STS Chat:
5 Advanced Search Techniques
Students Should be Using More
1. OR
2. Truncation
3. Limits/Filters
4. Phrase searching
5. Citation searching
Format of slides:

• WHAT these are
• WHY they’re useful
• HOW - some anecdotes from my credit course and/or visiting classes
OR - WHAT

A Boolean operator that allows for the presence of at least one of the terms listed.
Consider you’re searching for 2 concepts. Each concept has 3 terms commonly used for it. If you tried different two-word combos, you’d be doing a lot of searches:

- A AND X
- A AND Y
- A AND Z
- B AND X
- B AND Y
- B AND Z
- C AND X
- C AND Y
- C AND Z

Topic 1: A, B, C
Topic 2: X, Y, Z

OR - WHY
The power of OR means fewer searches and not needing to keep track of searches to make sure you didn’t miss some combination. But a lot of people don’t do this. Instead of the many searches on previous screen, we now have one thanks to OR (plus the power of nesting/grouping):

(A OR B OR C) AND (X OR Y OR Z)
Some anecdotes:

- Not all students are familiar with using OR with searching. Interestingly, some students in majors that address Boolean logic don’t always think of using OR.
- Some students do not think of alternate terms for concepts at all. Introducing OR in your instruction can encourage students to think about the different terms that might be used for the same concept. In my class, I have them create a table of terms for each concept.
- Comparing the syntax of using OR to equations can help science students relate.
Truncation - WHAT

Finding words with a common root, also referred to as stemming. The * is the symbol most commonly used to implement truncation and is simply put at the end of a string of characters.
Truncation - WHY

Consider that many terms for a concept might have similar roots. Also consider plurals/singualars are not automatically searched in all tools. You’re also assuming even if they are that the tool handles this in ALL cases (e.g. irregular plurals). Truncation is a tool that allows for getting at these variations.

But of course it’s not always usable.
# Truncation

<table>
<thead>
<tr>
<th>engineer*</th>
<th>cat*</th>
</tr>
</thead>
<tbody>
<tr>
<td>engineer</td>
<td>cat</td>
</tr>
<tr>
<td>engineer s</td>
<td>cat s</td>
</tr>
<tr>
<td>engineer ing</td>
<td>cat aract</td>
</tr>
<tr>
<td>engineer ed</td>
<td>cat amaran</td>
</tr>
<tr>
<td></td>
<td>cat alog</td>
</tr>
<tr>
<td></td>
<td>cat astrophene</td>
</tr>
</tbody>
</table>
Truncation - HOW

Some anecdotes:

- It seems as if MOST students in my credit course haven’t heard of truncation.
- Some students really enjoy finding out about it as it saves them the trouble of dealing with word variations.
- Some students have trouble grasping it until seeing it in action – especially considering situations where it could get too many terms.
- Some students seem to think the search tool somehow works magic behind the scenes to do this automatically. Some databases do, some don’t – but how it’s applied can vary. Will searching for *engineer* also get *engineering*?
Limits/Filters - WHAT

• Enables users to be as specific as possible about their needs beyond the search terms.

• Options a database has to allow users to specify certain characteristics of items in search results. Common ones are language, format, and year. Some databases have very detailed limit/filter options, some have just a few.

• Most databases have at least a few. Years, format, and language common. Some databases, like PubMed, Scopus, and Web of Science, have MANY options.

• Most databases focus on these as “include only these” when chosen. Some database also allow you to exclude items with certain criteria.
The usefulness is to get at what you really want without needing to manually sort. If you want only English language items, 2010-present, and only journal articles – many databases allow you to do that.

These can also be useful to help give you some ideas for your search. For example, databases that have filters of keyword terms after a search may give search term ideas.

And probably the biggest reason: Make the searcher’s job easier. Get rid of the stuff you don’t want.
Limits/Filters - HOW

Some anecdotes:

• Some people don’t bother since they rarely go past first few pages. But then get frustrated when seeing items not meeting their needs (e.g., non-English, non-journal items, etc.).
• Some people are surprised at the power of some filters – PubMed allows very deep filtering. GeoRef allows for many formats and geologic time periods.
• Even after being introduced to their power, some people neglect to use them despite the fact that these will get them closer to what they want. For example, interest in non-human medical research in PubMed, it’s best to use the limit option to focus in on animals.
Phrase Searching - WHAT

Specify that 2+ terms typed appear in that exact order. Usually implemented by putting " " around the words.

"Ohio State" is different than Ohio State
Phrase Searching - WHY

Exactness – if you are looking for something that comprises two or more terms, tell the database that. Otherwise, it doesn’t know and assumes you don’t care about word order, just the words both being presence.

But it can get weird too. When you don’t specify phrase searching and you use Boolean operators in conjunction, the database can do weird things. Try searching multiple databases for

United States OR Canada

What does the database do then? Well, it varies but it’s rarely the user’s intent.
Phrase Searching - HOW

Some anecdotes:

• For some reason, of the ones I’m sharing today, this function seems to be the most difficult for students to actually put into practice. Despite a lot of examples and use in my course, some students get to their own searches and leave it out. They seem to assume the database knows what they mean.

• This can be especially problematic when it comes to searching for something that would find many irrelevant results without the quotes – Ohio State being a good example. I’ve actually seen student get burned by this in a citation database’s affiliation search. Ohio in one author’s affiliation, State in another author’s.
Citation Searching - WHAT

• I like to refer to this as a reverse bibliography. Finding one good article allows you to go both forward and backward in time and see what publications have built on an item’s research – in addition to what publications it built upon.

• Web of Science is the established tool, but Scopus and Google Scholar also do this (and a few other subject-specific databases have some of this data). Web of Science and Scopus also focus on author institutions, which can also be of interest.
Citation Searching - WHY

• One on-topic article can get you more research – both forward and backward in time.

• Heavily-cited articles can be a sign of quality or importance to the topic. Although there may be occasions of a lot of refuting!

• You can find prolific authors or institutions. Do you want to interview someone? These tools are great for finding that info.
Citation Searching - HOW

Some anecdotes:

• Some students are surprised at this level of detail from just finding one article. Although the prevalence of use of Google Scholar has decreased this being a surprise.

• Many students are told to examine bibliographies to get more items on topic. This makes things easier and gives them the “forward in time” too.

• Students find it really neat to find researchers are their institution. I have routinely visit a class where interviewing someone is an assignment and their inclination is to scour department sites in the hopes of finding someone writing about a topic of interest to them – which isn’t efficient, especially in the age of interdisciplinary research.

• Web of Science and Scopus are used in my class and many students single one of these out as their favorite search tool from the course (although maybe it’s because they’re the last tools introduced?).
Discussion