Course 3

How to read and understand scientific writings

Information Sources

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1 Introduction :

- During the university stream, students need to read and understand scientific products. However, when English will be a strange language for them, it will be difficult to deal with it.
- This course will help you and give you tips to read correctly and understand scientific articles.
- Before we start reading, we have to know what kind of scientific writing we are reading.

2 Information sources:

2.1 Web

The World Wide Web can be an excellent place to satisfy some initial research needs.

- It is a good resource for background information and for finding keywords for searching in the library catalog and databases.
- It is a good tool for locating professional organizations and searching for information and the names of experts in a given discipline.
- Google Scholar is a useful discovery tool for citations, especially if you are trying to get the lay of the land surrounding your topic or if you are having a problem with keywords in the databases. You can find some information to refine your search terms. It is NOT acceptable to depend on Google Scholar for finding articles because of the spotty coverage and lack of adequate search features.

To search correctly the scientific information in web, it is preferred to use the common scientific databases. Next are the most important databases for the biologists.

2.1.1 Google scolar:

The address: <u>https://scholar.google.com/</u>

Google Scholar is a search engine that specializes in searching scholarly literature and academic resources. While Google will return information contained in any website, Google Scholar limits its searching to just academic literature resources, including .edu sites. It is freely accessible, like Google, and can be very helpful to researchers.

Google Scholar does not have the same features as most databases do, leading it to be not as helpful in limiting or narrowing your search. Google Scholar is great for many things, including:

- Finding grey literature materials and research produced by those outside the traditional commercial or academic publishing sphere. Examples include white papers, government documents, reports, and evaluations
- Finding partial or obscure citations
- Finding information on particular journals or publications for a researcher new to their field

You can search for articles in google scholar using Keywords

Options :

here are many icons and links underneath each result when you search in Google Scholar. Here is an explanation of the common ones you will see.

This button will save the resource to your "My Library." You must have a Gmail account for this to work for you. You do not have to create a profile in Google scholar.

99

This button will open a box that has the citation information for the resource in many different styles. You can also download the citation to EndNote or another citation management software.

Cited by 82

This button will take you to a new Google Scholar search screen comprised of all the resources that have cited the search result. The number will vary depending on how many people have cited the resource.

Related articles

This button will take you to a new Google Scholar search screen comprised of articles the search engine has identified as similar or related to the resource you are looking at.

Web of Science: 18

This button is related to the Google Scholar and Web of Science integration. The number will vary depending on how many times the article is cited in Web of Science. Only current UTHSC affiliates will see this button. Clicking on this link will take you to the Web of Science Core Collection, and the results you see there will be articles that have cited the resource you are looking at.



Figure 1 Google Scholar engine

2.1.2 Web of science

Address : <u>https://clarivate.com/</u>

Guided by the legacy of Dr Eugene Garfield, inventor of the citation index for research literature, Web of ScienceTM is one of the world's most powerful research engine.

It is a multidisciplinary platform. it allows the researcher to track ideas across disciplines and time from almost 1.7 billion cited references from over 155 million records. Covering over 34,000 journals, the Web of Science platform allows you to be truly comprehensive in your search.

With the Web of Science platform, you can access an unrivalled breadth of world-class research literature linked to a rigorously selected core of journals and uniquely discover new information through meticulously captured metadata and citation connections.

Research data is booming. The opportunity to reveal meaningful linkages – between past and current research, between collaborators, between funding and research impact – is huge, and you can be confident in your understanding of a field and in your decisions when you start with the best data.

The web of science includes databases with a subject focus include Medline, BIOSIS Citation IndexTM, and Zoological RecordTM; databases with a document type focus include Derwent Innovations IndexTM (patents) and Data Citation IndexTM (datasets and data studies); and databases highlighting content from regions around the world include the Russian Science Citation IndexTM, KCI Korean Journal DatabaseTM, and SciELO Citation IndexTM (figure 1).

SCIE	SSCI	AHCI	ESCI	BKCI	CPCI
Learn more	Learn more	Learnimore	Learnmore	Learnmore	Learn more
Deta Citation Index	Derwent Innovation Index	BIOSIS Previews	Biological Abstracts	BIOSIS Citation Index	Current Contents Connect Learn more
Zoological Record	Inspec Learnmone	CABI: CAB Abstracts	CABI: Global Health Learn more	MEDLINE Learn more	FSTA – the food science resource Learn more
Russian Science Citation Index	Chinese Science Citation Index	KCI Korean Journal Database Learn more	SciELO Learn more		

Figure 2 Web of science databases

a- Zoological Record

Address: https://clarivate.com/webofsciencegroup/solutions/webofscience-zoological-record/

Zoological RecordTM is the world's oldest continuing database of animal biology. It is considered the world's leading taxonomic reference, and with coverage back to 1864, has long acted as the world's unofficial register of animal names. The broad scope of coverage ranges from biodiversity and the environment to taxonomy and veterinary sciences.

b- Biological Abstracts on Web of Science

Address: https://clarivate.com/webofsciencegroup/solutions/biological-abstracts-on-web-of-science/

Easily discover critical journal coverage of the life sciences with Biological AbstractsTM, with topics ranging from botany to microbiology to pharmacology. Including BIOSISTM indexing and MeSH terms, specialized indexing in Biological Abstracts helps you to discover more accurate, context-sensitive results.

Nearly every discovery is influenced by earlier research, both in its subject area and in related fields, and a publication can have significant influence and impact on other research after is has been published. When connected to the multidisciplinary citations on the Web of ScienceTM platform, Biological Abstracts has a full citation network to accurately and confidently connect you to the highest quality multidisciplinary research.

c- MEDLINE on Web of Science

MEDLINE is the U.S. National Library of Medicine (NLM) premier bibliographic database, covering biomedicine and life sciences topics vital to biomedical practitioners, educators, and researchers, such as bioengineering, public health, clinical care, and plant and animal science, nursing, dentistry, veterinary medicine, marine biology, and preclinical sciences. You'll find references from journals, newspapers, magazines, and newsletters.

Only through Web of ScienceTM are you able to access MEDLINE with the added value of citation data and the ability to simultaneously search content in Web of Science Core CollectionTM, FSTA, CAB Abstracts, and BIOSISTM products.

When connected to the multidisciplinary citations on the Web of Science platform, MEDLINE becomes so much more! Nearly every discovery is influenced by earlier research, both in its subject area and in related fields, and a publication can have significant influence and impact on other research after is has been published. No other platform has a full citation network to accurately and confidently connect you to the highest quality multidisciplinary research.

2.1.3 Scopus :

Address :

 $https://www.scopus.com/sources?zone=TopNavBar&origin=NO\%\,20ORIGIN\%\,20DEFINED$

Scopus is recommended for cited reference searching in the sciences and social sciences.

Scopus is an interdisciplinary, bibliographic database that indexes the contents of more than 15,000 journals in the physical sciences, engineering, earth and environmental sciences, life and health sciences, social sciences, psychology, business, and management.

Scopus also features cited references and can be searched for articles that cite a specific article.

The following steps outline how you can do a cited reference search in Scopus:

1. Enter a few citation details into the main search page. The most efficient way to search is to enter the article title in the first box. In the next search box, enter the author's last name.

2. In the search results, **the record for the proper citation will display how many times this article has been cited** according to Scopus. This number can differ from Web of Science and Google Scholar.

3. Click on the Find It button to access the full-text. If the Library does not have access to the article, you can request the article through Interlibrary Loan.

For more information about cited reference searching and general tips on using Scopus, consult the interactive tutorials from Scopus.

1st year Biology LMD

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4th quartile									

Figure 4 Display options in Scopus engine

2.1.4 PubMed

Address: <u>https://pubmed.ncbi.nlm.nih.gov/advanced/</u>

Comprises more than 33 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full text content from PubMed Central and publisher web sites.

You can search for any subject using many options us: author, book, date, editor, issue, journal, title ...

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Figure 5 PubMed search engine

2.1.5 Google books

Address : https://scholar.google.com/

Google Books is a service from Google Inc. that searches the full text of books and magazines that Google has scanned, converted to text using optical character recognition, and stored in its digital database.

You can search for books in google books using Keywords



2.2 Books and Reference Sources

Reference materials and books are available in both **print** and **electronic** formats. They provide gateway knowledge to a subject area and are useful at the **beginning** of the research process to:

- Get an overview of the topic, learn the scope, key definitions, significant figures who are involved, and important timelines
- Discover the foundations of a topic
- Learn essential definitions, vocabulary terms, and keywords you can use in your literature searching strategy

2.3 Scholarly Articles in Journals

Another major category of information sources is scholarly information produced by subject experts working in academic institutions, research centers and scholarly organizations. Scholars and researchers generate information that advances our knowledge and understanding of the world. The research they do creates new opportunities for inventions, practical applications, and new approaches to solving problems or understanding issues.

Academics, researchers and students at universities make their contributions to scholarly knowledge available in many forms:

- masters' theses
- doctoral dissertations
- conference papers

- journal articles and books
- individual scholars' web pages
- web pages developed by the researcher's' home institution (Hansen & Paul, 2015).

Scholars and researchers introduce their discoveries to the world in a formal system of information dissemination that has developed over centuries. Because scholarly research undergoes a process of "peer review" before being published (meaning that other experts review the work and pass judgment about whether it is worthy of publication), the information you find from scholarly sources meets preset standards for accuracy, credibility and validity in that field.

Likewise, scholarly journal articles are generally considered to be among the most reliable sources of information because they have gone through a peer-review process.

2.4 Conference Papers & Proceedings

Conferences are a major source of emerging research where researchers present papers on their current research and obtain feedback from the audience. The papers presented in the conference are then usually published in a volume called a conference proceeding. Conference proceedings highlight current discussion in a discipline and can lead you to scholars who are interested in specific research areas.

A word about conference papers: several factors contribute to making these documents difficult to find. It may be months before a paper is published as a journal article, or it may never be published. Publishers and professional associations are inconsistent in how they publish proceedings. For example, the papers from an annual conference may be published as individual, stand-alone titles, which may be indexed in a library catalog, or the conference proceedings may be treated more like a periodical or serial and, therefore, indexed in a journal database.

It is not unusual that papers delivered at professional conferences are not published in print or electronic form, although an abstract may be available. In these cases, the full paper may only be available from the author or authors.

The most important thing to remember is that if you have any difficulty finding a conference proceeding or paper, ask a librarian for assistance.

2.5 Dissertations and Theses

Dissertations and theses can be rich sources of information and have extensive reference lists to scan for resources. They are considered gray literature, so are not "peer reviewed". The accuracy and validity of the paper itself may depend on the school that awarded the doctoral or master's degree to the author.