

Most of us have near-constant internet access on our phones, tablets, laptops, or desktop computers. Such easy access to information may give an **illusion of knowledge**. It may be easy to forget that having information is not the same as understanding things and gaining knowledge over time. This type of accumulated learning is what a university education is all about.



One thing that such learning requires is access to the *right* information. For university assignments, that means having access to the most reliable electronic and printed sources of published information—the best academic articles, books, and other types of documents and publications you can **trust**.



While public search tools such as Google may give the impression that the most popular and readily-available information is best, for academic research you usually need to **dig deeper** into library databases, and often into the stacks of library books. Google can only provide access to some of the information on the internet—the tip of the iceberg. Information on the “deep web” is hidden below the surface. This includes electronic publications connected to the library website but available off-campus only by a university password. Special sites such as **Google Scholar** can get you started, but are not as comprehensive as the library databases found at lib.unb.ca.

Gaining knowledge also requires an investment of **time**—time to search out and find multiple sources of reliable information, time to critically evaluate your search results and closely read them, as well as time to prepare your paper or presentation. This guide aims to help you make the best use of your time, providing tips and techniques to help you successfully conduct library and information research, as well as pointers on appropriately incorporating your research findings into a research paper or other type of assignment.



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1. DEFINING YOUR TOPIC

Novice researchers often have trouble because their research topics are either too broad, too specific, or lacking context. Here are some “pre-research” tips:

Write your topic as a specific question.

Research should generally be a **journey of discovery**, not an attempt to locate a predetermined answer. Writing out your research topic as a specific question may help to focus your information search. For example, your general topic may be *home care*. One specific research question you could ask is “*How has home care for the elderly in Canada changed over the past twenty years?*” It is okay if this question evolves or changes as your research progresses. Consult your professor about the questions you need to ask for your particular assignment.

Recognize the subjects covered by your research question.

Information in libraries and library databases is usually organized according to broad subjects. These broad subjects often correspond to university departments or faculties (e.g., Sociology, Nursing, etc.). However, subjects are interrelated, so you should not limit yourself to just one section of the library, its website, or one library database. Our *home care* question relates to several subjects, including nursing, history, sociology, and gerontology.

Get some background information.

A basic understanding of your topic will help you with your search. You may also find additional aspects of your topic that you would like to investigate, or words related to your topic that you will be able to use as keywords in your search. Your textbook may provide some background. You may also need to consult a reference source, as explained below.

2. UNDERSTANDING ACADEMIC LITERATURE

Understanding the form of some major types of academic publications will help your research:

Reference Sources

When beginning a new area of study, it is often necessary to get an overview of a topic, explanations of unfamiliar terms, or brief factual information. Reference sources, such as encyclopedias, dictionaries, and handbooks, provide quick access to this type of factual or background information. An academic encyclopedia article may provide an especially useful starting point, since it will not only give a concise overview of your topic and provide a broader context, but it will also likely provide a bibliography of key information sources. Go **beyond Wikipedia**—the library has hundreds of more reliable academic encyclopedias online and in print.

Books and Documents

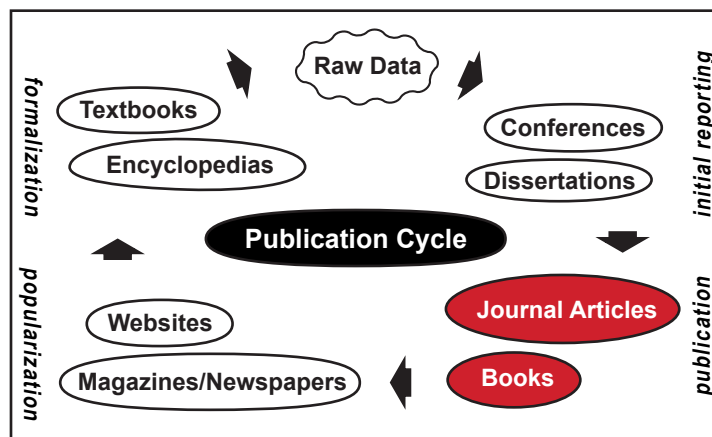
Research results are often eventually published in monographs—books which provide an in-depth overview of a topic, or in collections of essays covering different perspectives of the topic. Many academic books are published by university presses (e.g., University of Toronto Press). Academic libraries also often have many government documents, which contain the results of research carried out by or for governments.

Articles

The most current academic information can often be found in journals, which periodically publish new research articles in a specific subject area. Scholarly journal articles are crucial to academic research in most disciplines, as explained in Section 3.

The Scholarly Publication Cycle

Scholarly communication generally flows through a publication cycle, which includes the major publication types mentioned earlier. Typically, information starts as a researcher's raw data (top of diagram), moves from being communicated informally (conferences) to more formal reporting and publication (dissertations, journal articles, books), and then often becomes popularized (magazines, newspapers, websites) and generalized or formalized (encyclopedias, textbooks).



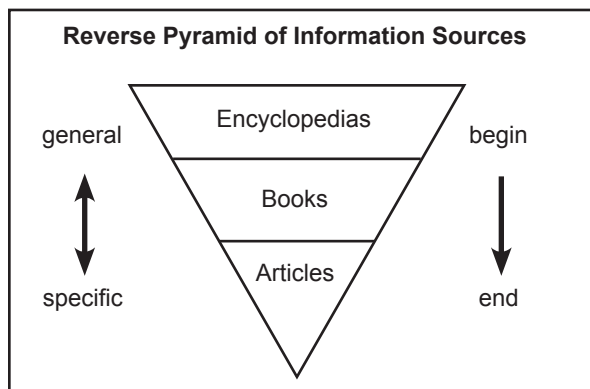
You should note, however, that this is a simplified diagram. Information also flows counter-clockwise, it does not always take every form identified, and the process varies from discipline to discipline. For example, some academic writers have never written a PhD dissertation, while others have written many journal articles but will never write a book, or vice versa. Yet, understanding the general evolution of information will help you to access and evaluate it effectively. Especially note the position of **articles and books** in the process—the publication of academic journal articles and books typically takes place only after a considerable amount of work, and before the information becomes a part of common and accepted knowledge.

Primary vs. Secondary Sources

The publications that make up the publication cycle can be either *primary* sources of information or *secondary* sources. Although exactly what constitutes a primary or secondary source varies by discipline, there are some general differences between the two types of sources. A primary source is an original document written during the time under study or raw data resulting from original research. For example, diaries, autobiographies, e-mails, newspaper articles, and journal articles that provide primary reports of research are all primary sources. Creative works, such as novels or music, may also be primary sources, as are the original writings of scholars and academic theorists whose works have subsequently been studied by others. Secondary sources, on the other hand, are documents that analyze events or primary sources. They are removed from the time of the original event, and they interpret or discuss the original event or data. Examples of secondary documents are textbooks, encyclopedias, and journal articles that interpret events, discuss data, or review the literature on a topic. In fact, many publications found in academic libraries (outside of special sections such as archives, newspaper rooms, literature collections, etc.) are secondary sources.

Where to Start

So, what type of publication should you start with? Follow the “reverse pyramid” method. Start with the most general information and then move on to publications that tend to be more specific. This usually



means starting with a quick reference tool like an encyclopedia to get an overview of your topic, then going on to more in-depth books, and finally getting to the more specific (and likely more technical) journal articles last. The publications listed above can be found by using various search tools—databases on the UNB Libraries' website which let you discover different types of publications. Try a subject guide for your research area, which will direct you to librarian-recommended tools and other information sources. From lib.unb.ca, look under:

Subject and Course Guides

3. SEARCHING DATABASES

Unlike public search engines such as Google, library databases usually find only exactly what you ask for. Therefore, you need to use some specific search techniques, which are generally available in most databases.

Using Keywords and Boolean Operators

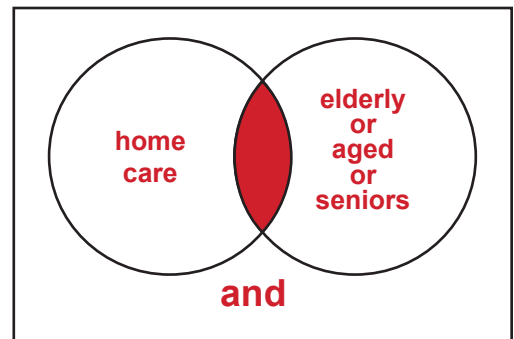
You will need to convert your research question into keywords. You may need to think of alternate words, or synonyms. It may be necessary to combine keywords with either an **and** or an **or** Boolean operator. Use *and* when you want each concept to be present in the documents you wish to retrieve. Use *or* when you want either concept to be present, or when using synonyms. If more than one operator is used, brackets should be used to “nest” terms, or group them together. For example, a keyword search using the concepts of *home care* and *elderly* could look like this:

home care and (elderly or aged or seniors)

This will find publications dealing with home care of the elderly, even if the document uses the word *aged* or *seniors* instead of *elderly*. In the diagram on the right, each circle represents a concept, and the area where the circles overlap represents the search results, or “hits.” Many databases also allow use of the **not** operator, which will exclude concepts, as in this example:

home care not plumbing

Some databases use the plus sign **+** instead of the word *and*, or in order to force an exact word search, as well as the minus sign **-** instead of *not* to exclude terms.



Subject Headings/Descriptors

In addition to searching by keywords, you should consider using each database’s preferred subject terms, sometimes called *subject headings* or *descriptors*. For example, the sociology indexing database, Sociological Abstracts, prefers the term *elderly*, while the library catalogues prefer *aged* or *older people*. Using the proper subject terms will help to ensure you get all the relevant publications in the database, and will also prevent you from getting irrelevant hits. Some databases have an online thesaurus which contains the subject terms, while others allow you to browse and select subject terms.

*Truncation **

Truncation is the process of abbreviating or shortening a keyword to its stem in order to retrieve all possible word variations. Most databases will let you find variations of a word using a wildcard symbol, usually an asterisk (although the Quest catalogue requires the \$ symbol). For example, typing *gerontolog** would retrieve *gerontology*, *gerontological*, etc. But be careful not to truncate a word too far. Typing *ger** would also get you information on geraniums, germs, and Germans.

Exact Phrase Searching “ ”

It has been assumed in the above examples that a database will search *home care* as a phrase, and not as two separate keywords. However, some databases (e.g., those provided by EBSCO) would automatically put an invisible *and* between the words, and require double quotation marks around phrases (e.g., “*home care*”).

Field Searching/Limiting

Field searching is used to specify the type of keyword you are entering. For example, a person may be searched as a subject, rather than as an author, by clicking or selecting “subject.”

4. EVALUATING YOUR RESULTS

When conducting library and information research, you will probably find a lot of information—perhaps lists of hundreds of publications. How can you choose the best? Here are some basic things to consider:

- **Author's qualifications** (Is s/he affiliated with a university or research organization?)
- **Publisher** (Is it a university press, for example?)
- **Publication date** (Do you require the latest information, or a classic or standard text?)
- **Length** (Is the publication too brief? Too detailed?)
- **References** (Are there any? Most good research publications list their sources.)
- **Subject/content details** (Are there any? Abstracts, subject headings, descriptors, tables of contents?)
- **Peer review** (Unlike magazines, scholarly journals use this rigorous publication process—see below.)

Also consider how the publications compare with the general body of academic literature in the subject area. It is usually best to **research broadly** to ensure you find a range of perspectives which represent academic thinking on your topic.

Along with academic books, scholarly journals are especially important information sources. Scholarly journals are not like **magazines, newspapers**, or many types of **popular websites**. Sometimes popular magazines, newspapers, and websites report on research that has been published in scholarly journals, but popular articles themselves are not normally the best sources of information since they usually have no peer-review process, and therefore provide little guarantee that their information is reliable.

How can you tell the difference between scholarly and popular sources? To begin with, scholarly journal titles often contain words such as *journal*, *bulletin*, *review*, and *quarterly*. But there are several more differences:

SCHOLARLY JOURNALS

Articles in **scholarly journals** are important sources of current expert information, since they contain the results of recent academic research. In addition, over time their publication has a cumulative effect—scholarly journals are largely responsible for building each academic discipline's body of recorded knowledge, or literature.

Scholarly journals are also called academic journals, research journals, peer-reviewed journals, refereed journals, juried journals, or simply journals. Articles in scholarly journals are usually peer-reviewed, meaning they have been evaluated and edited by the author's international, professional "peers," a group of subject experts who are usually professors or other academic researchers in the specific subject area.

CRITERIA	SCHOLARLY JOURNALS	MAGAZINES, NEWSPAPERS, AND WEBSITES
Purpose:	report independent research findings	provide information at a profit; sell ads
Audience:	scholars, researchers, professionals	general public
Author:	from research organizations (often PhDs)	often no credentials necessary
Tone:	formal, scientific, technical	informal
Validation:	references or citations	often no references provided
Layout:	long articles, often mostly text	shorter, many illustrations
Availability:	academic libraries, internet	bookstores, newsstands, internet
Examples:	<i>Canadian Journal of Sociology</i>	<i>Maclean's</i> , NYTimes.com, Wikipedia

A third category of periodicals, called **trade journals**, are found in many subjects, especially the professions, such as nursing, criminal justice, social work, education, and business administration. Trade journals can also be called *professional journals*, *practitioner's journals*, or *trade magazines*. Trade journals are not like scholarly journals or popular magazines, but they can be viewed as falling between the two. They are intended for working professionals or managers in a particular field. Articles from trade journals tend to be easy to read, and they often point to specific research findings, but they may not be as reliable as scholarly journal articles.

5. RETRIEVING & READING PUBLICATIONS

Retrieving Books and Other Documents

Use the *location code* (e.g., HIL-STACKS: Main Collection) and the *call number* (e.g., HM836 .A67 2010) to find the publication on a library shelf. You can then check it out, according to the library borrowing policy. The full contents of e-books can be viewed online, while portions can be printed. If you are looking for a publication that is not available electronically or in the library in print, you can request it via *Document Delivery* (lib.unb.ca/requests/docdel). Library staff will attempt to locate a copy of the book at another university library. After a short while, the book will be available for you at the library's front desk.

Retrieving Articles

Within an article database, you may find a link to the fulltext of the article. You may be able to print, e-mail, or save a copy of it, depending upon the specific journal or database. When starting with a full reference obtained elsewhere, you can look up the journal title in the library's online *Journals & Newspapers* listing or in the library catalogue. If the volume and issue of the journal is not online nor at the library in print, you can submit a *Document Delivery* request (lib.unb.ca/requests/docdel). Library staff will attempt to locate the article at another university library and email it to you as soon as possible, often within a few days.

In addition, special services are available for off-campus students; for more information, see lib.unb.ca/disted.

Browsing for Books

Books in libraries are generally shelved by subject, often using the *Library of Congress* classification system. If you find a good book on your topic, chances are there are more nearby. But keep in mind that the most appropriate books may be shelved with another subject in an entirely different area of the library. Consult the "library classification system" bookmark available at the library, or ask a staff member for directions.

Browsing for Articles

While an article database is normally the best place to do a search by topic, if you only need one or two articles you can go to an individual e-journal or group of e-journals and browse the contents, or search within a specific title. Similarly, if you know the titles of a few print periodicals in your subject area, you can head straight for the library shelves, and browse tables of contents. Note that the newest periodicals are usually kept separate from the older bound periodicals.

Another form of browsing is bibliography surfing, in which you look up or link to referenced sources at the end of publications. You can focus on a specific list of key or recommended sources, or surf through the web of interconnected citations in the literature.

READ IT!

Take the time to carefully read the key information sources you find, not just skim or scan them. You may need to "unplug" and find a quiet corner of the library. Many students prefer paper for in-depth reading, as opposed to reading on screen. Whatever format you use, think carefully about the arguments and issues presented by the author. Keep in mind that any subject expert who reads your research assignment (such as your professor) will likely be able to tell whether or not you have fully and critically comprehended the sources you reference.

KEEP NOTES!

Your research will probably be an evolving process. It may be necessary to revisit and revise your search strategy as you find out more about your topic. Keep a record of your search (with words or phrases exactly as entered), the names of the databases you used, and the date of your search, or save your searches online, if that is an option in the databases you use. Don't waste time figuring out the same thing twice!

6. WRITING YOUR PAPER & BIBLIOGRAPHY

Writing Help

There are several standard writing guides at the library. For quick reference, see the UNB Libraries' plagiarism bibliography at lib.unb.ca/research/PlagiarismBibliography.html to find a recommended list of titles kept at the Harriet Irving Library's Research Help Desk. You may also wish to check out the *UNB Writing and Study Skills Centre's* website at unb.ca/fredericton/studentervices/academics/writing-centre/, which has online writing guides. UNB students can contact the *Centre* (basement of CC Jones Student Services Centre) either by phone (452-6346) or by email (wss@unb.ca) to make an appointment for a tutoring session. St. Thomas students can visit the STU Writing Service (Edmund Casey Hall, Room 102).

Avoiding Plagiarism

In academic writing, if you copy or paraphrase another person's words, or adopt his or her ideas or data, without giving credit by citing the source, you are plagiarizing—whether you had intended to cheat or not—and universities do not take plagiarism lightly. The possible consequences range from an awkward confrontation with your instructor to expulsion from university. Therefore, the best approach is avoidance. For more information on how to avoid plagiarism, consult the UNB Libraries' *Plagiarism: A How-NOT-to Guide* at the library or online at lib.unb.ca/research/Plagiarism.html.

Preparing a Bibliography

When writing a paper, you normally have to list the publications you used in a bibliography or list of works cited. A good bibliography will usually have a variety of types of publications, and will follow an accepted style. Your professor may request that you use a particular style manual which will explain, with examples, how to format a reference. Standard manuals are used in different disciplines:

- Social Sciences:** *Publication Manual of the American Psychological Association* (called "APA")
- Humanities:** *The MLA Style Manual*, or *The Chicago Manual of Style* (also used in the "Turabian" manual)
- Sciences:** *Scientific Style and Format* (called "CBE" or "CSE")

All manuals are available at UNB Libraries (see lib.unb.ca/research/PlagiarismBibliography.html), and very brief citation style example sheets are also available at the libraries or online at lib.unb.ca/research/citing.php.

Also consider using **RefWorks**, which can automatically format citations in any standard style. As you conduct your online research, you can export citations to your own RefWorks database, and later use RefWorks to automatically format your bibliography. See lib.unb.ca/RefWorks for details. If you are using article databases from CSA (e.g., Sociological Abstracts, etc.), you also have the option of directly creating a formatted bibliography using **QuickBib**.

All the standard styles have specific methods for citing electronic publications. An e-journal article, for example, should not be listed as if it were found in print form. Some styles require that citations to electronic publications declare *where* and *when* you retrieved the publication.

Keep in mind that the whole point of a bibliography is to provide another person with enough information to find the publications. Your professor will not be pleased if s/he cannot find items in your bibliography!

7. GETTING HELP

Research Help Desk ~ Harriet Irving Library

Location: Learning Commons

Email: askus@unb.ca

Phone: 506-453-3546

Instant Message: lib.unb.ca/help/ask.php



Other Libraries

Science & Forestry Library

Phone: 506-453-4601

Email: scilib@unb.ca

Engineering Library

Phone: 506-453-4747

Email: englib@unb.ca

Law Library

Phone: 506-453-4734

Email: lawlib@unb.ca

UNBSJ Library

Phone: 506-648-5700

Email: wcl@unb.ca

Subject Librarians

lib.unb.ca >>

Subject and Course Guides

>>



Ask a Librarian

In addition to helping provide general service at the *Research Help Desk*, these librarians provide advanced or specific research help in their subject areas. For contact information, see one of the subject guides, or ask at the *Research Help Desk*.

COMMON RESEARCH MYTHS

“Google will find everything I need.” Search tools such as Google make it easy to find some information, unfortunately including unreliable information unsuited to academic research. On the other hand, these public search tools cannot access material in many regions of the “deep web.” For example, Google cannot find research articles within the library’s collection of thousands of e-journals, or the contents of the library’s many e-books. **Google misses a lot of the good stuff, and includes a lot of the bad.**

“The library is all online.” Although the library does have an extensive collection of e-journals and other electronic resources, and there is a lot of other good material out there on the internet, there is a vast amount of important research material in the world that is only available in print form. UNB Libraries, for example, have nearly 1.5 million print volumes in their combined collections. **Books are still important.**

“The library has only good academic material.” The library supports the full range of teaching and research at UNB and STU, and also provides some general interest material. This means we do have some popular books and videos, children’s literature, newspapers, and magazines—both in print and online. Do not assume that everything you find on your topic at the library will be academic in nature or useful for your specific research purpose. **Critically evaluate everything you find.**

“Doing research is quick and simple.” While information is much more accessible today than it was when your professor was a student, do not assume that you will be able to find everything you need for your term paper in an hour or two. As a general rule, expect the research process for your paper to take about three times as long as the writing process. **Start your research early.**



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An interactive web version of this guide is available at lib.unb.ca/research/success.html

A printer-friendly PDF version is available at lib.unb.ca/research/success.pdf