

Teaching power searching



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has based this

article on the seminar, *Power searching*, which she developed and delivered for ASLA (NSW) Inc. The article includes teaching resources and processes for searching from St. Ignatius College.

Searching for information is easier and at the same time more complex for students and staff than before the advent of the internet. Prior to *Google*, advanced searching involved the use of a taxonomy of terms or knowledge of library subject headings combined with boolean operators. Power searching uses the various search engine tools and a variety of known information sources, including the hidden web and search techniques.

Professional educators need to develop advanced search techniques, or power searching skills, and ensure that their students develop these skills for personal research needs based on curriculum requirements.

Future trends of search engines

Search engines are the beginning of the ubiquitous computing that Negroponte (1995) wrote about. Currently, *Google* can search any open website as well as database based websites such as *YouTube*. *Google* can also search your personal computer and with *iGoogle* (Figure 1) the beginnings of personalisation have started. *Google* is becoming the one stop shop



Figure 1 *iGoogle* <www.google.com/ig>

for any information need, no matter what format or whether it is internet or personal computer or WAN based.

A blurring of content and process occurs when the functions of a search engine are combined with content. Search engines are becoming more interactive and mashups are becoming common. Consider the development with *Google maps*; 18 months ago, it only showed aerial views of different areas. Now a student can search a specific address and can view the house at that address from any angle. The student can also move around the streets at street level or by flying. *Google maps* has also been mashed with tourist websites and other functions such as *San Francisco solar map* (2008) where *Google maps* has been used. This additional content and interactive function will continue to develop. Check out *Google trends* for more information.

Professional research

Educators need to use in-depth information at the point of need and adapt to, and to be flexible about, individualising student learning needs as well as preparing for changing curriculum

needs. Starting at the beginning for each topic or updating information on a topic can be time consuming.

In particular, researching for different discipline areas requires slight variations in search strategies and tools. This can be time consuming and can lead to unproductive results. Providing tools for teachers to research effectively and quickly supports student learning.

Teacher librarians supporting power searching

Teachers can be supported in their research through:

- identifying websites specific to their subject or discipline
 - e.g. pathfinders for specific topics
- identifying hidden websites of more relevance to their subject
 - e.g. <www.incywincy.com>
- identifying Web 2.0 tools that support specific research needs
- customising search engines for their subject
 - e.g. *Google custom search engine* <www.google.com/coop/cse>
- maintaining and developing knowledge about search engines.

How to maintain and develop knowledge about search engines

While *Google* is the dominant search engine, new search engines appear regularly.

- Check out *Hakia* and *Powerset*.
- Search engines are mashing with other tools. *iGoogle* (Figure 1) is an example of this.
- Search engines specifically for Web 2.0 tools, such as *Ma.gnolia* are also developing.
- Search engines do not yet find images – they find text associated with the image, however true image search is developing. Try an advanced image search in *Google* and select face – this will find images on the topic that have faces in them.
- Personalisation of search engines. Check out *Ms Dewey* at <www.msdewey.com>.
- Clustering search engines provide sub categories to support the students in refining their search. See *Quintura* <quintura.com>.

Teaching search strategies

Teaching search strategies to students is subject to ongoing change; I follow a process based on Year levels K–12 or research needs. In general, I use an initial three step process:

1. Use *Wikipedia* to understand the basics of the topic – question the accuracy or authority of the information.
2. Check resources for more in-depth information – books, online databases, etc.
3. Use the advanced search function in *Google* or in other preferred search engines.

Teaching search skills

When search skills are needed, depending on the students' age or topic for research, I then use the following points for explicitly teaching search skills:

- identification of keywords to use for search terms
- identification of synonyms for keywords – use of define function in *Google*, followed by lateral terms
- an understanding that search engines default to the *and* operator, so use basic boolean operators *and* and *or*
- an understanding that search engines, databases and library catalogues can use different terms
- search engines use natural language – therefore the student needs to know the best keywords to use
- databases use a thesaurus and keywords – therefore the student needs to know the best keywords and, once identified, the best thesaurus descriptors to match information needs
- library catalogues use keywords and a structured subject index – therefore the student needs to know the best keywords and how use subject headings
- construct search queries to refine results
- refining searches – use of domain, date, file type functions
- deconstructing assignment questions, including the scaffolding of glossary terms such as *compare* and *evaluate*
- students need some background general reading on a topic to have enough knowledge to develop a further search query
- use of Web 2.0 tools for research – *del.icio.us* tags etc
- show students how to use invisible web search engines.

At Riverview, separate programs have been developed to teach advanced searching for Year 11, and a research program in flexible modules for Year 12.

Advanced research for Year 11

This program requires two periods at the beginning of Year 11 in English,

changing according to the topic, gender justice, what is truth, etc. While the program was reduced to a four step process, there was a great deal of discussion about the brainstorm process and the constructing a search query step.

Step 1 What information is required?

Discussion about the concept of gender justice and related sub topics.

Step 2 If a question is provided, then deconstruct the question to determine:

- the action or instruction to be taken – usually a verb from the HSC Glossary list. These actions or instructions also had learning scaffolds attached as needed, e.g. compare, describe, analyse, evaluate.
- identify the limiting or qualifying words – the limiting words are those that provide parameters for the search, e.g. geographical regions or dates etc
- identify the key concept – After identifying the instruction and the qualifiers, the only terms left should be the key concepts. These need to be developed so that synonyms and lateral terms and sub topics of the key concept are noted.

Once these are determined, a search query would be constructed.

If there are no questions and it is an open research task, the process of instruction, qualifiers, and key concept should be used to develop research topics or questions. Students are reminded that a topic should be chosen based on 20% of what they know and 80% of what they would like to find out.

Step 3 Build a search query. Identify terms and qualifying terms.

Step 4 Identify search engines, catalogues, etc to use.

Year 12 research program

Following on from the Year 11 program, a self paced modular research program was developed for Year 12 (Figure 2).

Year 12 Research Program

Getting started with an assignment

Students will be able to:

Identify the instruction, limiting and key concepts in the question or task in order to deconstruct questions

Define the instruction term and use the process appropriate to the term e.g. explain, compare etc

Develop a plan for research or an assignment by using Inspiration and other tools

Develop and use an Assignment Checklist

Reference materials Part A

Students will be able to:

Define their topic using first level reference material – dictionaries and encyclopedias

Locate and undertake background reading that supports the students understanding of the task

Identify core resources or seminal works for specific topics/subjects

Indexes and databases

Students will be able to:

Access and interrogate *Ebsco*, *ELibrary* and *MacquarieNet* using advanced search techniques

Subscription services

Students will be able to:

Locate hard copy information that is available as a subscription

Use the subscription service effectively for their information need – *Infocus*, *Issues* series

Reference material Part B

Students will be able to:

Access primary sources for information

Access other reference materials for specific information types – almanacs, census data

Digital media

Students will be able to:

Access visual media for information – *ClickView*, podcasts

Online sources for HSC students

Students will be able to:

Access and use Board of Studies and other related sites for study purposes

Find and access practice exams, tests

Locate model answers

Using other libraries

Students will be able to:

Identify and access other libraries relevant to their information needs – universities, State Library of NSW, National Library, Local public libraries

Use the procedure for Inter Library Loans (ILL) available to Yr 12 only

The invisible web

Students will be able to:

Locate information on the www not searchable from the usual search engines

Start to develop subject specific web references

Organising information

Students will be able to:

Develop a notetaking format suitable for their needs

Organise information appropriate to the research

Copyright & plagiarism

Students will be able to:

Define the terms, copyright & plagiarism

Use information or data appropriate to the law

Revise *All My Own Work* content

Bibliographies & referencing

Students will be able to:

Write a bibliography according to Harvard guidelines for books, journals and websites

Reference quotes and material using Harvard guidelines

Presenting your assignment

Organise an essay for an appropriate information topic or audience – reports, narratives etc

Proof read for editing purposes

Using *PowerPoint* or other tools as appropriate for presentations for a specific purpose.

Figure 2 Year 12 Research program modules

Each module has a unit plan, teacher developed resources and student activities. From the unit plan, this could be taught one to one or via an online activity in the school's student learning management system. Each module is designed to be 30 minutes and to stand alone, for students to select on an as needed basis. The modules are also designed in a linear sequence so that the 13 modules provide an overview of the skills necessary for research. For example, the module on the invisible web has the following unit plan (Figure 3).

Power searching

Power searching involves knowing how to search effectively as well as using best websites and tools to find information. To be a power searcher, a search skill set, together with knowledge of search engines and Web 2.0, tools is needed.

Search skills

Effective searching requires knowledge of the functions of the search engine. For any assignment or research based work, students should use the *Advanced search* page (Figure 4) and use the functions of:

- **domain** – the organisational type of the website
- **date** – the date the page was last updated

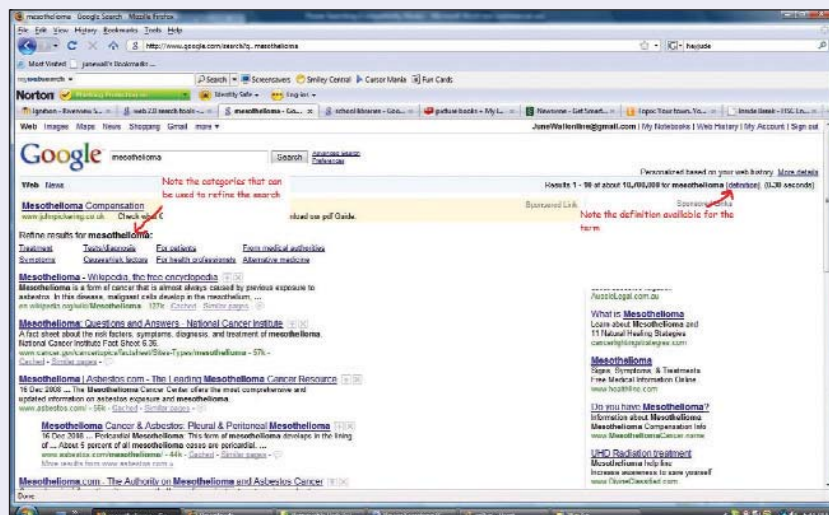


Figure 4 Use the Google advanced search functions

Teaching and Learning	<ol style="list-style-type: none"> 1. Input – the difference between the <i>surface</i> web and the <i>hidden</i> or <i>invisible</i> web. How search engines work and why they don't always help students find the articles on the hidden web 2. Structured activity – do a search on <i>Google</i> on a specific subject relevant to the student, use the same search query on <i>Infomine</i> and compare results. Discuss 3. Input – quality distinctions between the two 4. Unstructured activity – accessing the deep web 5. Structured activity – finding web info for specific subjects relevant to student.
Resources	<ol style="list-style-type: none"> 1. URLs to use for <i>deep</i> web access <aip.completeplanet.com> <www.lii.org> <infomine.ucr.edu> <www.incywincy.com> 2. Articles on the invisible web <ol style="list-style-type: none"> a. The invisible web b. Surface and invisible web comparison.

Figure 3 Unit plan for *The invisible web* module

- **filetype** – the information may be in files such as *PowerPoint*, PDFs, Word documents etc.

There are functions that can be used directly in the basic search screen of *Google*, the syntax of the search terms being {topic function:xxx}. For example,

information literacy site: edu or
defn: dictionary

A brief list of useful functions:

- **~** finds synonyms of the given term e.g. megacities ~problems
- ***** wildcard – means any combination of letters following e.g. megacit* will find megacities, megacity
- **filetype:** returns pages with the given filetype e.g. megacities filetype:ppt finds *PowerPoint* files on megacities
- **site:** returns pages in a given domain e.g. megacities site:edu finds pages only from an educational institution
- **movie:** returns movie titles that have the given topic e.g. movie:megacities
- **allintitle:** returns pages with the given terms in the title e.g. allintitle:megacities.

Yahoo uses search functions such as:

- to look for a page with a specific feature use *feature:index* or *feature:table* *feature:audio* *feature:video*

- to limit by region use *region:africa etc – asia, centralamerica, downunder, europe (incl UK), mediterranean, mideast, northamerica, southamerica, southeastasia*
- check out <yq.search.yahoo.com>.

Knowledge of search engines

While Google is the dominant search engine, there are search engines that are more suitable for specific purposes:

- *Ixquick* – <www.ixquick.com>
- experimental search – <www.google.com/experimental>
- news archive search – <news.google.com/archivesearch>
- <www.nationmaster.com>
- <www.searchme.com>
- <www.findsounds.com>.

Web 2.0 tools

There are countless Web 2.0 tools to use for research. While the tools are becoming easier to use and can provide complex results, there are many more tools than five years ago to use for research purposes. The implication for educators therefore is the need to be as informed as possible about the tools. The following is a snippet of some tools that could be of value to student and staff research needs.

Rollyo (Figure 5) allows you to easily customise and build a topic specific search engine that searches specific sites <rollyo.com/junewall/my_information_literacy>.

Blinkx searches for video and includes *YouTube* as well as other sources <www.blinkx.com>.

Gurulib is a simple library system for a home collection. The additional function of notes and ratings would be of use to senior students doing research as they could maintain an annotated bibliography as well as notes for each resource for their research topic <www.gurulib.com/junewall>.

Triplify is a search engine with a difference – it searches *Google*, *Yahoo* and *Live* simultaneously and then provides

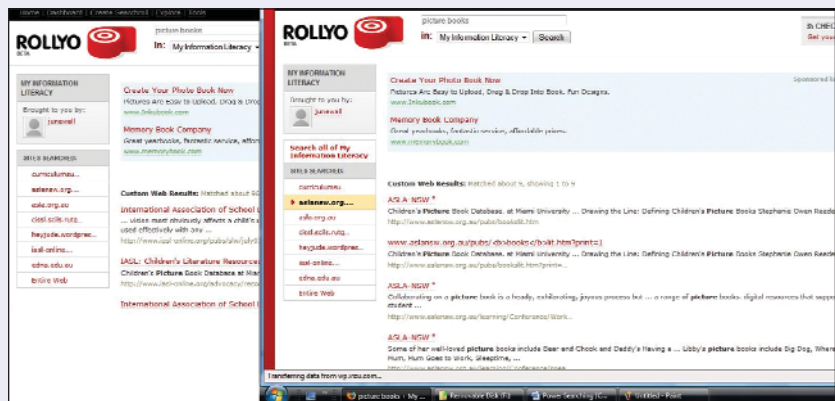


Figure 5 A customised topic specific search on Rollyo <rollyo.com/junewall/my_information_literacy>

results that the searcher can compare. This is a good tool to use when teaching high level searching as the student needs to think critically about which search engine is the most appropriate for his/her topic and search query <www.triplify.com>.

All things web 2 is a site that can keep you up to date with Web 2.0 developments <www.allthingsweb2.com>.

Are you search savvy?

Power searching is not just about creating the perfect search query. It involves:

- critical thinking to determine search terms
- breadth of understanding about the topic so that best websites can be identified
- knowledge of both Web 1.0 and Web 2.0 tools to determine the best tool to use or create

- a tenacious approach to research! Remember research does not need to be an individual activity; collaboration and knowing who the experts are or how to find them will bring much richer results.

Students and staff who are search savvy bring these qualities and good basic skills in research to each search topic. They automatically adjust their search technique based on a critical approach to the search process. They are more than information literate; they are truly lifelong learners. ■

[Editor's note: The Year 12 Research skills module: The invisible web is available at <www.curriculumsupport.education.nsw.gov.au/schoollibraries>.]

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