Research Skills for Engineering Students

Module 2: Types of engineering information
Welcome to Research Skills for Engineering Students module 2, part 1, types of engineering information. In this section, you’ll learn how to evaluate and identify different types of sources.

Evaluating information
No matter where you get your information, you need to make sure you critically evaluate each source to ensure it’s appropriate for your research! Many publications have a particular bias or agenda, which may not be obvious at first glance.

Here are a few criteria that could help you in your evaluation:

● **Authority**
  o What are the author’s credentials and affiliation?
  o Who publishes the information?

● **Accuracy**
  o Based on what you already know about the topic or from reading other sources, does the information seem credible?
  o Does the author cite other sources in a reference list or bibliography to support the information presented?

● **Scope**
  o Is the source at an appropriate comprehension or research level?

There are other criteria to consider as well, such as currency, objectivity, and purpose. For more information, see UBC Library's [Evaluating Information Sources](#).

Popular vs. scholarly sources
Sources such as magazines, news stories, and blogs are known as **popular sources**. These aim to inform the general public, and are more informal in tone and scope.

Popular sources can be useful when looking for background or current information on a topic, although they aren’t generally considered scholarly.

There are many different types of popular sources, but in general, these sources:

● Are not written by subject experts
● Are written for the general public
● Have no or limited citations and references to their source information
● Include advertisements and graphics

Some examples of popular engineering sources include:

● [IEEE Spectrum](#), a trade magazine
● [The Globe and Mail](#), a newspaper
● [Gizmodo](#), a blog

On the other hand, **scholarly sources** are written by experts in a particular field, with the expectation the audience has a certain level of pre-understanding. They can include journal articles, conference proceedings, theses/dissertations, and others.
In general, scholarly sources:

- Are written by subject experts
- Are written for experts (researchers, post-secondary students, and so on)
- Have extensive citations and references to their source information
- Include figures, tables, charts, or graphs that generally focus on results

To see the typical components of a scholarly journal article, check out Anatomy of a Scholarly Article from North Carolina State University Libraries.

That concludes module 2 part 1. In part 2, you’ll learn more about different types of engineering information, as well as peer review.

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Welcome to Research Skills for Engineering Students module 2, part 2, types of engineering information. In this section, you’ll continue to learn how to evaluate and identify different types of sources.

**Primary and secondary sources**

Within engineering, **primary sources** report the findings of original research. They often describe a new theory or the results of experimental work.

Examples of primary sources include (but are not limited to):

- Journal articles
- Conference papers
- Technical reports
- Government publications
- Patents
- Theses/dissertations

Primary sources are often expected to form the bulk of the sources you incorporate into your report.

Within engineering, **secondary sources** review the existing literature, and often summarize, interpret, or evaluate the results found in primary sources. A familiar example of a secondary source is Wikipedia.

Examples of secondary sources include (but are not limited to):

- Books
- Review articles in journals
- Standards
- News reports
- Handbooks
- Manuals

Secondary sources are not as current as primary sources but are often useful for finding introductory material.

**The research cycle**

The ability to identify different types of sources will allow you to place resources you find in context.

The products of new ideas and research are published in primary sources, which are then summarized or evaluated in secondary sources. Because of this, research is often discussed in terms of a cycle - reading about a
subject might spark a new idea, thus beginning the research process all over again. Here you can see an engineering research cycle, including where primary and secondary sources fall in the process.

For more information, see Scholarly vs. Popular Sources from UBC Library.

Peer review

Not all scholarly sources go through a process called peer review.

Peer review is when an article is reviewed by other experts in the field before publication. This helps ensure that a published work is high quality, accurate, informative, and with reduced bias. Sometimes these are also called refereed publications.

But how can you tell if a publication is peer reviewed? There are a few ways to check:

- Use Peer Review filters
  - Many library databases and catalogues offer the ability to click a filter on the results page, which will limit to items that have been peer-reviewed or refereed
  - Use this feature carefully, because not every article that appears may be peer reviewed
- Use the publisher’s website
  - Look for information about the review process here
- Ask a librarian! We can help you determine if a source is a peer-reviewed one

That concludes module 2, types of engineering information. In the next video, you’ll learn some tips & tricks for effectively searching Google & Google Scholar.