Scientific Information Literacy
From knowing the sources to searching methods

The mastering of scientific and technical information is an essential skill that young researchers must acquire as soon as they start working on their thesis. Because knowing
- The principles of scientific communication,
- Publishing modalities,
- Some bibliographic or full text information sources,
- The rules on how to present information,
Means being able to guide oneself among the huge amount of available data and results, but also to choose the relevant dissemination channels to be read and acknowledged ... and succeed in one's career!

Teaching objectives of the seminar

Knowledge: Getting to know the principles, the actors, the terminology, and the scientific information sources.

Know-how: Getting to carry out a documentary search based upon an EFFICIENT method.

Attitude: Developing a critical attitude when using information sources, making the pertinent choice of the relevant tools (avoiding the "searching under a lightning street lamp" attitude)

<table>
<thead>
<tr>
<th>Time</th>
<th>Program</th>
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<tbody>
<tr>
<td>9h – 9h15</td>
<td>Welcome address, presentation, practical aspects</td>
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<tr>
<td>9h15 – 10h45</td>
<td>I Scientific information: rules and trends</td>
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<td></td>
<td>• Scientific publication and evaluation of science</td>
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<td></td>
<td>• The scientific article: typical structure; reading of; writing of</td>
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<td></td>
<td>• The cost of publications: the unbelievable increase</td>
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<td></td>
<td>• The development of electronic journals (e-journals): a true revolution</td>
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<td></td>
<td>• New publishing models, Open Access, Infoscience</td>
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<td>10h45 – 11h</td>
<td>Break</td>
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<tr>
<td>11h – 12h30</td>
<td>II The researcher's information needs</td>
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<td>• What are the researchers' needs and how do the different types of</td>
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<td>documents meet them?</td>
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<td></td>
<td>• Why are there several types of documents?</td>
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<tr>
<td>12h30-14h</td>
<td>Lunch (free time)</td>
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<tr>
<td>14h-15h30</td>
<td>V Advanced search – practical exercises on WoS</td>
</tr>
<tr>
<td>15h30 – 15h45</td>
<td>Break</td>
</tr>
<tr>
<td>15h45 – 16h15</td>
<td>VI Obtaining the documents and managing your personal documentation</td>
</tr>
<tr>
<td></td>
<td>• How to obtain the documents: Inter-library loan</td>
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<tr>
<td></td>
<td>• How to manage your personal documentation</td>
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<td></td>
<td>• Dissertations and reports: writing and presentation rules</td>
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<tr>
<td></td>
<td>• Putting your thesis on-line</td>
</tr>
<tr>
<td>16h15</td>
<td>Evaluation of the seminar</td>
</tr>
<tr>
<td></td>
<td>Documents supplied: Hand-outs, additional texts, bibliography, list of</td>
</tr>
<tr>
<td></td>
<td>useful websites.</td>
</tr>
</tbody>
</table>
Practical aspects

Your training staff

- David Aymonin, Alain Borel, Anne Cherbuin, Anne Ecabert, Sylvie Vuilloud-Marcacci, Simon Pasquier, Sylvain Vuilleumier (IT Help)

Bibliothèque de l'EPFL

Questions

- Who has attended the « Scientific communication course » given by the CRAFT (N. Stainier and colleagues) ?

- Who speaks Français Deutsch English ?

- Any question ?

Introduce yourself

In 30 secs

- What are you working on ?

- What do you expect to learn today ?

I – Scholarly communication

Rules and trends
Scientific publication and evaluation of science (1)

- The scientific information process:

  - « Author »
  - Identified by
  - Family Name, First name
  - Affiliation (professional address)

Scientific publication and evaluation of science (2)

- XXth c. 90% of the researchers having ever lived since antiquity are alive today!!!!
  
  source: "La souris truquée, W. Broad"

- XXth c. 2,500,000 scientific articles per annum, 24,000 journals peer-reviewed.
  
  source: Self-archiving FAQ, (http://www.eprints.org), S. Harnad,

- Research evaluation is mainly based upon publishing articles in renowned journals, i.e. with:
  - Editorial board – comité de lecture
  - Peer reviewing by Referees – Révision par les pairs
  - Impact factor – Facteur d’impact

  To know more (fr, eng):

- In some disciplines, books or conference papers count for more:
  - Humanities, Computer sciences, ...

- The researcher’s fabulous destiny:
  
  Publish or Perish

  (it can drive you crazy !)
The Impact Factor

- Definition, by Thomson Reuters
  http://www.thomsonreuters.com/business_units/scientific/free/essays/impactfactor/

The impact factor is a measure of the frequency with which the "average article" in a journal has been cited in a particular year or period.

Thus, the impact factor of a journal is calculated by dividing the number of current year citations to the items published in that journal during the previous two years.

Calculation for journal impact factor.
Example for Science (year 1995)
- Number of articles published in Science in 1993 : 1 030 + in 1994 : 1 054 = 2 084
- Impact Factor 1995 = 45 663/2 084 = 21.911 ~ 22

The average article of Science published in 1993 or 1994 has been cited 22 times in 1995.

- What does mean "literature"?

The journals analysed by Thomson scientific in the database Web of Science (ex-Science, Humanities, Social sciences Citation index)

- Where can I find the Impact factor of my favourite journals?

In Journal Citation Reports, a commercial service from Thomson Reuters.

- Are there alternatives to the Impact factor?

Yes : H Index, SJR, Citeseer's Acknowledgement Index, Eigenfactor, …

H Index: http://en.wikipedia.org/wiki/Hirsch_number
Citeseer: http://en.wikipedia.org/wiki/CiteSeer
Harzing Publish or Perish software: http://www.harzing.com/pop.htm
Eigenfactor: http://www.eigenfactor.org
The scientific paper: typical structure; reading of; writing (1)

• Suggested reading mode for articles
  1. **Identify** : Title, authors + author’s affiliations (laboratory or company)
  2. **Read the summary** and decide whether the article is interesting or not
  3. **Read the conclusion, the figures and tables**, and decide whether the findings are interesting or not
  4. **Read the article in full**, marking the important parts (methods, results, interesting quoted references) with a fluorescent pen
  5. **Look for the referenced articles** that you have marked.

• Classical structure of research articles : IMRED
  
  Title  
  Authors  
  Affiliation  
  Keywords, Authors keywords  
  Summary  
  Introduction  
  Material & Methods  
  Results  
  Discussion / Conclusion  
  References

• Basic principle
  Any other researcher must be able to reproduce any experiment described and get the same results (sic)

An illuminating example

*Experimental demonstration of the tomatotopic organization in the Soprano (Cantatrix sopranica L.),* by Georges Perec  
http://pauillac.inria.fr/~xleroy/stuff/tomato/tomato.html

Georges Perec makes fun of the - sometimes absurd – formalistic way in which scientific articles are presented, as well as of the random quality of the “english” language used by scientists.

The scientific paper: typical structure; reading of; writing (2)

• Different types of articles
  
  Editorial - *Editorial*
  Lettre à l’éditeur - *Letter to the editor*
  Recherche - *Paper, research paper*
  *Revue de littérature – Review*  
  *Biography, Controversial, etc…*

• Scientific writing : instructions to the authors
  
  • Each journal has its own rules for presenting articles.
  • These rules are called “guide for authors”, “instructions to authors”
  • They are usually published once a year.
  • They can be found on the journal’s website.

• Scientific writing : stylistic rules
  
  • Scientific jargon and “reality” : scientific writing is coded

  See [A KEY TO SCIENTIFIC RESEARCH LITERATURE](http://www.math.utah.edu/~wisnia/scientific.html)

  • You can learn how to acquire a “scientific” style

  To know more : Attend to the Nadine Stainier’s course & Please read the bibliography at the end of this document
**Economy of the journals : the unbelievable increase**

- The first scientific journals go back to the XVIIth century, with the creation of Learning societies and Academies.
- In the last 20 years, scientific publishing has almost become a monopoly in the hands of the publishers.
- The cost of subscriptions to journals has increased by 321% between 1986 and 2006.
- Economic model: publishers ask for the maximum price their clients can afford to pay.

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**Electronic journals on the web : a true revolution**

- Most of the most important journals now exist in electronic format, on the web, but with paying access.
- But the web allows new ways of free dissemination of science, following the principles of Open access.

Know your rights: Authors rights brochure from SPARC/ARL
http://www.createchange.org/

- In 2007, the FNS has taken a directive on open access? And a regulation in 2008. Did you know? What is the point? Are you involved?
  - FNS Directive on Open Access

Some milestones in Open Access movement:
- Budapest Open Access Initiative (dec. 2001)
  http://www.soros.org/openaccess/fr/index.shtml
- Berlin Declaration on open access (oct 2003)
  http://www.zim.mpg.de/openaccess-berlin/berlindeclaration.html
- Stevan Harnad : « The scientific Skywriting » (2003), and The Self-Archiving FAQ, http://eprints.org

- Copyright is a VERY important issue!
  Copyright FAQ on Infoscience: advices & personal assistance
  http://wiki.epfl.ch/infoscience/copyright-faq-en

- The EPFL librarians help you to follow the rules and to put your papers online with
  http://infoscience.epfl.ch

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Monograph and serial expenditures
In ARL member libraries, 1986-2006
http://www.arl.org/bm-doc/monser

Serials Pricing Crisis

![Monograph and serial expenditures graph](chart.png)
II – The researcher’s information needs

a) your own representations and use
b) what the theory says
c) Where is Google?

In Theory: 3 types of information needs

**Daily, continuous, retrospective**

The daily quest for information (mainly reference)

<table>
<thead>
<tr>
<th>Everyday I look for ...</th>
<th>Type of information source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facts or data</td>
<td>Specialised dictionaries, language dictionaries, tables, chronologies, constants tables, ...</td>
</tr>
<tr>
<td>Methods or techniques</td>
<td>Specialised books, technical series, ...</td>
</tr>
<tr>
<td>Theoretical or basic information</td>
<td>Good level course books</td>
</tr>
</tbody>
</table>

Current research (current awareness and readings, mainly articles)

<table>
<thead>
<tr>
<th>I want to follow the latest developments in</th>
<th>Type of information source</th>
</tr>
</thead>
<tbody>
<tr>
<td>General scientific information</td>
<td>1 or 2 journals of general interest</td>
</tr>
<tr>
<td>My area of interest</td>
<td>3 to 5 specialised journals</td>
</tr>
<tr>
<td>My subject of interest</td>
<td>1 article database quickly updated</td>
</tr>
<tr>
<td>To know what the others do and make myself known</td>
<td>The “invisible college” discussion lists (forums), meetings, request-a-print</td>
</tr>
</tbody>
</table>

Exhaustive search (retrospective and broader coverage, all kinds of documents)

<table>
<thead>
<tr>
<th>Sometimes I must make sure that I haven’t missed any important publication</th>
<th>Type of information source</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be able to evaluate the state-of-the-art on a subject which is new to me</td>
<td>Union catalogues of Libraries, for books</td>
</tr>
<tr>
<td>To evaluate my current knowledge of a subject</td>
<td>Specialised Bibliographic databases</td>
</tr>
<tr>
<td>Just before defending my thesis</td>
<td>Exhaustive, retrospective, covering all types of documents</td>
</tr>
<tr>
<td>For the bibliography in my next paper</td>
<td></td>
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</table>

Information Literacy Seminar – Doctoral School - EPFL 2010
Consider Google and other Web search engines as less specific tools

- Today, Google, Google Scholar, Scirus, Thomson Scientific Webplus provide access to a vast PART of these information sources... But delivered as a bulk of links
  
  - Google Scholar: [http://scholar.google.com](http://scholar.google.com)
  - Scirus: [http://www.scirus.com](http://www.scirus.com)
  - Webplus: [http://scientific.thomsonwebplus.com/BasicSearch.aspx](http://scientific.thomsonwebplus.com/BasicSearch.aspx)

- Every search engine gives different results for a same query

- The "deep web", i.e. specific databases, is usually badly indexed

- Some websites are very good starting points, like Scientific portals for education and research.
  
  Example: **Intute**: science, engineering & technology
  
  [http://www.intute.ac.uk/sciences/](http://www.intute.ac.uk/sciences/)

  Intute: Science, Engineering and Technology is a free online service providing you with access to the very best Web resources for education and research, evaluated and selected by a network of subject specialists.

II Researcher's information needs

Why are there so many different types of scientific documents?

Each type has a specific objective

- **Primary information sources**

| Articles publiés dans les revues professionnelles et scientifiques - articles, papers, in serials | Current events, research results, reproducible results |
| Dictionnaires, encyclopédies techniques, ouvrages de base, manuels, ouvrages spécialisés - Dictionaries, Encyclopedias, handbooks, manuals, books | Essential data and state-of-the-art |
| Thèses, rapports et comptes-rendus de congrès - dissertations, reports, proceedings | Detailed research or most recent developments |

- **Secondary information sources**

| Catalogues de bibliothèques - library catalogs | Monograph references (books, theses and reports) |
| Bases de données bibliographiques généralistes et spécialisées - bibliographic databases | Article references (mainly) |
| **Plate formes web d’éditeurs – Publisher’s portals** : IEEEXPlore, Science Direct, ACM portal, Springerlink, ... | Fulltext + reference of papers from this Publisher |
| Outils de recherche sur Internet : annuaires et moteurs – Internet directories & search engines | A bit of everything |

Why are there so many different types of scientific documents?

Each type has a specific objective
III – Information retrieval

What are the suitable information sources for me?

• In the lab, ask for advice “old men”, bosses, “wise men”
• Ask information specialists
• Read and learn about information searching
• Train yourself and discover by yourself new sources

What to do first: Intelligent formulation of the question

• What do I want to know on my subject?
• What types of information do I need?
• What don’t I want?

What to do then: Mastering specialised search tools

• Discover the “neighborhood” first → Bibliothèque EPFL website
• Learn how to use the chosen tools → Discovery card
• Formulate a specific search equation → Strategy card
IV – Practical exercises

a) Knowing the information sources available at EPFL

b) Current awareness with simple searches on Web of Science

Who is interested in Chemistry?

Please fill the form in
### First level EXERCISES

#### Knowing the information sources available

EPFL library offers one of the richest scientific documentation in Switzerland, in paper or electronic format.

Bibliothèque de l'EPFL's website [http://library.epfl.ch](http://library.epfl.ch)

is the "door" to information and knowledge.

Will you know how to navigate in our virtual library?

<table>
<thead>
<tr>
<th>Starting from <a href="http://library.epfl.ch">library.epfl.ch</a>, and in less than 10 minutes, please:</th>
<th>Answers / Personal notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong> find the <strong>union catalogue</strong> of books, what is it called? How many libraries are part of it?</td>
<td></td>
</tr>
<tr>
<td><strong>2.</strong> find the <strong>location number</strong> of the book <strong>Swissmetro</strong>, written by Prof J. Neirynck, available at EPFL</td>
<td></td>
</tr>
<tr>
<td><strong>3.</strong> find the <strong>PhD Theses catalogue</strong>. How many electronic theses does it contain?</td>
<td></td>
</tr>
<tr>
<td><strong>4.</strong> find the <strong>EPFL scientific journals catalogue</strong>. Did you know it before?</td>
<td></td>
</tr>
<tr>
<td><strong>5.</strong> since when do we have the serial <strong>Physical Review</strong> in <strong>paper</strong> edition?</td>
<td></td>
</tr>
<tr>
<td><strong>6.</strong> since when do we have <strong>Physical Review</strong> in <strong>electronic</strong> version?</td>
<td></td>
</tr>
<tr>
<td><strong>7.</strong> find the <strong>EPFL Databases list</strong>, what does Web of Science contain?</td>
<td></td>
</tr>
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</table>
Second level EXERCISES

Web of Science (WOS)

Latest news in major scientific journals, in all disciplines. Makes you able to perform searches by citation (quotation).

Subscription price: 58'000 CHF/year

1. Demo

Content of WOS

Basic search

Truncations and Boolean operators --> Please use the HELP

2. It is your turn

Please proceed to these 3 series of exercises

Don't miss the use of the "Discovery card"

A. Discovery of WOS
   Basic search by TOPIC

<table>
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<tr>
<th></th>
<th>Answers / Personal notes</th>
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<tbody>
<tr>
<td>1. When using, the field <strong>TOPIC</strong>, in which <strong>fields</strong> is the search carried out by default?</td>
<td></td>
</tr>
<tr>
<td>2. When looking at your search results, try to get access to the <strong>Fulltext</strong> of a selected reference</td>
<td></td>
</tr>
<tr>
<td>3. Please check this <strong>equation</strong> (without typing it): Is it logically correct if I am looking for papers made at <strong>EPFL on Characterization of Biochips</strong>?</td>
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</table>

biochip$ OR (characteri?at* or analy?i*) AND AD=((polytech* same federal* same lausanne) or EPFL or (eth same lausanne))
### IV b) Current awareness. Simple search - WOS

#### Second level EXERCISES (continued)

**Web of Science (WOS)**

<table>
<thead>
<tr>
<th>B. Search by author's name and saving functions</th>
<th>Answers / Personal notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Find how many references of your PhD supervisor are in WOS</td>
<td><strong>Watch out!</strong> How to type author's name ???</td>
</tr>
<tr>
<td>2. Save your results on your hard disk or e-mail it to yourself</td>
<td>You must register first!</td>
</tr>
<tr>
<td>3. Go to the search history and ask for an e-mail alert</td>
<td>You must register first!</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C. Cited reference search and citation alert</th>
<th>Answers / personal notes</th>
</tr>
</thead>
</table>
| 1. Search the articles citing  
- one specific paper of your supervisor  
- or any other article, very important for you | **Watch out!** How to type author's name ??? |
| 2. Create Citation Alert for a specific paper | |
IV b) Current awareness. Simple search - WOS

Second level EXERCISES
SCOPUS, the Elsevier’s competitor to WoS

http://www.scopus.com

Same scope as WOS. More European and Asian journals covered.

<table>
<thead>
<tr>
<th>Discovery of the Database</th>
<th>Answers / personal notes</th>
</tr>
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<tbody>
<tr>
<td>1. Using the <strong>online help</strong>, compare its content to WoS (time span, list of journals)</td>
<td></td>
</tr>
<tr>
<td>2. Use the <strong>Discovery card</strong> to handle the main functions - search - visualisation - sorting</td>
<td></td>
</tr>
<tr>
<td>3. Discover the citation search functions</td>
<td></td>
</tr>
<tr>
<td>3. Create an e-mail alert</td>
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</table>

**Personal notes**

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V – Advanced search – practical exercises

**Exhaustive searches with specialised databases**

**Managing your personal documentation**
How to formulate a SMART question?

Please take 10 minutes to use the Strategy card, in order to formulate an equation.

How to choose the right database, suited to your topic and needs?

1. Get connected to the DATABASES directory here: http://library.epfl.ch/db/
2. Use the subject classification (classement par thème) in order to find the most useful databases
3. Choose THE most useful database
4. Discover its specific tools (fields, operators, wildcards, thesaurus, ...). You may find the Discovery card helpful at this stage.

How to perform an advanced search?

1. Adapt your equation on your Strategy card to the chosen database
2. Call a member of the training staff and validate your search together.
3. Before the break: save the strategy

Debriefing

- Are there references that you already knew before?
- Any references that you are discovering for the first time?
- How to get access to the full text of the papers selected?
- What are the most difficult steps in this method?
How to manage your personal collection of documents

- **How to manage your PDF files or Paper copies**

  1° Use a ready-made software application: Endnote, Procite, Reference Manager, Zotero, JabRef...

  2° Give each article a **SEQUENTIAL number** (in the pdf file name or on the paper).

  3° Note the **keywords** of the article in each record of the database

  5° File your articles **by number**, in order of arrival.

- **Demo of Endnote: Import and Export functionalities**

  1° Search in WOS

  2° Saving of some references, Endnote starts automatically

  3° Exporting references into Word

- **Endnote (full version) is available at EPFL via** [http://distrilog.epfl.ch](http://distrilog.epfl.ch)

  *To know more:*


  - Among many, good alternatives to Endnote are: Jabref, Zotero, BibTeX (LaTeX)
Who is interested in our “Endnote / BibTeX Workshop”?

Please fill the form in

VI – Obtaining the documents
Putting your thesis online

How to obtain documents: inter-library loan (PEB) and online ordering

To order articles, books or any other document not available at EPFL:

- Use ILL = Inter-Library Loan / Prêt entre bibliothèques (PEB)
- Practically, to locate a journal in order to find a specific article, search in:
  1. EPFL Periodicals catalogue on library.epfl.ch
  2. Google Scholar or Scirus
  3. "Request a document" form on http://library.epfl.ch/

Writing and presentation rules for dissertations and reports

- The presentation rules are defined.
- To respect them is to be respected by one's peers.

<table>
<thead>
<tr>
<th>Thèses (in French)</th>
<th>Guide OFFICIEL français de présentation des thèses</th>
</tr>
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<tbody>
<tr>
<td></td>
<td><a href="http://www.sup.adc.education.fr/bib/Acti/These/guidoct.rtf">http://www.sup.adc.education.fr/bib/Acti/These/guidoct.rtf</a></td>
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<tr>
<th>La Guilde des Doctorants</th>
<th>Guide du Doctorant</th>
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<tr>
<td><a href="http://guilde.jeunes-chercheurs.org/">http://guilde.jeunes-chercheurs.org/</a></td>
<td>et notamment le CELEBRISIME : Guide du Doctorant</td>
</tr>
</tbody>
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Dissertations (in English)

Writing and Presenting Your Thesis or Dissertation (English, Spanish, Portuguese, Arabic)
http://www.learnerassociates.net/dissthes/

Dissertationen (auf Deutsch)

Die Dissertation, Universität und Landesbibliothek Münster
http://lotse.uni-muenster.de/paedagogik/

PhD Humor
http://www.phdcomics.com/

See also the bibliography

Putting your thesis online

Remember... It’s possible NOW... and **COMPULSORY**

See: http://library.epfl.ch/theses/
Annexes

Bibliography (books in French)

Ouvrages de base :

Études, réflexion :

Rédaction, présentation :

Bibliography (books in English)

Starter guides and books :
• Communicating science : the scientific article from the 17th century to the present / by Alan G. Gross, Joseph E. Harmon, Michael Reidy. – Oxford : Oxford University Press; 2002. – ISBN 0195134540

Writing, presentation :

See also in NEBIS, keywords :
SCIENTIFIC WRITING (WORKING TECHNIQUE) 8 001.810, INFORMATION AND LITERATURE RESEARCH 9 eng |8 001.812

Annexes

Voir aussi dans NEBIS, sous les mots clé :
RÉDACTION SCIENTIFIQUE (TECHNIQUE DE TRAVAIL) : fee : 001.810, RECHERCHES BIBLIOGRAPHIQUES, RECHERCHES D'INFORMATIONS : fee : 001.812
Useful websites for self training and learning


Intute : Sections Science, Engineering and Technology and health and life sciences. Intute is a free online service providing you with access to the very best Web resources for education and research, evaluated and selected by a network of subject specialists. Heriot Watt University. - [Visitée 22/04/2010]. - http://www.intute.ac.uk/sciences/, http://www.intute.ac.uk/healthandlifesciences/, http://www.intute.ac.uk/socialsciences/


SPRINT : Schweizer Portal für die Recherche im Internet

LOTSE: Library Online Tour & Self-Paced Education ...LOTSE navigiert Sie einfach und sicher zu den elektronischen Ressourcen, die Sie für Ihr Fachgebiet benötigen. Es wurde speziell für Studierende und Wissenschaftler/-innen entwickelt. ...LOTSE sagt Ihnen für jeden Arbeitsschritt, welche Art Ressourcen Sie benötigen und führt Sie dorthin" [Besucht 22/04/2010]. - http://lotse.uni-muenster.de/paedagogik/index-de.php

List of documents distributed

1. Tomatotopic organisation... article by G. Perea
2. A key to scientific literature
3. FNS Directive on Open Access
4. Sparc/ARL Authors brochure
5. Infoscience brochure
6. Database : Discovery Card
7. WOS help : Truncations and boolean operators
8. American/British English Dictionary
9. Database : Search strategy Card
**A KEY TO SCIENTIFIC RESEARCH LITERATURE**

http://www.math.utah.edu/~wisnia/scientific.html

<table>
<thead>
<tr>
<th>What he said</th>
<th>What he meant</th>
</tr>
</thead>
<tbody>
<tr>
<td>It has been long known that...</td>
<td>I haven't bothered to look the original reference, but...</td>
</tr>
<tr>
<td>Of great theoretical and practical importance...</td>
<td>Interesting to me...</td>
</tr>
<tr>
<td>While it has not been possible to provide definite answer to these questions...</td>
<td>The experiment didn't work out, but I figured I could at least get a publication out of the project...</td>
</tr>
<tr>
<td>The operant conditioning technique was chosen to study the problem...</td>
<td>The fellow in the next lab already had the equipment set up...</td>
</tr>
<tr>
<td>Three of the S's were chosen for detailed study...</td>
<td>The results of the others didn't make sense...</td>
</tr>
<tr>
<td>Typical results have shown...</td>
<td>The best results have shown...</td>
</tr>
<tr>
<td>Agreement with the predicted curve is:</td>
<td>Agreement with the predicted curve is:</td>
</tr>
<tr>
<td>• Excellent</td>
<td>• Fair</td>
</tr>
<tr>
<td>• Good</td>
<td>• Poor</td>
</tr>
<tr>
<td>• Satisfactory</td>
<td>• Doubtful</td>
</tr>
<tr>
<td>• Fair</td>
<td>• Imaginary</td>
</tr>
<tr>
<td>It is suggested... It is believed that...It may be that</td>
<td>I think...</td>
</tr>
<tr>
<td>It is generally believed...</td>
<td>A couple of other guys think so, too.</td>
</tr>
<tr>
<td>It is clear that much additional work will be required before a complete understanding...</td>
<td>I don't understand it.</td>
</tr>
<tr>
<td>Unfortunately, a quantitative theory to account for these results has not been formulated...</td>
<td>I can't think of one and neither has anyone else.</td>
</tr>
<tr>
<td>Correct within an order of magnitude.</td>
<td>Wrong.</td>
</tr>
<tr>
<td>Thanks are due to Joe Glotz for assistance with the experiment and to John Doe for valuable discussion.</td>
<td>Glotz did the work and Doe explained what it meant.</td>
</tr>
</tbody>
</table>

**Discovery card** for a bibliographic database / a search engine

a) **Launch the search with using a simple word**

Example: choose a single word specific to your subject, ...

b) **Understand the number of answers you have obtained**

The number of answers means: the number of records containing the searched term in one or several fields (title, summary, most often keywords)

c) **Visualise the answers**

There are often several display formats.
The most frequent ones are: list of titles and full format.
Learn how to go from one to the other and how to move within the answers.
Most of the time, the answers appear in antichronological order (the most recent ones first).

d) **Understand the basic structure.**

It is necessary to analyze the content of an answer in order to know the FIELDS in each record.
The most frequent ones are:

<table>
<thead>
<tr>
<th>Field</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author</td>
<td>Title</td>
</tr>
<tr>
<td>Source</td>
<td>Address</td>
</tr>
<tr>
<td>Summary</td>
<td>Keywords or Authors keywords</td>
</tr>
</tbody>
</table>

The visualisation of an answer in full format will show you the existing fields. Also check the questionable INDEXES

e) **Write an equation using wildcards, operators and brackets to specify the logic of the question.**

Ex: I am interested in air and water pollution
Pollution AND (AIR or Atmospher* or water or sea* or river*)
Shipbuilding AND (shipyard* OR worker* OR accident*)

f) **Test this equation in the database**

If too many answers:
- delete all records of documents in Chinese or Russian
- limit the search to BOOKS or JOURNALS

If not enough:
- look at the answers to see whether other words might be used:
- the keywords which appear may be of help
  ex : In the PASCAL database, the French keyword for "grossesse" is GESTATION.

g) **Save** (not in the search engines)

The answers – it’s handy!
You must save or print AT LEAST:
- the title
- the authors
- the 'source' field which contains the exact references of the document and will allow you to obtain it in a library

The questions raised – it’s ESSENTIAL
To remember how you obtained the answers. It is thus possible to reload the archived question a fortnight, a month or a year later, without having to go through all the sequences again.
An answer without question is worth nothing.
Strategy card for a bibliographic database / a search engine

a) Write your question on a sheet of paper, in your mother tongue.
Imagine that you are going to meet tomorrow the leading world expert on your subject of interest and put your question before him.
I’d like to know...

b) Identify the important concepts and classify them from the most specific to the most general.

c) For each concept, find synonyms and variants,
Think in the plural, in the singular, in English, in your mother tongue. Make a list.

d) Write a SEARCH EQUATION according to the syntax of the search tool used
Using wildcards, operators and brackets to specify the logic of the question.
**Stratégie** d’interrogation d’une base de données bibliographique
ou d’un moteur de recherche sur Internet

a) Écrivez votre question sur une feuille de papier, dans votre langue maternelle.
Imaginez que vous allez rencontrer demain l’expert mondial sur votre sujet et lui poser votre question.

Je voudrais savoir...

b) Identifiez les concepts importants et ordonnez-les du plus spécifique au plus général

c) Pour chaque concept trouvez les synonymes et formes variantes,
pensez au pluriel, au singulier, en anglais, dans votre langue. Faites une liste.

d) Ecrivez une équation de recherche en fonction de la syntaxe de l’outil de recherche utilisé
en utilisant les troncatures, les opérateurs et des parenthèses pour bien préciser la logique de la question.