

# Research Tools: Literature Search and Scientific Source Comparison

Nader Ale Ebrahim, PhD

Visiting Research Fellow

Research Support Unit Centre for Research Services Research Management & Innovation Complex University of Malaya, Kuala Lumpur, Malaysia



aleebrahim@um.edu.my



@aleebrahim



www.researcherid.com/rid/C-2414-2009 http://scholar.google.com/citations





Available online at: <a href="http://dx.doi.org/10.6084/m9.figshare.2070115">http://dx.doi.org/10.6084/m9.figshare.2070115</a>

## Research Tools: Literature Search and Scientific Source Comparison

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Research Support Unit
Centre for Research Services
Research Management & Innovation Complex
University of Malaya, Kuala Lumpur, Malaysia
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#### **Abstract**

**Abstract:** "Research Tools" can be defined as vehicles that broadly facilitate research and related activities. Scientific tools enable researchers to collect, organize, analyze, visualize and publicized research outputs. Dr. Nader has collected over 700 tools that enable students to follow the correct path in research and to ultimately produce high-quality research outputs with more accuracy and efficiency. It is assembled as an interactive Web-based mind map, titled "Research Tools", which is updated periodically. "Research Tools" consists of a hierarchical set of nodes. It has four main nodes: (1) Searching the literature, (2) Writing a paper, (3) Targeting suitable journals, and (4) Enhancing visibility and impact of the research. Several free tools can be found in the child nodes. In this workshop some tools as an example from the part 1 (Searching the literature) will be described. The e-skills learned from the workshop are useful across various research disciplines and research institutions.

**Keywords:** H-index, Improve citations, Research tools, Bibliometrics, Literature review

#### **Problem statements**

Research can be time consuming and sometimes tedious. The following statements capture some of the main concerns of the researchers as faced in the research process:

"I just join as a new postgraduate student and I am not sure how to do a literature search"

"I have been in research for some time now but I spend a lot of time to get the articles I want"

Can research become, easier, more fun and more resultoriented? The answer to this question is YES. We need an effective search strategy which can save hours of wasted research time and provide a clear direction for your research.

### learning outcomes

- Ability to develop effective search strategy which can save hours of wasted research time and provide a clear direction for your research
- Ability to define and develop a research topic
- Ability to evaluate different keywords for their research topic
- Ability to identify/evaluate different information formats and be able to choose the most appropriate for the research topic
- Ability to develop and refine search techniques for electronic and Internet resources
- Ability to assess information for the purpose of a literature review
- Ability to differences between academic journals in terms of quality
- Ability to use the different sorts of alert services



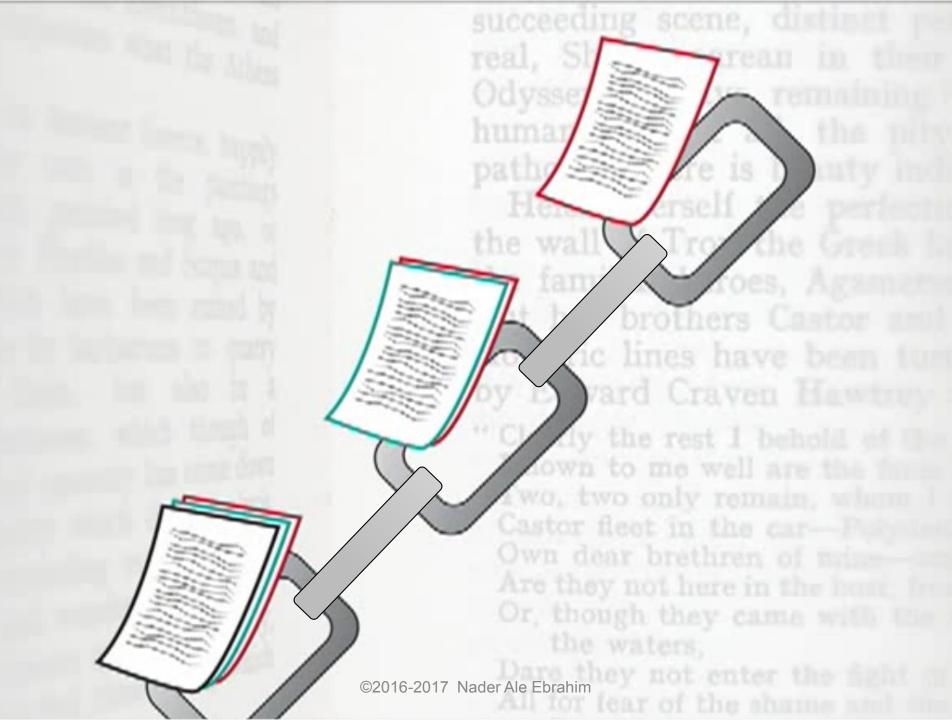
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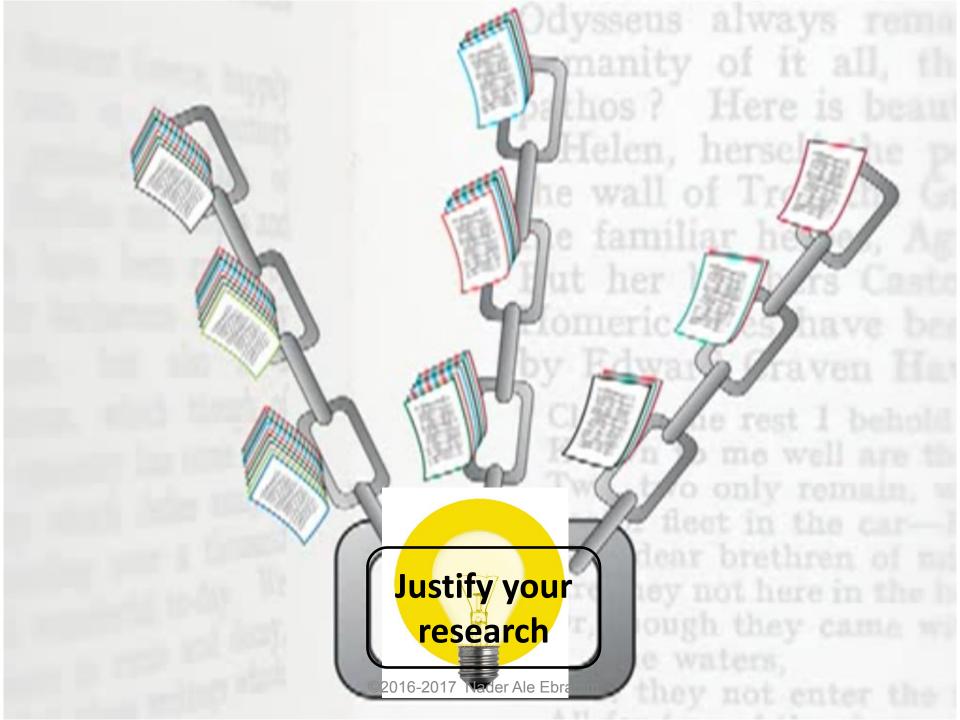
#### What is a literature review

A literature review discusses published information in a particular subject area, and sometimes information in a particular subject area within a certain time period.

A literature review can be just a simple summary of the sources, but it usually has an organizational pattern and combines both summary and synthesis. A summary is a recap of the important information of the source, but a synthesis is a re-organization, or a reshuffling, of that information. It might give a **new interpretation of old material** or **combine new with old interpretations**. Or it might **trace the intellectual progression of the field**, including major debates. And depending on the situation, the literature review may **evaluate the sources and advise the reader** on the most pertinent or relevant

Source: <a href="http://writingcenter.unc.edu/handouts/literature-reviews/">http://writingcenter.unc.edu/handouts/literature-reviews/</a>





### Identifying a Research Problem

Researchers begin a study by identifying a research problem that they need to address. They write about this "problem" in the opening passages of their study and, in effect, give you as a reader the rationale for why the study is important and why you need to read their study.

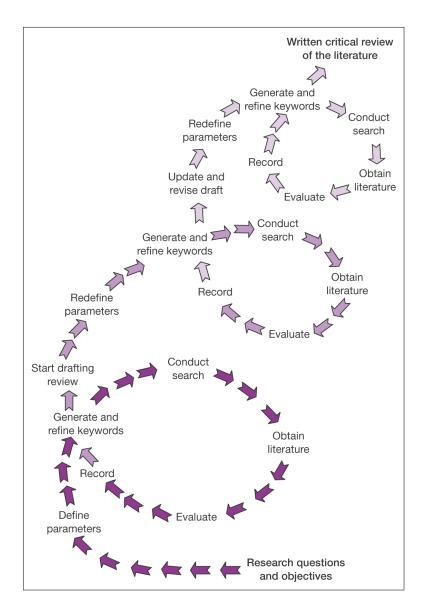
Reference: Creswell, J. W. (2012). Educational research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research (4th ed. ed.). Boston: Pearson Education, Inc.

### Reviewing the Literature

- With so much information available, searching and locating good literature on your topic can be challenging. Five steps will provide a sense of how researchers proceed in reviewing the literature are:
- 1. Identify key terms to use in your search for literature.
- 2. Locate literature about a topic by consulting several types of materials and databases, including those available at an academic library and on the Internet.
- 3. Critically evaluate and select the literature for your review.
- 4. Organize the literature you have selected by abstracting or taking notes on the literature and developing a visual diagram of it.
- 5. Write a literature review that reports summaries of the literature for inclusion in your research report.

Reference: Creswell, J. W. (2012). Educational research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research (4th ed. ed.). Boston: Pearson Education, Inc.





#### The literature review process

### Effective searching

- » Developing a search strategy
  - » Searching the library catalogue
  - » Finding journal articles and papers
  - » Searching the Internet
  - » Other sources

Source: http://learnline.cdu.edu.au/myresearch/plan/searchstrategy.html

### Developing a search strategy

- <u>» Defining the topic</u>
  - » Considering the scope of your topic
  - » Identifying the main or important aspects



- » Compiling a list of keywords
- » Developing your search strategy
- It is important to develop a search strategy to, not only, find the information you need but to also clarify your topic.

## How to Find and Develop a Viable Research Topic?

**Step One: Identify a Topic.** 

Step Two: Test Your Topic.

Test the main concepts or keywords in your topic by looking them up in the appropriate background sources or by using them as search terms.

If you are finding too much information and too many sources, narrow your topic by using the **and** operator

Finding too little information may indicate that you need to broaden your topic.

#### Improving Readership of Your Articles

Appearing at the top of the list of search results, and having a useful description of your work, greatly improve the likelihood that a reader will find and download your document.

- Abstracts should include keywords that potential readers are likely to use in searches. It is especially valuable to modify and reuse words that appear in the document's title and full text to improve the article's rank when readers search for those words.
- The first sentence of the abstract is all that is likely to be displayed in the search page results, so make your first sentence one that will encourage readers to click the link.

### Research Tools Mind Map



### Keywords

### Selecting keywords lead to get more

citation.



MASTER KEYWORDS

LIST

Journal of International Business

Studies

Design Studies

Choose up to five keywords for your paper from this list. You may substitute one keyword of your own choice not on this list.

aesthetics architectural design artificial evolution automotive design built environment case based reasoning case study/studies collaborative design

KEYWORDS LIST

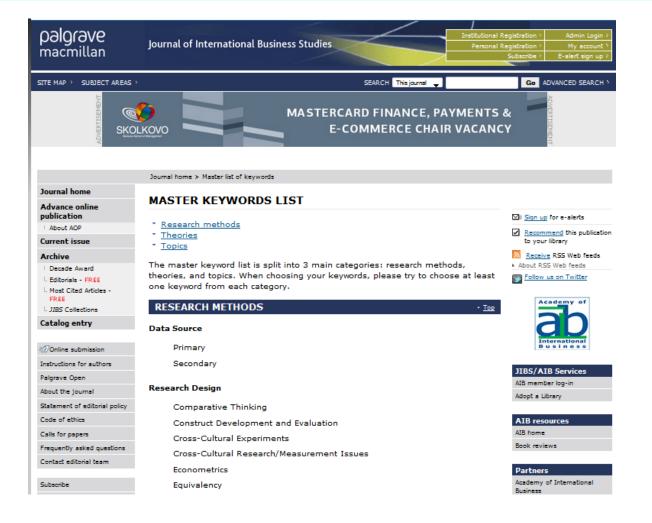
environmental impact epistemology evaluation expert systems facility programming generic design graphic design



MeSH (Medical Subject Headings)



### **Master Keywords List**



#### MeSH Tree Structures for "Genes"

#### MeSH Tree Structures

Genetic Phenomena [G05]

Genetic Structures [G05.360]

Genome [G05.360.340]

Genome Components [G05.360.340.024]

Attachment Sites, Microbiological [G05.360.340.024.079]

CpG Islands [G05.360.340.024.159]

DNA Sequence, Unstable [G05.360.340.024.189] +

DNA, Intergenic [G05.360.340.024.220] +

Genes [G05.360.340.024.340]

Alleles [G05.360.340.024.340.030]

Gene Components [G05.360.340.024.340.137] +

Genes, cdc [G05.360.340.024.340.220]

Genes, Chloroplast [G05.360.340.024.340.225]

Genes, Developmental [G05.360.340.024.340.230] +

Genes, Dominant [G05.360.340.024.340.240]

Genes, Duplicate [G05.360.340.024.340.250]

Genes, Essential [G05.360.340.024.340.270]

Genes, Helminth [G05.360.340.024.340.310]

Genes, Immediate-Early [G05.360.340.024.340.330]

Genes, Immunoglobulin [G05.360.340.024.340.335] +

Genes, Insect [G05.360.340.024.340.340]

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### Foundations of searching

- Virtual AND (Team\* OR group OR "Virtual R&D Teams") NOT (Management OR Manager)
- The toolset?
  - 1. "phrase searching"
  - 2. truncat\*
  - 3. OR
  - 4. AND, NOT
  - 5. (brackets OR parentheses)

### **Truncation**

Symbol	Retrieves
*	Zero or more characters *carbon* carbon, hydrocarbon, polycarbonate
\$	Zero or one character colo\$r color, colour
?	One character only en?oblast entoblast, endoblast

### Keywords Plus

 KeyWords Plus® are index terms created by Thomson Reuters from significant, frequently occurring words in the titles of an article's cited references.

Source: http://images.webofknowledge.com/WOK46/help/WOS/h\_fullrec.html

#### **Keywords and Keywords Plus®**

Authors sometimes provide a list of keywords or terms that they feel best represent the content of their paper. These keywords are contained in the ISI record (1991 data forward, depending on the database) for each article and are searchable. In addition, ISI generates KeyWords Plus for many articles. **KeyWords Plus** are words or phrases that frequently appear in the titles of an article's references, but do not necessarily appear in the title of the article itself. KeyWords Plus may be present for articles that have no author keywords, or may include important terms not listed among the title, abstract, or author keywords.

Source: http://wos.isitrial.com/help/helpdefs.html

### KeyWords Plus® Creation Cycle

#### SAMPLE SOURCE RECORD

Kanceliak B: Macan J: Ilic Z: Ebling Z Journal: AMERICAN JOURNAL OF INDUSTRIAL MEDICINE, 1999, V35, N1 (JAN), P 68-75 Author Keywords: brewery workers; respiratory symptoms; lung function; immunology Selected Cited References: (39 total, 14 shown for demonstration) \*WHO, 1986, P39, EARL DET OCC LUNG DI BLASKI CA, 1996, V154, P334, AM J RESP CRIT CARE HUY T. 1991, V144, P1314, AM REV RESPIR DIS. IVERSEN M. 1990, V20, P211, CLIN EXP ALLERGY KORTEKANGASSAVO.O, 1993, V48, P147, ALLERGY KORTEKANGASSAVO.O. 1994. V24. P836. CLIN EXP ALLERGY MAESTRELLI P. 1992, V22, P103, CLIN EXP ALLERGY MALMBERG P. 1986, V10, P316, AM J IND MED MCCARTHY PE. 1985, V42, P106, BRIT J IND MED MEZNAR B, 1989, P148, 14 INT C EUR AC ALL REVSBECH P. 1990, V45, P204, ALLERGY SHELDON JM, 1957, P507, MANUAL CLIN ALLERGT SMID T. 1994, V25, P877, AM J IND MED

VIDAL C, 1995, V75, P121, ANN ALLERG ASTITIMATIN

Title: Respiratory and immunological findings in brewery workers

Author(s): GodnicCvar J; Zuskin E; Mustaibegovic J; Schachter EN (REPRINT);

KeyWord Plus(R): ATOPIC-DERMATITIS PATIENTS; LUNG-FUNCTION; GRAIN DUST; OCCUPATIONAL ASTHMA; MITE ALLERGY; STORAGE MITE; EXPOSURE, HYPERSENSITIVITY; SYMPTOMS; DISEASE

#### ISI SOURCE DATABASE (1970-PRESENT)

No title available

The role of atopy in grain dust-induced airway disease

GRAIN DUST AND LUNG-FUNCTION - DOSE-RESPONSE RELATIONSHIPS

MITE ALLERGY AND EXPOSURE TO STORAGE MITES AND HOUSE DUST MITES IN FARMERS

SKIN PRICK TEST REACTIONS TO BREWERS-YEAST (SACCHAROMYCES-CEREVISIAE) IN ADULT ATOPIC-DERMATITIS PATIENTS

IMMEDIATE HYPERSENSITIVITY TO BAKERY, BREWERY AND WINE PRODUCTS IN YEAST-SENSITIVE ATOPIC-DERMATITIS PATIENTS

GUIDELINES FOR THE DIAGNOSIS OF OCCUPATIONAL ASTHMA

RELATIONSHIP BETWEEN SYMPTOMS AND EXPOSURE TO MOLD DUST IN SWEDISH FARMERS

LUNG-FUNCTION AFTER EXPOSURE TO BARLEY DUST

No title available

STORAGE MITE ALLERGY AMONG BAKERS

No title available

DUST-RELATED AND ENDOTOXIN-RELATED ACUTE LUNG-FUNCTION CHANGES AND WORK-RELATED SYMPTOMS IN WORKERS IN THE ANIMAL FEED-INDUSTRY

FOOD-INDUCED AND OCCUPATIONAL ASTHMA DUE TO BARLEY FLOUR

#### FREQUENTLY OCCURRNING TITLE WORDS

ATOPIC-DERMATITIS PATIENTS LUNG-FUNCTION GRAIN DUST OCCUPATIONAL ASTHMA MITE ALLERGY STORAGE MITE EXPOSURE HYPERSENSITIVITY SYMPTOMS DISEASE

Source: http://www.lib.vt.edu/help/handouts/databases/wos-workbook-8.pc

#### KeyWords Plus- Example

- New Product Development in Virtual Environment (ISI Indexed)
- Author Keywords: New product Development;
   Virtual teams; Concurrent Collaboration; Review paper
- KeyWords Plus: DEVELOPMENT TEAMS;
   PERFORMANCE; TECHNOLOGY;
   KNOWLEDGE; COMMUNICATION;
   PERSPECTIVE; INTEGRATION; INNOVATION;
   NETWORK; WORKING

#### **Key Words Selection**

Results: 26

(from Web of Science Core Collection)

You searched for:

**TITLE:** ("Envelope Design")

Timespan: All years. Indexes: SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH.

Results: 477

(from Web of Science Core Collection)

You searched for:

**TITLE:** (("efficiency envelope\*") OR (envelope NEAR/5 building) OR (envelope NEAR/5 energy) OR ("envelope\* energy\* saving\*") OR ("Envelope\* System\*") OR ("thermal\* envelope\*") OR ("Envelope\* Design\*"))

Timespan: All years. Indexes: SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH.

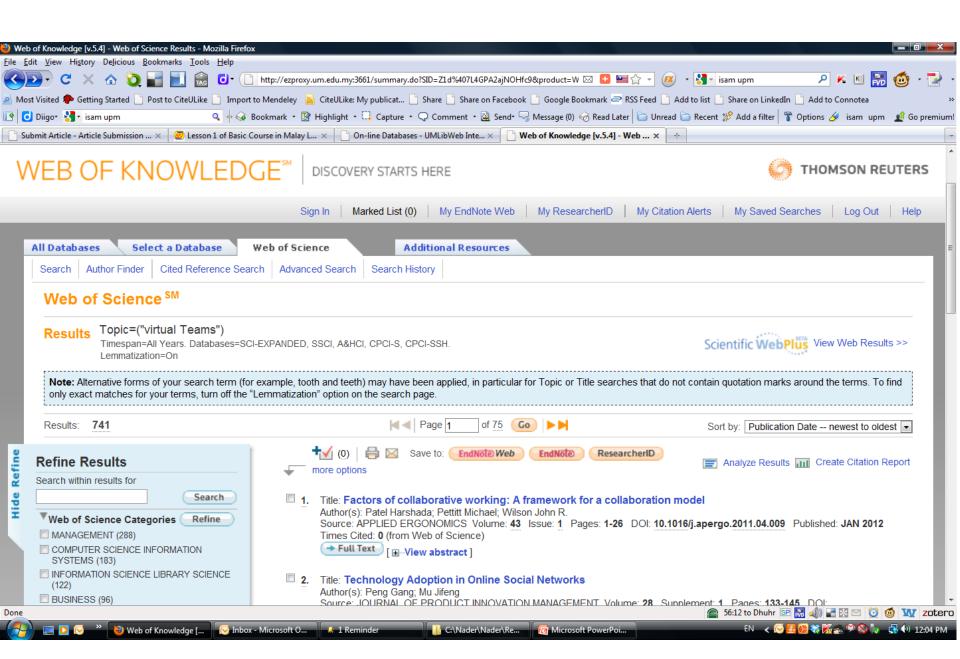
### **Key Words Selection**

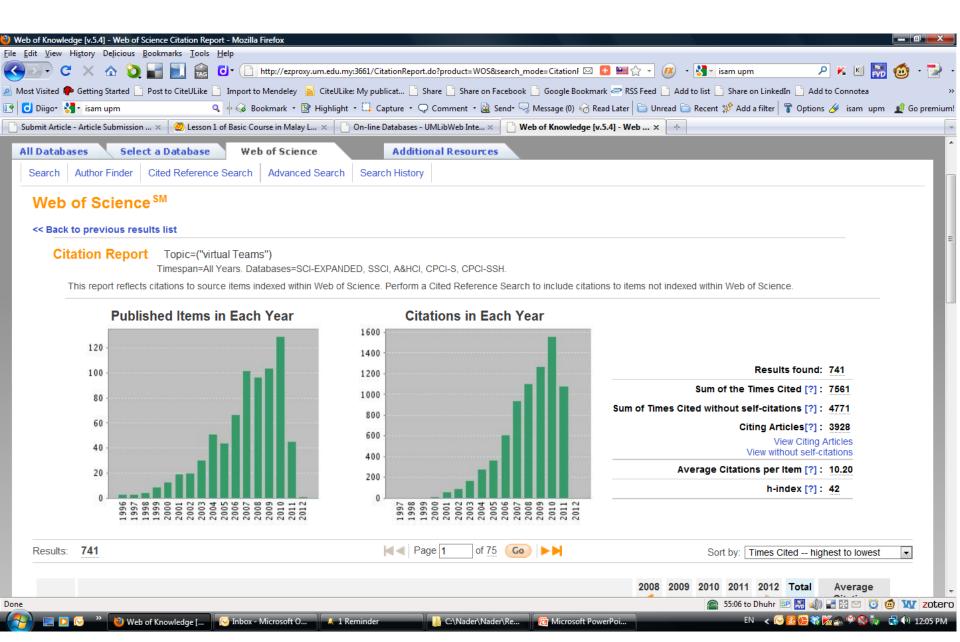
TABLE 1: Search phrases used

Field	Search Strings
general/other	brain surgery – neurosurgery – hydrocephalus – peripheral nerve surgery
vascular	aneurysm surgery – arteriovenous malformation* – carotid endarterectomy – cavernous malformation – extracranial intracranial bypass – intracranial aneurysm* – [intracranial or intracerebral] and [hematoma or hemorrhage] – subarachnoid hemorrhage – vasospasm
tumor	brain tumor surgery – meningioma – glioblastoma* – glioma – meningioma – radiosurgery – radiotherapy
trauma	brain injury – coma – head injury – brain damage – spinal injury
functional	deep brain stimulation – epilepsy surgery – Parkinson's surgery – spinal cord stimulation – trigeminal neuralgia – stereotactic – stereotaxic – stereotaxy
spine	spine fusion – spine fixation – spine surgery – spinal surgery – spinal fusion – spinal fixation – [cervical or thoracic or lumbar] and [disc* or disk*]

<sup>\*</sup> The asterisk was included in the search string as a wild card character. For example, the search "disc\*" would return results for "discs" or "discectomy."

Source: Ponce, F. A., & Lozano, A. M. (2014). Highly cited works in neurosurgery. Part II: the citation classics A review (vol 112, pg 233, 2010). Journal Of Neurosurgery 120(5), 1252-1257. doi: 10.3171/2014.2.JNS14358a







#### Critically Analyzing Information Sources

#### 1- Initial Appraisal:

**Author** 

**Date of Publication** 

**Edition or Revision** 

Publisher

Title of Journal (Distinguishing Scholarly Journals from other Periodicals)

#### 2- Content Analysis:

**Intended Audience** 

Objective Reasoning

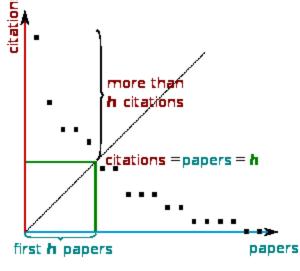
Coverage

Writing Style

**Evaluative Reviews** 

#### h-index (Jorge E. Hirsch)

A scientist has index h if h of [his/her]
 N<sub>p</sub> papers have at least h citations each, and the other (N<sub>p</sub> - h) papers have at most h citations each.



H-index from a plot of decreasing citations for numbered papers

#### Publish or Perish

Publish or Perish is a free program that retrieves citations from Google Scholar and allows users to calculate:

- Total number of papers
- Total number of citations
- Average number of citations per paper
- Average number of citations per author
- Average number of papers per author
- Average number of citations per year
- Hirsch's h-index and related parameters
- The contemporary h-index
- The age-weighted citation rate
- Two variations of individual h-indices
- An analysis of the number of authors per paper

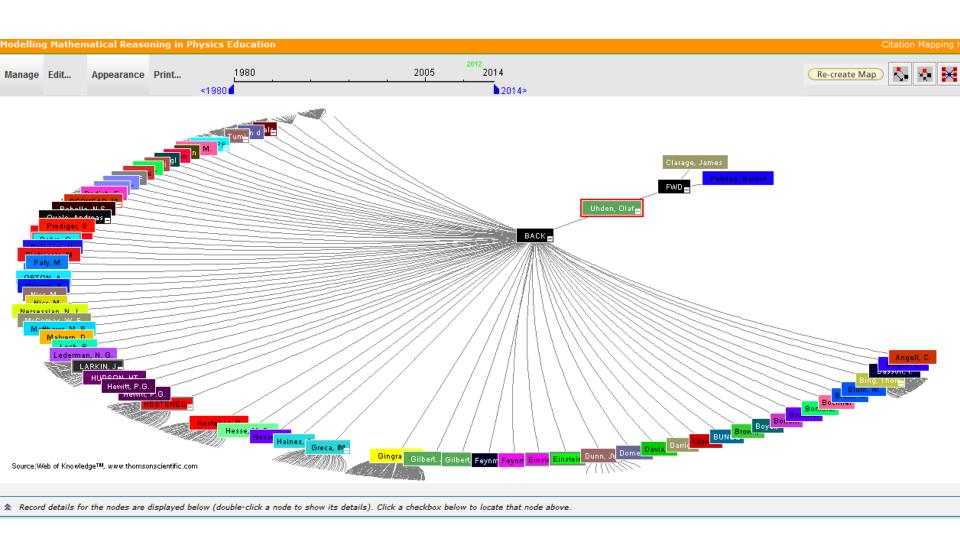
Source: <a href="http://guides.library.vu.edu.au/content.php?pid=251876&sid=2079929">http://guides.library.vu.edu.au/content.php?pid=251876&sid=2079929</a>

#### Web of Science

 Web of Science® is perhaps the most wellknown tool for determining the number of times a publication has been cited.

- Web of Science® is made up of three citation indexes owned by Thomson Scientific:
  - Science Citation Index ®
  - Social Sciences Citation Index ®
  - Arts & Humanities Citation Index ®.

Source: <a href="http://guides.library.vu.edu.au/content.php?pid=251876&sid=2079929">http://guides.library.vu.edu.au/content.php?pid=251876&sid=2079929</a>





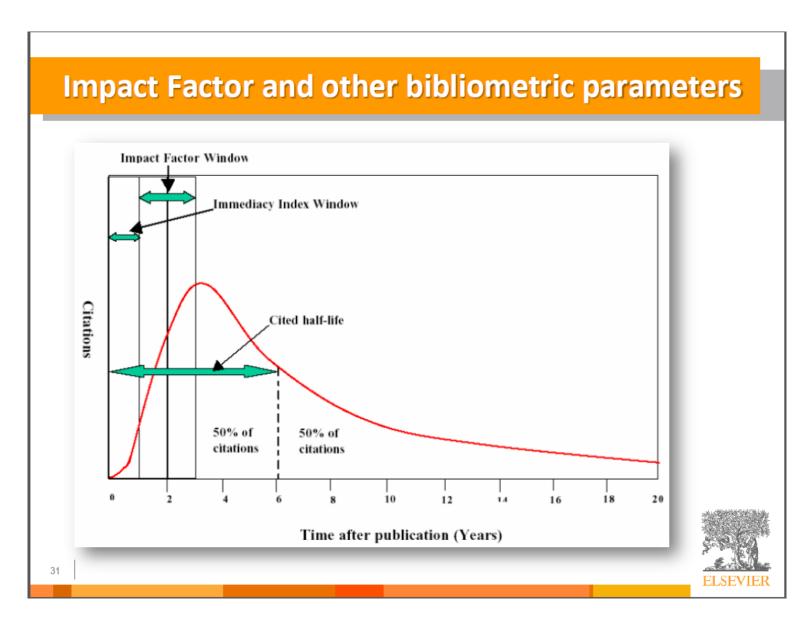


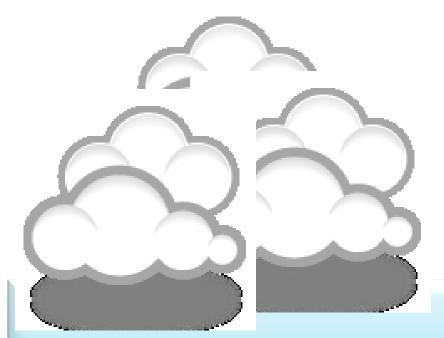
### Paper/journal quality

- Another guide to paper/journal quality is the general reputation of the association, society, or organization publishing the journal.
- Leading professional associations such as American Psychological Association (APA) or the Institute of Electrical and Electronics Engineers (IEEE) publish a range of journals that are highly regarded.

#### **Impact Factor**

 The most commonly used measure of journal quality is Impact Factor. This is a number which attempts to measure the impact of a journal in terms of its influence on the academic community. Impact Factors are published by Thomson-ISI





Keeping up-to-date (Alert system)

#### Keeping up-to-date

Alert services are an effective means of keeping track of the latest research.

#### What is an alert service?

- Many journal databases and book publishers offer free alert services. These are an effective means of keeping track of the latest research.
- Alert services come in different forms. The most common include:
  - a search alert. This is a saved search which alerts you when a book or article that matches your search terms is published.
  - a TOC (Table of Contents) alert. Such an alert notifies you when a new issue of a journal is published, and provides you with the issue's table of contents.
  - a citation alert. This advises you when a new article cites a particular work.
  - Most alert services are email-based. An increasing number are now offered as an RSS feed. If you are just beginning, you might like to try email alerts first. These are generally easier to create.

### Keeping up-to-date

















ISI Web of Knowledge™

The MIT Press



**Scopus Citation Tracker** 



#### RESEARCH SUPPORT UNIT (RSU)

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RESEARCH MANAGEMENT & INNOVATION COMPLEX (IPPP)
UNIVERSITY OF MALAYA

#### Questions?

E-mail: aleebrahim@um.edu.my



Twitter: @aleebrahim



www.researcherid.com/rid/C-2414-2009 http://scholar.google.com/citations

#### Nader Ale Ebrahim, PhD

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Centre for Research Services
Research Management & Innovation Complex
University of Malaya, Kuala Lumpur, Malaysia
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