

Journal Preference

The ten most cited journals in the theses were sought as a reflection of journal preference by the students. The result is presented in Table 3.

Table 3: The Ten Most Cited Journals by Postgraduate Student

S/N	Journal Title	Frequency of Citation	% of total Citation
1	Nigerian J. of Animal Production	54	6.73
2	Transaction of American Society of Agric. Engineers	36	4.48
3	Journal of Science of Food and Agriculture	33	4.11
4	Agronomy Journal	32	3.99
5	Experimental Agriculture	30	3.74
6	American Journal of Agricultural Economics	21	2.61
7	Journal of Agriculture and Food Chemistry	20	2.49
8	Tropical agriculture	20	2.49
9.	Animal Feed Science	18	2.24
10	Agricultural Administration	17	2.11
	Total	**281**	**35.04**

It shows that the most cited journal constituted 35.04%(281) of the total citation. This included one local journal: Nigerian Journal of Animal Production which attracted the highest percentage citation of 6.73% and other nine international journals . The international journals included Transactions of American Scociety of Agricultural Engineers, Journal of the Science of Food and Agriculture , Agronomy Journal, Experimental Agriculture and American Journal of Agricultural Economics. Other top ten journals were Journal of Agriculture and Food Chemistry, Tropical Agriculture , Animal Feed Science and Agricultural Administration.

Preferred Journal Availability in FUTO Library

The result of the preferred journal availability in FUTO Library is presented in Table 4. **Animal Feed Science and Agricultural Administration** are not contained in FUTO library subscription list. Others had their subscription opened in the 1980s' except **Nigerian Journal of Animal Production and Journal of Science of Food and Agriculture** . However their subscription were suspended in 2006 and 2003 respectively.

It is clear from Table 4 that any thesis produced from 1997 which may have cited the above journals may have consulted them outside FUTO library except Nigerian Journal of Animal Product and journal of Science of Food and Agriculture which current library issues are Vol.80(2006) and Vol 38(1995), respectively.

However, it was found that some of these journals namely Experimental Agriculture, and American Journal of Agricultural Economics are part of those provided for online access through **Access to Global Online Reseach in Agriculture(AGORA**). But it is doubtful if the resources were consulted electronically since no web address was provided at the reference area.

Table 4: Preferred Journal Availability in FUTO Library

S/N	Journal Title	Subscription	1st Subscription	Currnt issue in Library
1	Nigerian J. Animal Production	Print	Vol 40(1999)	Vol 802006)
2	Transaction of American Society of Agric. Engineers	Print	Vol (29)1986	Vol 38(1995)
3	Journal of Science of Food and Agriculture	Print	Vol 33(1988)	Vol 83(2003)
4	Agronomy Journal	Print	Vol78(1986)	Vol 88(1996)
5	Experimental Agriculture	Print	Vol33(1990)	Vol 38(1996)
6	American Journal of Agricultural Economics	Print	Vol40(1988)	Vol43(1991)
7	Journal of Agriculture and Food Chemistry	Print	Vol30(1982)	Vol44(1996)
8	Tropical agriculture	Print	Vol63(1986)	Vol73(1996
9	**Not Subscribed to**			
10	**Not Subscribed to**			

4. Dicussion of Findings

It could be affirmed that the average citation of postgraduate students in the School of Agriculture has improved drastically from the mean of 38 recorded with theses produced between 1986 and 1997(Anunobi ,2002) and the present result of 75.80 average.Though this could be attributed to more indept literature search by the students or increased availability of information resources for research but the mean citations for years 2004,through 2006 to 2008 fall below that average and do not demonstrate increase in citation.

The revelation that journals are used more than other resources is consistent with the findings of other research on citation analysis as indicated by Buchanan & Herubel (1993), Anunobi (2002), Beile, Boote & Killingsworth (2004), Leiding (2005), and Fletcher & Williams (2006). Furthermore, there is sharp increase in the mean citation from 19.06 for theses produced between 1991 and 2000 (Anunobi, 2004) to 25.87 for theses of the present study (2000-2008).

It was not possible to find the explanation for the consistently low citation across all resources for theses produced in 2005. This could be a pointer to literature insufficiency in the research areas engaged by students in 2005 . Of necessary remark is the inconsistent reduced mean citation from 2005 to 2008. It

is likely that students are becoming less committed to their research as years go bye. Despite the large mean range of 126 in the number of journals cited, there is no significant variation in the mean journal citation for theses produced in years 2000, 2004 and 2008. This is understood since their mean journal citation include 22.5, 26 and 18 respectively.

It is worrisome that all the theses have their citations 20 years older than the theses. It is possible that the library resources are old and new resources are not provided or the students do not engage in indept literature search. The latter could hold as the Library subscribes to online databases (Resaerch4life) which provides a wide range of agricultural journals. Though the Library may not have provided all the needed resources, the availability of 2006 issues of some preferred journals demonstrates that current and relevant literature is still available in the Library.

There is a drop from 40.74% citation from 10 most cited journals of undergraduate students report between 1987 and 1999(Nwogu, Anunobi&Okorafor 2003) to 35.04% from 10 most cited journals in the present study. This is also contrary to 80/20 percent rule of scatter, where 80% of the total citation is expected from the 20 most cited journals. The result which shows **Nigerian journal of Animal Production** as the most prefered journal is consistent with the findings in similar study by Anunobi(2004) . This continued preference could be attributed to it being readily availability as local journal. Other journals that are consistently of immense importance to the students thereby appearing also in the previeous study by Anunobi (2004) include **Journal of Science of Food and Agriculture**, **Agronomy Journal** , **Journal of Agriculture and Food Chemistry** . It implies that in this era of dwindling finances, a decision to select most important journals for the School of Agriculture in the University will consider these journals first .

Library low satisfaction of research information needs of the students is revealed in the unavailability of the two most cited journals in the library subscription as well as the non –subsription to current issues of these journals by the Library whereas they are not available in the Research4life databases. There is no doubt that financial constraint is the reason. However this is an improvement from the previous research by Anunobi (2004) where only three of the most cited journal in PhD dissertations is avaliable in the Library.

5. Summary of Findings

The importance of bibliometric analysis using citation of students' theses cannot be over emphasized. Despite previous studies on the subject in the University library , the value of the present study is immense. It has thrown further light on the resources students use , their preference and the extent to which the library satisfies their needs. The research brought to the fore the following:

Though the students cited monographs, journals , conference proceedings and; unpublished theses/ dissertations , newspapers, technical reports and newsletters, journals are cited most. The mean number of cited resources for each of the theses is 75.8 out of which 34.12% are journals. Hence, the students demonstrated preference for journal to other resources for research;

Most of the resources (53.23%) cited were 20years older than the theses;

The most prefered journal for research by the student was the **Journal of Animal Production**. Other journal which the students prefered for research included **Journal of Science of Food and Agriculture**, **Agronomy Journal and Journal of Agriculture and Food Chemistry**; and Though all the preferred journals except **Animal Feed Science** and **Agricultural Administration** were avaialble in the University Library, most of them had their subscription suspended before 1997.

6. Conclusion

- From the findings on the citation analysis of postgraduate students of the School of Agriculture and Agricultural Technology, Federal University of Technology Owerri, the following conclusions were made:
- That though the students cited monographs, journals, conference proceedings, unpublished theses/dissertations, newspapers/magazine, technical reports and newsletters, 34.12% of the citations were journals;
- That current resources were not used by students for research since 53.23% of the resources cited were 20years older the year the theses were produced;
- That **Journal of Animal Production , Journal of Science of Food and Agriculture , Agronomy Journal ,**and **Journal of Agriculture and Food Chemistry** were very crucial for postgraduate students research in agriculture in the University; and
- That current issues of journals preferred by students for research were not avaialble in the University Library.

7. Recommendations

Based on the findings, the following recommendations are made:

1. Research students should be encouraged to step up their literature citations by using resources beyond their libraries;
2. Library of the Federal University of Technology Owerri should consider deselecting majority of Agricultural journals in their list and concentrate on the preferred journals identified;
3. The Library should sensitize research students to avail themselves of resources avaialble freely in the Resaerch4life databases;
4. Any library collection develeopment staff building new agricultural collection should give the five preferred journals prime consideration.

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