



*Evidence Summary*

**Citation Analysis of Engineering Graduate Student Theses Indicates Students Are Using More Electronic Resources**

**A Review of:**

Becker, D. A., & Chiware, E. R. T. (2015). Citation analysis of masters' theses and doctoral dissertations: Balancing library collections with students' research information needs. *Journal of Academic Librarianship*, 41(5), 613-620. <http://dx.doi.org/10.1016/j.acalib.2015.06.022>

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**Abstract**

**Objective** – To determine the citation pattern of graduate students' theses and dissertations.

**Design** – Citation analysis.

**Setting** – An institutional repository at a South African university of technology.

**Subjects** – 201 Engineering Master's theses and Doctoral dissertations.

**Methods** – A random sample of Master's theses and Doctoral dissertations from the Faculty of Engineering were analyzed. The theses and dissertations were drawn from the institutional repository covering the period

2005-2014. References were checked for format of the cited items including journal, book, conference proceeding, online item (resource with a URL other than a journal, book or proceeding), and other (anything not in the first four categories). The date of all journal articles was recorded. Journal titles were analyzed in terms of country of origin, language, availability in the library, and online access. Data were categorized by department to determine if there were any differences in the use of materials by department. Data were also analyzed by degree level.

**Main Results** – 101 theses and dissertations were analyzed out of a total of 201 available in the institutional repository. Journals were the most used resource (42%), followed by books

(30%), other (12%), online (10%), and proceedings (6%). Doctoral students used a higher percentage of journals than Master's students. Departmental usage differed. Mechanical (54%) and Chemical (48%) Engineering students mainly used journals. Civil Engineering students mostly used resources from the "other" category (31%). Students in Industrial (41%) and Construction (40%) Engineering mostly cited books. Analysis of the "other" category showed a wide variety of resources used (emails, personal interviews, course notes, conference papers, government publications, national and international standards, manuals and guides, technical reports, and technical notes).

The technology university provides access to 79% of the journal titles used by engineering students in their theses and dissertations. 84% of titles are available online. Students mainly used current articles (i.e., from 2000-present). Students heavily favoured journals from the United States of America and Europe, although South African journals were the fifth most cited by country. English language titles dominated, however Portuguese and French titles were the next most commonly cited. Seventy-four titles were referenced more than 10 times.

**Conclusion** – The authors state that more electronic resources are being used by graduate students, including "online" information. Journals are the most cited information resource held by the library and the majority of journal titles that were cited can be found in the library. The authors conclude that librarians should work with graduate students to encourage the continued use of library resources. They also state that this information can be useful for identifying journals that could be canceled in times of budgetary cutbacks. The authors note that this study provides the university libraries with insight into the use of library holdings, but being limited to engineering, a more comprehensive study of subjects would provide a broader picture of the collection's use and provide valuable information for collection development.

## Commentary

This article follows in the footsteps of several others investigating the referencing behaviour of engineering researchers including graduate students. Perryman's Critical Appraisal Tool for Bibliometric Studies (2009) was used as a guide for this appraisal. The literature review covers the current relevant literature. The literature does not suggest a gap in the research record, however according to the authors, in the South African context engineering is an important growth area. Consequently the university has an interest in understanding how the library supports graduate students in this field.

The data collection method was clearly explained and included inclusion criteria. The authors noted the main limitation of the collection method: not all theses and dissertations from the Faculty of Engineering for the specified time period (285) were in the institutional repository, as they had not all been digitized and hence were not accessible to be used in the sample. The authors do include a table of all of the theses and dissertations broken down by department and degree level for the time period as well as a table of the sample population analyzed. A comparison of these tables shows that the sample contains a higher percentage of older theses and dissertations (2005-2009), with the exception of the year 2014. Also, the sample contains a higher percentage of the total number of Master's theses compared to the total number of Doctoral dissertations. This has implications for the representativeness of the sample despite the large sample size. The authors did not discuss the rationale, nor did they include a statistical calculation of their sample size.

The authors did include appropriate and sufficient examples of the data analysis to answer all of the stated objectives. The analysis is well organized and clearly described. There was one discrepancy in the stated sample size. The text stated that 101 theses and dissertations were analyzed, however Table 2 showed a total of only 98. This discrepancy is not addressed in the article. In the subsequent

Table 4, the total number is again referred to as 101.

This study achieves its stated objectives and builds on the prior research in this area. The real value of this analysis is for the library itself. This research helps provide a much clearer picture of the use of the collection, the collection's strengths and weaknesses, and can help inform decision making about the collection. This paper demonstrates the utility of citation analysis as a method for collection

assessment and development and provides a clear example of how to conduct citation analysis. The findings will help others doing similar investigations of their own collections.

### **Reference**

Perryman, C. (2009). Critical appraisal tool for bibliometric studies. Retrieved from <https://www.dropbox.com/l/scl/AAAL7LUZpLE90FxFnBv5HcnOZ0CtLh6RQrs>