Module 2

Introduction

Whether you are searching for traditional library resources or using electronic resources available over the Internet, the development of a search strategy is essential. A search strategy is simply a plan for conducting an information search. The process begins with selecting a general topic, focusing the topic so that it is appropriate for the assignment by narrowing or broadening, creating and refining search statements, deciding which resources are appropriate to search, revising search statements appropriate to the resource, and finally conducting the information search.

Selecting A Research Topic

Before attempting to search for Internet resources, you should have a clear idea of your topic and the kinds of information you will need.

To identify a research topic, try:
- Suggested topics from instructors, texts, or readings
- Your own business, hobby, sports, or personal interest area
- A site like Hot Paper Topics, which compiles a list of common topics seen in college level courses.

The following sites may also be helpful.
- Frontline
- PBS News Hour
The following library databases might also be consulted. These are subscription databases which require a student to log in with a Borrower ID number and PIN. Library databases will be discussed in more depth later in this course.

- CQ Researcher
- Issues and Controversies
- Opposing Viewpoints in Context

One of the most common problems in trying to come up with a topic is narrowing a broad subject to a topic that is specific enough to handle within the constraints of a research paper. The following list provides three subjects and some possible topics within each subject.

**Subject: Alternative Medicine**
Topic: Can hypnosis cure disease?
Topic: Should insurance companies reimburse patients who use "unproven" treatments?
Topic: Does the interest in alternative medicine suggest that conventional medicine is failing?

**Subject: Animal Rights**
Topic: Should animal tissues and organs be transplanted into human beings?
Topic: Is animal dissection or vivisection still necessary as a teaching tool?
Topic: Should animal experimentation for cosmetics be abolished?

**Subject: Home Schooling**
Topic: Does home schooling isolate children socially?
Topic: Should home schooling parents be required to be certified in the subjects they teach?
Topic: Should public schools offer extracurricular activities for homeschooled children?

A specific topic may not be obvious when you first start a research project. You may need to practice some of the activities outlined in this module, where you will purposefully attempt to narrow and focus your topic.

**Focusing Your Topic**

You may need to begin your research project by using resources such as encyclopedia articles or books to gain a basic understanding of the scope of your topic. Look at the basic concepts or ideas your topic involves and decide whether you need to focus on a specific aspect of the subject. You may need to narrow or broaden the scope of your topic. The Internet Public Library provides a guide on [Looking For and Forming a Focus](#).

One basic source for background information on research topics is [Encyclopedia.com](https://www.encyclopedia.com), a group of encyclopedias that offer a free abridged version on the Internet. There are also
a number of specialized encyclopedias available either on the Internet or accessible through your local library system. Articles written in an encyclopedia often give a good general introduction to a topic.

**My Facts Page:** Encyclopedias at [Refdesk.com](http://Refdesk.com) provides a list of online subject encyclopedias.

*Wikipedia* is a free online encyclopedia created and maintained by users. Because the authors are unknown and entries can be edited by anyone, credibility of the content is sacrificed. Read their disclaimer [here](http://here). The pros and cons of Wikipedia will be discussed in more depth later in this course.

**Questions to help you state a topic:** When selecting your topic, consider the following questions.

- What terms and keywords are frequently used to describe the topic?
- What dates are important to the topic?
- What specific places are important to the topic?
- What important events are related to the topic?
- Which people, groups or organizations have made a significant contribution or have been involved in some way with the topic?
- Which subject or discipline is the topic part of?
- Are there any conflicting views or controversies surrounding the topic?

As you answer these questions by thoughtfully examining your topic, you will be building a body of search terms, concepts, and ideas that will help you engage in productive research as you continue with the process.

You may also need to visit your local library or search an online library catalog to find background material, usually in books, for your topic and to get a sense of how much information will be available on the topic.

- **LINCCWeb** provides access to all of the Florida Community and State College library catalogs, and specifically to Indian River State Colleges’ databases. Items may be requested by current students from any of the statewide collections.
- **The State University Libraries of Florida** provides access to eleven of the Florida State University library catalogs.
- **WorldCat** provides links to library catalogs worldwide.

**Interlibrary Loan:** Indian River State College offers interlibrary loan services that allow you to borrow materials located in remote library catalogs. It may take a week or so to borrow material via interlibrary loan so begin your research early. In addition, any student enrolled in a state institution of higher education in Florida has reciprocal borrowing privileges at all community college libraries and all state university libraries.

**Searching the online catalog:** As you peruse the online catalog for books and material
in alternative formats, consider the following questions:

- Approximately how many titles are in the online catalog on your topic? What, if anything, can you tell from the listed titles, dates and authors?
- Are there subheadings displayed for the topic?
- Are cross-references or alternative headings displayed for the topic?
- Will your local library be able to support your topic, or will you need to get material from other libraries through interlibrary loan?

**Stating Your Topic As A Working Thesis**

As you begin to develop a thesis for your research project, it is important to note the difference between a topic and a thesis. A topic is a general area of inquiry and is frequently stated as a question; a thesis is more specific and can be defined as an opinion statement. Purdue University has some examples and helpful hints for writing a thesis statement on their [Online Writing Lab (OWL)](https://owl.purdue.edu) website.

At this early point in your research, you can expect the thesis statement to be a preliminary or working one. As you learn more about your topic, you will be able to revise the thesis. The working thesis will help keep you on track as you research your topic. The following illustrates some topics and preliminary thesis statements.

**Topic:** What effect does the use of alcoholic beverages have on college students?

**Thesis Statement:** College students who are binge drinkers are more likely to engage in risk-taking behavior than students who are either moderate drinkers or who abstain from drinking alcohol.

**Topic:** Should animal tissues and organs be transplanted into humans?

**Thesis Statement:** The potential medical benefits of xenotransplantation outweigh any ethical concerns the public may have.

**Topic:** What effect does television violence have on children?

**Thesis Statement:** The implementation of V-chip technology to block violent or sexually explicit television content will reduce the incidence of school violence.

**Creating Search Statements--Identifying Keywords**

The next step is to create a search statement, also called a search string, which you will use to search for appropriate resources. First, identify the main concepts or keywords in your preliminary thesis.

By creating a list of keywords, you can increase your search capacity. This enables you to find more information on your topic. Try to think of all the ways your topic could be
described. For example, if you are researching on acid rain, you might also use words like pollution, air pollution, carbon dioxide levels, ozone depletion, etc.

Choose your keywords carefully. Do not use a complete sentence or phrase as you do in spoken natural language. Leave out minor words, such as articles ("a", "an", or "the"), and prepositional or verb phrases ("on...", "in...", or "going to..."). Stick to the keywords, usually nouns or noun phrases that express the major concepts of your thesis.

For the thesis, "College students who are binge drinkers are more likely to engage in risk-taking behavior than students who are either moderate drinkers or who abstain", you might choose the nouns and noun phrases alcohol, alcoholic beverages, binge drinking, risk-taking behavior and college students as keywords. For the thesis, "The implementation of V-chip technology to block violent or sexually explicit television content will lessen the incidences of school violence", you could use television, TV, V chip, school violence and children.

As you begin your search, you should write down all search terms so you can decide which were effective and which were not. You may find terms you wish to eliminate from your results list or terms you want to always appear in your results.

To identify alternative keywords, use a thesaurus (Webster's Collegiate Thesaurus is available online), check the Library of Congress Subject Headings, a reference book available in most libraries, or try browsing or searching web subject directories you will learn about later in this course. The subject directories may provide alternate keywords or related topics that you wouldn't necessarily think of on your own.

**Refining Search Statements**

The next step in developing your search statement is to refine your keyword search string. This may help to narrow or direct your search so that you retrieve the most relevant results. When results are relevant, they are on target or very close to the information being sought. Complex search statements could be refined by adding words and characters such as Boolean operators, quotation marks to indicate exact phrases, truncation symbols, or field search limiters.

**Boolean Searching**

Boolean searching is based on a system of symbolic logic developed by George Boole, a 19th century English mathematician. Most computer databases and Internet search engines support Boolean searches. Boolean search techniques help reduce the number of irrelevant documents in the search results.

The power of Boolean searching is based on combinations of keywords with connecting terms called Boolean operators. The three basic operators are the terms AND, OR, and NOT. Many general search engines, such as Google, replace Boolean operators with symbols, for example + for AND, - for NOT.
**AND** narrows a search, requiring that two or more keywords appear in a document.

**Topic:** Safety of automobile air bags.

**Boolean Search Terms:**

```
  air bags  AND  safety
```

Documents from the intersection of two sets are returned because both keywords appear in each document.

**NOT** eliminates unwanted terms from search results.

**Topic:** Information on gambling but not lotteries

**Boolean Search Terms:**

```
  gambling  NOT  lotteries
```

Documents from the non-intersecting set *gambling* are retrieved because each document contains only the word *gambling* but not the word *lotteries*.

**OR** broadens a search to include terms that can be used interchangeably or mean the same thing.

**Topic:** Attention deficit disorder

**Boolean Search Terms:**

```
  ADD  OR  Attention deficit disorder
```

Documents from the union of both sets are retrieved because each document contains at least one of the search terms.
The examples above illustrate general topics expressed with just two keywords. Actual search strings, which express complex topic ideas, may consist of several keywords and combinations of Boolean operators.

For example, the thesis statement "Automobile air bags are not safe for children" might result in the search string:

automobiles AND air bags AND children AND safety

**Nesting**

Most databases and major search engines support complex Boolean searches. If you have a complex search using more than one operator, you can nest your search terms, using parentheses. Search terms and operators included in parentheses will be searched first, then terms and operators outside the parentheses. A search for:

(ADD OR attention deficit disorder) AND college students

will search for documents containing either the acronym ADD or the words *attention deficit disorder*, then narrow the search results only to those documents that also contain the words *college students*.

**Phrase Searching**

Pay attention to phrases in search strings. If you are looking for information on the *capital gains tax*, you need to enter that part of your search string as a phrase. Otherwise, you may retrieve irrelevant documents which contain all of the keywords, in any order, anywhere in the document. Most search engines and databases support phrase searches. Internet search engines usually require quotation marks to indicate exact phrases such as: "capital gains tax", "physician assisted suicide", "human genome project".

**Truncation**

Another useful search parameter is truncation. Truncation allows the searcher to insert a truncation symbol, usually an * or ?, as a wildcard at the end or the middle of a word. For example, the search term teen* will locate the terms:

- teen
- teens
- teenager
- teenagers
- teenaged
- teen
- teeny

Try not to use truncation on a very short root word as too many words would be retrieved, and the relevance of the search would be affected. Some search engines automatically truncate your search terms to find plural, -ing, or -ed endings. Truncation
symbols will vary. Some search engines and databases do not support truncation.

**Field Searching**
Field searching is a technique that allows you to search a particular part of a computer record. For example, in many search engines and electronic databases, you can specify that a specific word in your search string be found in the title of the document.

You may also be able to search for an author's last name, a range of dates, full-text documents, or material in a particular language. In web search engines, you may be able to search by domain name, URL, or type of file (picture, sound or video). This search technique works efficiently when you need to narrow your search in a very specific way. Some web search engines make field searching available only in the advanced search mode.

**Deciding Which Resources to Search**
Once you have identified the keywords for your topic and have created search statements that reflect the relationship between the keywords, you should also consider the types of resources that will be most appropriate for your topic. Often your professor will require that certain types of resources be used. Both free Internet resources and library-based electronic resources can be used to access a wide variety of types of information.

You may be required to use scholarly or peer-reviewed publications in addition to popular resources. Depending on your research project, primary source documents may be essential. The discipline area in which your search topic falls may require that the information be current. Finally, you may need to access information from a variety of different formats such as audiovisual, graphical or raw data.

**Scholarly vs. Popular**
Professors will often require that students use a certain number of scholarly resources for research projects. Scholarly information will present original research findings and provide much more detail and usually a better understanding of a topic than will a popular or general interest publication. In some cases, deciding what is a scholarly publication versus what is a popular publication may be easy, especially when considering print sources; in other cases it may be more difficult to make the distinction. Some of the distinguishing factors that are obvious in a print source (e.g., price, availability, etc.) will not be relevant for an electronic publication. Use the following table as a guide to help differentiate between popular and scholarly publications/Internet sites.
<table>
<thead>
<tr>
<th></th>
<th>Popular Sites</th>
<th>Scholarly Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AUDIENCE</strong></td>
<td>General readers</td>
<td>Scholars, researchers, professors, students</td>
</tr>
<tr>
<td><strong>APPEARANCE</strong></td>
<td>Colorful, eye-catching, engaging, lively, slick</td>
<td>Attractive but also serious</td>
</tr>
<tr>
<td><strong>ADVERTISEMENTS</strong></td>
<td>Many, colorful; banner ads that change on a regular basis</td>
<td>Few, if any, advertisements</td>
</tr>
<tr>
<td><strong>PRODUCER</strong></td>
<td>Commercial organizations, non-profit organizations, personal home pages</td>
<td>Universities, individual faculty pages, professional associations, some commercial or non-profit organizations</td>
</tr>
<tr>
<td><strong>AUTHOR</strong></td>
<td>Staff writers, journalists, usually not experts, web sites are frequently unsigned</td>
<td>Professionals, experts in the field, credentials given with the site</td>
</tr>
<tr>
<td><strong>CONTENT &amp; FOCUS</strong></td>
<td>Non-technical, informative, introductory information, entertaining, news oriented, opinions</td>
<td>Original research, specific narrow focus</td>
</tr>
<tr>
<td><strong>LANGUAGE, STYLE</strong></td>
<td>Easy to read, engaging</td>
<td>Formal language, specialized jargon used, requires prior knowledge of the subject matter</td>
</tr>
<tr>
<td><strong>LENGTH</strong></td>
<td>Usually short to medium in length, providing broader overview of topics</td>
<td>Usually rather lengthy in order to provide in-depth analysis of a topic</td>
</tr>
<tr>
<td><strong>ILLUSTRATIONS</strong></td>
<td>Heavily illustrated, photographs, eye-catching</td>
<td>Few illustrations, little or no color, will include appropriate research oriented tables, charts, and graphs</td>
</tr>
<tr>
<td><strong>DOCUMENTATION</strong></td>
<td>Very little documentation, if any</td>
<td>Documentation, bibliographies, footnotes</td>
</tr>
<tr>
<td><strong>TIMELINESS</strong></td>
<td>Up-to-date</td>
<td>Timeliness is not as important; thoroughness, originality, and in-depth analysis</td>
</tr>
<tr>
<td><strong>WORDS IN TITLE</strong></td>
<td>No specific words included or excluded; titles may be cutesy or contain slang</td>
<td>Titles may use language of the discipline; frequently words such as research or study will appear in the title</td>
</tr>
</tbody>
</table>
Primary vs. Secondary
Depending on the general subject area or discipline of your research, primary sources may be a major focus. Primary sources take different forms depending on the discipline. In literature, a primary source is the novel, short story, poem, etc. Primary sources in history include laws, letters, oral histories, diaries, and newspaper articles on events. In science, primary sources include reports of original research. Primary sources tend to stand on their own and be firsthand observations of an event.

A secondary source is one which analyzes, critiques, reviews or explains a primary source. They are often authored by people who were not present when the event occurred or the person under study was alive. Many are written by scholars who have carefully studied the primary source and have drawn their own conclusions from it. One type of source is not, by nature, more or less reliable than the other. Some examples of both primary and secondary sources follow.

<table>
<thead>
<tr>
<th>Primary Sources</th>
<th>Secondary Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Autobiography of Charles Darwin</td>
<td>Darwin Remembers: A Play by Fred Sandford</td>
</tr>
<tr>
<td>Plato's Republic</td>
<td>Stanford Encyclopedia of Philosophy: Plato</td>
</tr>
</tbody>
</table>

Current vs. Historical
For some disciplines, timeliness or currency of information is crucial. In the sciences and medicine, it is very important that the most recent information on a topic be retrieved. In history or literature, currency may not be as important. Frequently, professors will place time limitations on assignments and this will help guide your research. Some search engines and library-based electronic databases will allow you to specify a time frame for a search.

All databases will allow you to refine your results by publication date. If you have a topic in a medical or technical field, you probably will not want sources older than 5
years from the current date, as the information may become outdated or superseded quickly. Conversely, if your topic concerns a historic event, for instance, coverage from a hundred years ago is likely as valid as present day research.

**Resources By Discipline**
Information is organized into disciplines or subject areas. The discipline or subject area in which your research topic falls will have a bearing on the type of research you will do. In addition, the same research topic you choose for a general composition class in which you primarily retrieve Internet sites and articles from library-based general electronic resources will take on a very different flavor in an upper-level discipline-based class.

Depending on the discipline area, the following considerations may be important:
- One or more organizations may be responsible for the dissemination of information.
- There may be a standard terminology for the discipline.
- There may be a standard index for the discipline.
- Scholarly resources may be preferred over popular resources.
- Primary resources may be preferred over secondary resources.
- One or more of the following investigative methods may be preferred:
  - laboratory experiments
  - simulations
  - field work
  - interviews
  - surveys
  - statistical analysis
  - tests and measurements
  - original thought and analysis
- Current resources may be preferred over historical resources.

**Resources By Format**
Since research material on the Internet is available in many different formats, you may find that an audio file, an image, or a video clip may be appropriate for your research topic. For example, if you were required to make an oral presentation of your research project in addition to a written report, and you were going to create a presentation with PowerPoint, you might find it helpful to import audio files, images and video clips into the presentation.

**Revising Your Topic and Searching**
Research is seldom a neat, tidy process. Sometimes your first search attempt will not give you the results you anticipate. You may either find too much information on your topic, not enough information on your topic, or the information you find may not be helpful. In this case, it may be necessary to change or redesign your topic question or statement.
One of the most common problems encountered in research is retrieving search results that are too broad or unrelated. In that case, you will need to rethink your search strategy to limit your search results.

Try the following to narrow and define your search:
- Use the AND Boolean Operator to add relevant terms to the search.
- Use the NOT Boolean Operator to eliminate terms from the search.
- Search for one or more words in the title field as opposed to searching throughout the full-text of a document.
- Use phrase searching to define your search terms.
- Use vocabulary that is more specific.
- Choose a narrower category of a major topic.

When there are too few sources on your topic, try the following to expand or broaden your topic:
- Combine synonymous terms with the Boolean OR Operator.
- Use wildcards and truncation to retrieve alternate spellings or endings of root words.
- Think of the topic in broader terms and use a more general vocabulary.
- Make sure you are using the appropriate vocabulary for the discipline in which your topic falls.
- Eliminate the least important concept to broaden the search.
- Revise the date range. Perhaps your topic is so new that there is not much scholarly information available yet.
- Try the option available in some search engines that will look for related documents to one or more of your relevant hits.
- Use a thesaurus.

**Finalizing Your Thesis**

Now that you’ve done your initial searching and decided on a firm direction for your topic, you are better equipped to revisit your thesis to make it stronger.

A strong final thesis should be:
- Focused on a single position or point of view in your thesis statement. Addressing too many ideas in a project is likely to make your point muddy and incomplete.
  - Weak thesis: Underfunded arts programs, underpaid teachers, and standardized testing are all factors in underachieving students in public schools.
  - Stronger thesis: The emphasis on standardized testing is a critical factor in the underperformance of public school students.
- Clear and concise. Present your argument or point precisely without generalizations.
  - Weak thesis: The lack of funding in public schools is a major issue in the
American education system.
  • Stronger thesis: Underfunding arts programs in public schools does not adequately prepare students for college.

- Declarative, explaining your position or point-of-view as a statement rather than a question.
  • Weak thesis: Does car exhaust impact climate change?
  • Stronger thesis: Car exhaust is a leading contributor to climate change

- Written in third-person voice. Rather than addressing “I”, “we”, “you”, “my”, or “our” in your thesis, look at the larger issues that affect a great number of participants. Think in terms like “citizens”, “students”, “parents”, “teachers”, “artists”, etc.
  • Weak thesis: I think using your cell phone while driving is the leading cause of traffic deaths for people in my age group.
  • Stronger thesis: Cell phone use is the leading cause of traffic deaths in teenagers.

A Sample Research Problem

The following is a sample research topic and a thesis statement that illustrate how a researcher might work with keywords, Boolean operators, nesting of operators, and truncation to get better results.

Sample Research Topic: "Does recycling E-Waste lead to environmental problems in and of itself?

Background: As more and more computers, cell-phones, televisions and other electronic media are dismantled and recycled, a whole set of environmental concerns are created. Frequently these materials are sent to developing countries without any concern for their environment.

You may find this too broad a topic. The following thesis statement is more specific:

“Companies that produce recyclable electronic products must be responsible and pay for safe and reliable methods of disposal, as well as safe, environmental friendly recovery of component parts and rare-earth metals.”

Keywords for this might include:
  • e-waste
  • recycling
  • electronic devices
  • environmental pollution
  • third-world countries
  • toxic metals
  • recycling fees
Some of the possible search statements which could be used for this thesis are:

- environment AND recycling AND “electronic devices” AND “third-world countries”
- (“e-waste” OR “electronic devices”) AND environment AND “third-world” and corp*
- (“toxic metals” OR “rare-earth metals”) AND “recycling fees”