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Pioneer Bachelor Degree: Citation Analysis of Covenant University Students' Research Projects

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Introduction

One popular method of research in library and information science is citation analysis. Citation analysis is an aspect bibliometrics, and studies reference to and from documents (Diadoto, 1994, cited in Gooden, 2001). According to Aina (2002), citation analysis is a research method in which references cited are statistically analysed to find what journals are cited by researchers in a particular discipline.

The benefit of bibliometrics and citation analysis is expressed by Van Raan (2003), which is reinforced by the studies (Glenn, 1995; Lal and Panda, 1996; Okiy, 2003 and Aksnes, 2006) that have used this method of research enquiry to evaluate a library collection. Bibliometric studies have provided insight into emerging and obsolescent areas of research by investigating those resources or materials that are used regularly. This technique has also been employed to unobtrusively determine which resources students at any level are using to conduct research for their projects and dissertations (Gooden, 2001 and Megnigbeto 2006). This study adds to that literature by analysing the citations in the research project reports of the pioneer Bachelor degree graduands that have been submitted to the Covenant University library.

Covenant University is the foremost private University in Nigeria according to the National University Commission's (NUC) ratings of 2005. Its 16 academic programmes are all fully accredited by NUC in 2001, and the university has a mission of producing credible new leaders for Africa. The University Library, also called Centre for Learning Resources, is among the best university libraries in Africa, judging by its collections and its implementation of information technology for all services. The library serves the staff and students of the

University's three colleges: Business and Social Sciences, Human Development, and Science and Technology. The Center for Learning Resources also provides access to numerous online databases and catalogues.

In July 2006, 724 students formed the university's first graduating class. These pioneer bachelors degree students had all submitted a research project report to their departments, with a copy deposited with the university library. This study analyses the citations in these research reports, the goal of helping the library determine which materials and resources are heavily used and which materials are needed to improve the collection.

Objectives of the Study

- The objectives of this study are to:
- Analyse the type of cited materials
- Find the average citations made per project report
- Determine the amount of internet or e-resources cited
- Ascertain the recency of citations

Literature Review

According to Kostoff (1998), the usefulness of citation analysis is in measuring research impact or quality. It is not surprising therefore, that many researchers have used this method for evaluation purposes. A citation analysis of undergraduate term papers from Cornell University (Davis and Cohen, 2001) reveals a significant decrease in the frequency of scholarly resources cited between 1976 and 1999. Book citations decreased from 30% to 19%, newspapers citations increased from 7% to 19%, and web citations increased from 9% to 21%. A related study which examined 33 undergraduate student papers presented at a symposium (Kraus, 2006) revealed that there were a total of 770 citations, of which 76.2% came from journals, 16.4% from books or book chapters, and only 1% from websites.

Megnigbeto (2006) studied the citations of dissertations of library and information science undergraduate students and found that the number of citations to Internet resources was very low, while Davis (2002) examined the effects of the web on undergraduate citation behaviour. Ogunleye (1996) used the same method to study science project reports accepted by a Nigerian university.

Other studies have analysed the citations of doctoral dissertations or masters theses. Such works include Tunon and Brydges (2005) which used citation analysis to mine the reference list of doctoral dissertations as an assessment of the Nova Southeastern University 's doctoral students' research skills. This particular research was built on earlier studies, including Beile, Biote, and Killingsworth (2003) and Haycock (2004).

Gooden (2001) did a citation assessment of doctoral dissertations accepted at the chemistry department of Ohio State University and reported that journal articles were cited more frequently than monographs and other sources. Kushkowski (2003) conducted a longitudinal study of over 9,100 citations from 629 masters and doctoral theses and found that authors favour current researches regardless of discipline.

Citation analysis can also be used to find the extent of co-authorship or co-operation among researchers in a field. Ding, Foo, and Chowdhury (1999), for example, reveals an

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upward trend in collaborative information retrieval research, and Meyer and Spencer (1996) studied non-library science authors who cited articles in library and information science journals. Melin and Persson (1998), Katz (1994), Kadiri (2001), and Acedo (2006) have conducted similar studies.

Harter (1998) used citation analysis to investigate the effect of electronic journals on scholarly communication and found that the impact at Indiana University was minimal. This study followed on an earlier work (Harter and Joon Kim, 1996). Luwel, Noyons, and Moed (1999) evaluated scientific research at a Flemish university and other publicly- funded research and discovered that results were useful for policy makers and also policy debates.

Raptis (2006) evaluated authors' characteristics in five international journals using citation analysis. Estabrooks, Winther, and Derksen (2004) analysed the use of research literature in nursing, while Glanenzel and Schoep (1999) studied the reference literature in the sciences and social sciences in Germany

Results and Discussion

Type of Cited Materials and Average Citations in each Project Report.

The 557 research project reports generated a total of 14, 655 citations, an average of 26.3 citations per report. Table 1 below shows the type of materials cited.

Table 1. Sources of Cited Materials

Sources of citation	Citation counts	Percent	Rank order
Books	7802	53.3%	1
Journals	3687	25.1%	2
Internet / e-resources	1138	7.7%	3
Newspapers	583	3.9%	4
Conference proceedings	542	3.7%	5
Unpublished project/ Dissertation	504	3.4%	6
Grey Literature	399	2.7%	7
Total	14,655	100	

Fig. 1 Type of cited materials

Type of cited materials
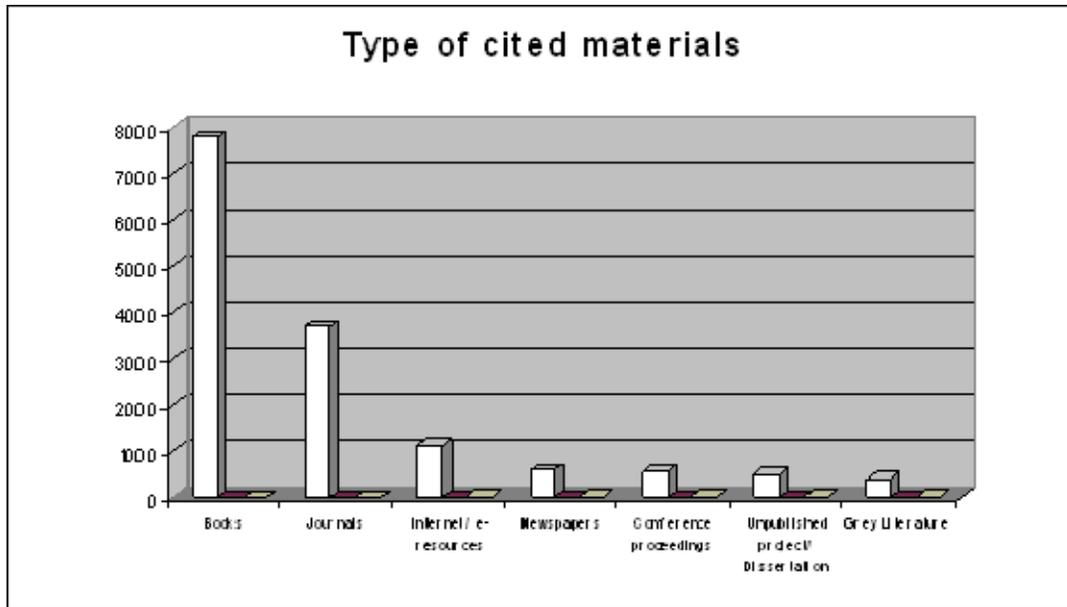
The table and chart above indicate that books were cited most frequently (53.3%), followed by journal citations (25.16%), Internet/e-resources (7.7%), newspapers (3.9%), conference proceedings (3.7%), unpublished research project / dissertations (3.4%), grey literature, which includes monographs, pamphlets, and unpublished papers (2.7%). This finding is in line with Ogunleye (1996), however studies such as Kraus (2002) and Gooden (2001) reported that authors cited more journals than books. The gap between book and journal citation reflects the fact that library's book collection is current and that students of this level do not yet appreciate the usefulness of journals for research.

Internet/e-resources Citations

The total number of internet /e-resources citations is 1138 or 7.7% of the total citations. The impact of internet/e-resources citations on research reporting by the authors was minimal. This is in agreement with the findings of Harter (1998) and Megnigbeto (2006) who reported similar results in a citation analysis of Internet resources. It might also indicate that there may be problems with Internet access and that information literacy skills may be deficient. It could also be a case of "cut and paste," without proper acknowledgement of web-based materials.

Recency of Cited Materials

A citation that falls within the year 2001-2006 is regarded as very recent, 1996-2000 as recent, 1990-1995 not very recent while citations from 1989 and below are classified as not recent.

Table 2. Recency of citations

Year	Recency	Citation count	%	Rank
2001-2006	Very Recent	5,357	36.5	1
1996-2000	Recent	4,032	27.5	3

1990-1995	Not Very Recent	4,054	27.6	2
1989 and below	Not Recent	1,214	8.3	4
Total		14,655	100	

5,357 or 36.5% of the total citations were *Very Recent*, 27.5% or 4,032 citations were *Recent*, while 27.6% or 4,045 citations were *Not Very Recent*. Only 8.3% of the total citations were *Not Recent*. The supervisors of these reports had presumably worked closely with the authors to ensure that recent materials are given preference in the citations.

Table 3. Citation by College

College	Citation Count	Percentage	Rank
CBS	7776	53.1	1
CHD	3993	27.2	2
CST	2886	19.7	3
TOTAL	14655	100	

The college of Business and Social Sciences and the College of Human Development, respectively, produced the most citations. The disciplines in these colleges rely more on voluminous and diverse literature. College of Science and Technology houses disciplines which are more inclined to numeracy, concrete product design and development. The practical base of that college tends to produce fewer citations, since an elaborate literature review is not their tradition.

Table 4. Highest and Lowest Citations by Individual Projects

College	Highest 3	Lowest 3
CBS	52, 42, 38	11, 13, 15
CHD	94, 55, 35	12, 14. 16
CST	36, 32, 24	6, 9, 10

The highest individual project citation of 94 is from the College of Human Development. A high citation count reflects depth and diversity in the literature review, as well as a measure of honesty in research reporting. The lowest individual project citation of 6 is from CST. It is also a corroboration of the findings in table 4 that Science & Technology research projects tend to produce fewer citations compared to other colleges.

Conclusion and Recommendations

This analysis provides the Covenant University library with an opportunity to evaluate its collection, because it reflects the research interests of the students in the university. The authors of these research reports cited heavily from textbook holdings of the university library, even though one would expect more journal citations. Internet and electronic resources were less frequently cited, which could be due to a lack of information literacy skills. Those skills could be improved through user education programs.

The average of 26.3% citations per report is encouraging, especially since the citations made were derived from sources in the university library only without using sources from other library collections. The knowledge of what students writing their final year research project report require should help the library serve them better.

Project supervisors should instruct students to read material on their topics as a preliminary activity, before the actual literature review. This would sharpen focus and give direction to the authors, and would enrich the work, which would be reflected in the number of citations. Students must choose their research topics early, because haste leads to inadequate reading, resulting in poor citation and a lack of depth.

Project supervisors should randomly check citations to deter students from using spurious and nonexistent authors, and protect institutions from embarrassment and damaged credibility. Further studies could be conducted in the next five years to see whether degree students research report citations are consistent with the findings of this study. Further studies should in addition examine the subject areas and gender dimensions of the citations.

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