

GUIDE TO CONDUCTING RESEARCH FOR YOUR CONFERENCE PAPER

HOW TO APPROACH THE RESEARCH PROCESS

Complex topics have no single right answer and no single source of answers. You will need to assess all of the information you uncover while researching your conference paper topic. Sometimes people can become overwhelmed or frustrated in the middle of doing research. By allowing yourself time to develop an understanding of your topic, looking at it from different angles and thinking about the 'big picture' of your research topic, you will lessen your frustration.

- Plan your **research strategy**. Finding an overview article in an encyclopedia or a general book on your topic can often help generate additional ideas, leads, and terms that you can use to search for more information on your topic. Textbooks are also a good overview resource.
- Keep a **list of terms or search phrases** that work. Keep adding or deleting to your list as you come across related concepts, broader or narrower concepts, synonyms, etc.
- Critically **evaluate** your source of information (Remember: Authority, Currency, Content, Point of View and Level of Presentation).
- While doing your research, remember to write down the **citation** for the source(s) you use. The elements (or parts) of the citation are: the author's name(s), title of book or article, journal title, page(s), date, etc. Each element that makes up the citation is called a field: author's name occurs in the author field, title of article occurs in the title field, etc. Citations are very important because: (1) You will need to provide this information in your Reference List. (2) This is your evidence that you found other people (colleagues, experts, scholars, etc.) that agree with/support your research topic. And (3) if you ever need to find this source again, the citation is the way to identify it.
- When you are taking notes, try to remember to **make connections** between your sources. Ask yourself: "How does this idea fit in with what I have already read or know?" "Is it similar?" "Does it contradict or does it support what I have read so far?" "What is the point of view?" "Are there any biases?" "Does it make sense?" "What additional information do I still need to find out?"

YOUR RESEARCH STARTING POINTS

- ❑ **Engineering Research at the University of Pittsburgh**
<http://www.library.pitt.edu/services/classes/engineering/>
 Provides information about the different types of library resources (books, articles, patents, reports, etc) that are used for doing research and how to find the information within them.
- ❑ **Subject Guides to Article Indexing Databases**
<http://www.library.pitt.edu/articles/subjects.html>
 Provides access/entry into the electronic resources (databases, electronic journals, etc) that you will need to use for your conference paper research. Subject guides on this site that may cover your topic area: **Engineering** | **Chemistry** | **Medicine** | **Computer & Information Science** | **General Interest**

REMEMBER:

YOU CAN ALWAYS ASK A LIBRARIAN FOR ASSISTANCE WITH USING ANY OF THE ABOVE RESOURCES.

DATABASES

The majority of the resources you will use for your research will be library databases.

- A **database** is an organized collection of electronic/computer records that uses specific software for accessing the information contained within. When reference is made to databases within the context of library resources, often what is being referred to are online indexes or indexing databases.
- An **index** is a guide to the contents of a file, document, or a group of documents. Indexes are typically arranged by subject, author, or keyword. Most library databases provide indexing and abstracting for articles that have appeared in journals, magazines, or newspapers. An indexing database will provide you with enough information to locate an article in a journal or magazine. Some key indexing databases that index articles from engineering related journals would be *El Compendex*, *INSPEC*, and *SciFinder Scholar*.
- However, not all library databases are indexes. Some databases are **catalogs**, like PITTCat, which contains records that reflect what the library system at Pitt has in its collection and where those items (i.e. the books, journals, sound recordings, maps, etc.) are located. Once you identify an article in an index database, you may need to search a catalog database next in order to locate the journal that article is in. There are other types of library databases, such as **reference** databases. An online dictionary or an online encyclopedia would be an example of a reference database.
- The University of Pittsburgh's library system subscribes to several hundred databases that you can access for any of your research needs. Since the databases are web-based, an important thing to remember when searching them is that you are NOT searching the web; rather you are searching concentrated sources of scholarly information in specified subject areas that are web-based. So using these databases is preferable to using a public search engine to locate information, as that web searches include a high proportion of commercial and irrelevant results.

GUIDELINES ON HOW TO SEARCH JUST ABOUT ANY DATABASE**① LEARN ABOUT THE DATABASE**

Know what you are searching for or ask yourself "Why am I going to use this database?"

Databases usually provide online documentation as to the scope of the database including:

- **What TYPE OF DOCUMENT (Books, Articles, Conference Papers) are you looking for?**
Do you want to find books? Then you would need to search an online catalog database such as PITTCat to find out what book titles the Pitt libraries own. Looking to find articles? Then you need to search a database that indexes articles.
- **What SUBJECT is covered (or not covered) in the database?**
Just as you wouldn't search PITTCat (catalog) to find articles, don't expect to find scholarly engineering articles in a newspaper index. After you figure out what type of documents you want to find, you need to think about what subject area. Don't get discouraged if you pick a database that seems to be subject appropriate, but you don't seem to be getting the results you want. You may have chosen an area of research that

has not had many articles written about it. If this is the case, try to do a search on a related topic, use different search terms, or try a different database. Please don't hesitate to ask at the front desk of the library for help; librarians are here to assist you in determining which database to choose.

- **Is the information FULL-TEXT or is CITATION/ABSTRACT only?**

More and more electronic indexes are providing the full-text of the article within the database, but just as many only provide the citation. A **citation** typically includes the following information: **title of the article, author of article, the journal name, date, volume, issue, pages, etc.** This same citation information is also what you will use for your Reference List at the end of your paper. If the indexing database you are using only provides the citation of the article, then you will need to search **PITTCat** to find out:

- 1) If University of Pittsburgh Library System subscribes to the journal or magazine that contains your article and
- 2) Where the journal or magazine is located. Journals are shelved in the University Library System, including the Engineering Library, alphabetically by the title of the journal.

- **What YEAR/DATES are covered?**

Most databases only index article information as far back as the past five to ten years (i.e. early 1990's). You could spend hours searching for information about something that happened in the 1970's only to find out that the database you have chosen to search only goes back to 1989! However, there are some that do go back further; one example would be SciFinder Scholar, which indexes articles, papers, etc. back to 1907. **NOTE:** In order to find older materials, it is often necessary to use the print indexes instead of the indexing databases.

② USE ALL THE SEARCH FEATURES AVAILABLE TO YOU.

Even though different books cover different subjects, the arrangement of all books is pretty much the same (they have a table of contents, chapters, index, etc.) The same is true for most indexing databases. So even though the content or subject coverage may differ from one database to another, the way to access the content and/or use the database will often be very similar. The following search features are available, in some form, in every database:

- **USE OPERATORS TO COMBINE SEARCH TERMS**

Boolean Operators (AND, OR and NOT) are used to link concepts in database searching.

Use **AND** to narrow a search. Both words must be present in the records you retrieve.

Ex. moon **AND** orbit - Retrieves all records with moon and orbit.

Use **OR** to expand a search. Your search will retrieve records with either of the terms present.

Ex. (moon **OR** lunar) **AND** orbit - Retrieves all records with lunar orbit and all records with moon orbit.

Use **NOT** to exclude records containing the word that follows the NOT operator.

Ex. (lunar **AND** orbit) **NOT** moon - Retrieves all the records with lunar and orbit, but discards any records with moon.

Proximity Operators: are used in electronic searching to find words that occur near each other. For example, if you are looking for information about "fatigue fracture" as a concept, you could use proximity searching to specify that the word "fatigue" should occur within one word of the word "fracture". Sometimes quotes around the terms are used, sometimes a symbol is used: Ex. fatigue **w/** fracture.

- **USE TRUNCATION AND/OR LIMITERS**

Truncation:

Using a truncation symbol, usually an asterick (*) or question mark (?), helps you to find all of the variants of your keyword:

engineer* would find: engineer, engineers, engineering, engineered

comput? would find: computer, computers, computing, but also computational

Limiters:

Help you restrict the results/matches made during a computer search by adding other criteria to your search. You can usually limit your search by the date, language, and for some databases that index more than just articles, by type of document (such as conference paper, book, article, etc.). Field limiters can also help you limit search terms by which field the word occurs in.

Remember, citations are made up of fields: author field, title field, etc. Therefore, you could construct a search that would only find articles that have the words **fatigue fracture** in the title field.

- **PRINTING AND DOWNLOADING OPTIONS ARE ALWAYS AVAILABLE**

And, increasingly, emailing the results to yourself is an option

- **HELP OPTIONS ARE AVAILABLE**

Almost ALL databases have a 'built-in' help guide to assist you with that particular database. The library also has print help guides for certain databases. And, of course, librarians are available to help, too!

③ READ THE SCREEN.

Most database interfaces will have a place (or several places) on the screen where they will list what the available options and features are for the database you have selected. These are usually located on the left or right side or on the top or bottom of the screen. These options/features will often change based on where you are in your search. For example, once you get a list of results from your search, look for the printing/downloading/ or emailing options. Overall, it is important to focus on the general concepts of how to search, rather than the specifics of each individual database interface. So, if you remember that each database should have some of the search features listed above under section ②, you can easily learn how to search any new database.

OTHER RESOURCES TO ASSIST YOU WITH WRITING YOUR CONFERENCE PAPER

- ❑ **HOW TO FIND TECHNICAL WRITING GUIDES:**

Guides that assist you with writing are often referred to as style manuals, because different styles or types of writing require that you use specific guidelines. For your conference paper, you are required to use the formatting guidelines provided on the ENG 0012 Web Site. However, other technical writing handbooks (or style manuals) may provide you with additional writing assistance. To find technical report writing guides that the ULS libraries have, do a **keyword** search in **PITTCat** and use the following search terms: **technical writing** and **handbook**

- ❑ **WRITING CENTER AT THE UNIVERSITY OF PITTSBURGH:**

<http://www.english.pitt.edu/resources/writecent.html>

The Writing Center can assist you if you have questions about the writing process as well as use of language, grammar, spelling, etc. The Writing Center is located M-2 Thaw Hall.

- ❑ **WRITING GUIDE WEB SITES:**

Academic Writing: Research Papers (University of Wisconsin's Writing Center)

<http://www.wisc.edu/writing/Handbook/PlanResearchPaper.html>

Quoting and Paraphrasing (University of Wisconsin's Writing Center)

<http://www.wisc.edu/writing/Handbook/QuotingSources.html>

Writing Guidelines for Engineering and Science Students (Virginia Tech)

<http://fbox.vt.edu/eng/mech/writing/index.html>

Online Writing Resources (Southern Illinois University)

<http://www.siu.edu/~write/resources.html#anchor1370435>

Biomedical Writing Course (Guide)

<http://www.inter-biotec.com/biowc/biowc.html>

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