Citation analysis assumes that research published in prestigious journals with high impact scores and research published by scientists who enjoy high impact ratings will be cited more frequently than other research (Vucovich, Baker & Smith (2008:63). A further assumption is that the more a researcher or a paper is cited, the higher the impact of the research will be on the subject discipline (Meho, 2007:1).

The importance of both citations and citation analysis in scholarly information should be understood to fully appreciate the value of citation resources as a scholarly tool.

Definitions of terms

A citation can be described as a written reference to a specific work or portion of a work. The work referred to could be a book, an article, a dissertation, a report, or a musical composition that has been produced or created by a particular author, editor, or composer.

A citation clearly identifies the work in which the passage is to be found. A citation is therefore a short bibliographic note which gives recognition to a source of information or of a quoted passage. Adapted from the Free Dictionary by Farlex (2010:1).


Citation analysis is facilitated by citation resources and refers to the examination of the frequency and pattern of citations (or references) in scholarly or peer-reviewed journal articles and books. Citation analysis uses citations in scholarly works to establish links to other works, or other researchers. Research patterns and trends can thus be identified, as well as the currency of research. The frequency with which a work is cited is usually considered a measure of its importance in the literature of the field (Reitz, 2004:142).
In the study by Vucovich, Baker & Smith (2008:63), participating authors Egghe and Rossouw suggest that citation counts can be based on the following assumptions:

- if an article is cited by an author, it implies the document was used
- the merit (impact or significance) of the article is reflected by the citation
- it is implied that the references are derived from the best literature on the topic
- the content of the articles being cited is indeed related to the topic of the article

**Citation resources** can be described as any print, electronic or web-based resources which include citations (or references) and citation analysis tools for the purpose of determining citation trends. Examples of citation resources are databases such as *Web of Science, Scopus, and Chemical Abstracts*. *Google Scholar* is also considered an effective tool to use when sourcing citation references.
Types of Citation Resources

The following two databases are subscription based citation resources:

**Web of Science (WOS)** is an ISI Thomson product aimed at producing an abstract and citation resource with a large variety of peer-reviewed literature such as scholarly journal articles, reports and conference proceedings. It includes analytic tools to track and analyse research and caters for the Sciences, the Social Sciences, and the Arts and Humanities.

**Scopus** is an Elsevier product aimed at producing an abstract and citation resource with a large variety of peer-reviewed literature and high quality websites from 1996 to the present. It includes analysis tools to track, analyse and visualise research and caters for the Science, Technical, Medical, Social Sciences (including Arts and Humanities) market. It is suggested that Scopus embraces the open web-based tools similar to Google Scholar, while providing selected peer-reviewed resources similar to WOS. The target audience of Scopus is undergraduates, scholarly researchers and subject specialists (Golderman & Connolly (2007:19).

**Google Scholar**, on the other hand, is an example of a free citation resource, and is available on the Internet. It covers research documents such as journal articles, conference papers, theses, books, pre-prints, abstracts, technical reports and other scholarly information. The appeal of Google Scholar is that it is a free web-based citation resource which allows easy access to scholarly information in all disciplines (Jacso 2005b:208).

Google Scholar is an important service for researchers who have no access to the traditional or fee-based resources. Citations are harvested from the reference lists of documents found on the open web, as well as accessible material produced by journal publishers, scholarly societies, database vendors and academic institutions.

For more information on Google Scholar go to [http://scholar.google.co.za/intl/en/scholar/about.html](http://scholar.google.co.za/intl/en/scholar/about.html).
Citation resources on the Unisa Library homepage

- Go to the library webpage at [http://www.unisa.ac.za/library](http://www.unisa.ac.za/library)
- click on the e-Resources link under the heading *Online collections*
- click on the *A-Z list of electronic resources* and choose the appropriate letter of the alphabet

**Web of Science (WOS)**

The *ISI Web of Knowledge* trademark refers to the collection of resources available in the ISI suite of tools:

- *Web of Science* (Science Citation Index, Social Science Citation Index and Arts & Humanities Citation Index)
- *Conference Proceedings Citation Index* (Science and Social Science & Humanities)
- *Journal Citation Reports* - JCR
- *Analytical tools*

Cited Reference search options:

This option allows you to search for articles that cite a particular author’s work. *WOS* allows the following search options: author, publication year and source title.
Search results for *Web of Science*

The search results are listed in a short view format with the following fields: title (hypertext link), author, source, volume, issue, page, publisher and citations. There is a summary box with the search strategy which lists the number of search results. The option to refine search results includes the ability to refine within the search results, the subject areas, document types, authors, source titles, and publications. The opportunity to analyze the search results is given via a link to the analyzing tool.

The individual record includes the specific information of the entry on the journal article. The opportunity to source a citation report, which lists the amount of citations and the average citations per year, can be sourced.

Hypertext linking is a feature which allows for access between web pages within the resource and from the resource to another resource via hypertext linking and software protocol.

- *WOS* allows for inter-database linking to the cited and citing sources, eg. linking to the original article in the publisher's archive or webpage

- *WOS* allows for intra-database linking to the cited and citing sources, eg. linking to other scholarly articles related to the author, the source or part of the reference list and part of the citation resource
Scopus

Search options available to the user are arranged in tabs which include: basic search, author search, affiliation search and advanced search. The analytics option represents the citation analysis tools on Scopus. The next three options represent the personalized manipulation features Scopus supplies to users who register and login as individual. The options of limiting to date range, document type and subject area are available. The sessions search history is displayed on lower section of the page.

- Basic search: enter your search term after deciding on the topic of research, eg. Zachman Framework
- Author Search: enter the author’s name to retrieve items published by the author, eg. Zachman
- Affiliation Search: enter the author’s affiliation, eg. Unisa or University of Pretoria, to retrieve all institution affiliated items

Cited Reference search options:

Scopus allows the following search options: author, publication year, article title, source title and page number.

Hypertext linking is a feature which allows for access between web pages within the resource and from the resource to another resource via hypertext linking and software protocol.

- Scopus allows for inter-database linking to the cited and citing sources, eg. linking to the original article in the publisher archive or publisher webpage
- Scopus also enables intra-database linking to the cited and citing sources by linking to other scholarly articles related to the author, or the source, or part of the reference list or citation resource (Elsevier B.V., 2010:1)
**Google Scholar**

Google Scholar is not as sophisticated as the other citation databases when doing a citation analysis – look out for duplicates and different versions of the same article being cited.

Hypertext linking is a feature which allows for access between web pages within the resource and from the resource to another resource via hypertext linking and software protocol.

- Google Scholar allows for inter-database linking to the cited and citing sources, eg. linking to the original article in the publisher archive or publisher webpage
- GS enables partial intra-database linking to the cited and citing sources, but only to HTML and newer versions of PDF documents - older PDF documents are not accessible (Google, 2010:1)

Google Scholar does not have citation analysis capabilities at present.
Citation analysis tools

The citation tools available via the fee-based citation resources offer a quick method of analysing citation references in order to establish citation trends, citation networks and impact of scholarly journals to the body of research of the discipline.

**Web of Science**

*WOS* is equipped with *Journal Citation Reports (JCR)* 2003-2008, a citation analysis tool with analytical capabilities. It helps the researcher to determine the scholarly journal with the highest impact factor in a discipline, identify citation patterns, and discover emerging trends (Thomson Reuters, 2010:1).

The citation analysis tool in *Web of Science* can be located under the tab for *Citation Reports*. Click on *Analyse results* to create a citation report of the journal. Ideally the analysis will allow the researcher to establish the citation counts of the journal article, as well as who has been cited, and which institution affiliations exist in the research discipline. An example below illustrates the number of published items per year, versus the citations per year for a specific journal.

![Graphs showing published items and citations per year](image-url)
Scopus

Scopus allows for citation analyses with analytical capabilities. The citation analysis tool, Journal Analyzer, helps give insight into journal performance (Elsevier B.V., 2010:1). It can be located under the option for Analytics, and allows specified journals to be compared regarding total citations, the articles published and identified trends. The data can be displayed in chart or table formats, see example below:

![Chart format](chart.png) ![Table format](table.png)

The Journal Analyzer further allows for calculations of the total citations per journal, articles published, and will compare the journal in question to other journals using a trend line.

References
