

Information Retrieval



Aalto-yliopisto
Aalto-universitetet
Aalto University

Eila Rämö

29.1.2024, 13.15-16

Course content

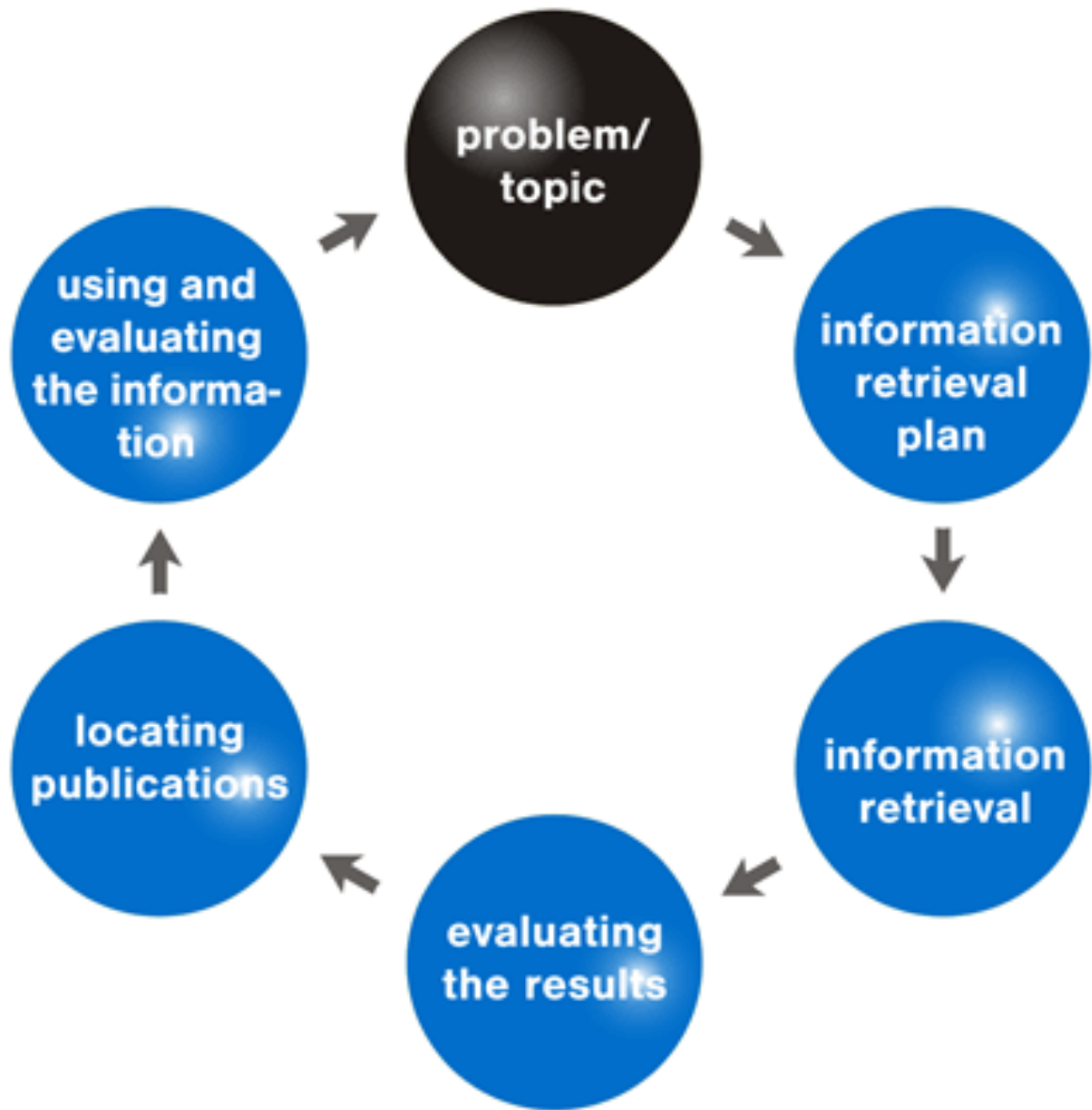
The information retrieval process

- Conceptualising the research topic
- Retrieval techniques

Information sources

- Learning Centre's information sources (e.g. Aalto-Primo, Research Guides, databases)
- Other information sources





Conceptualising the research topic

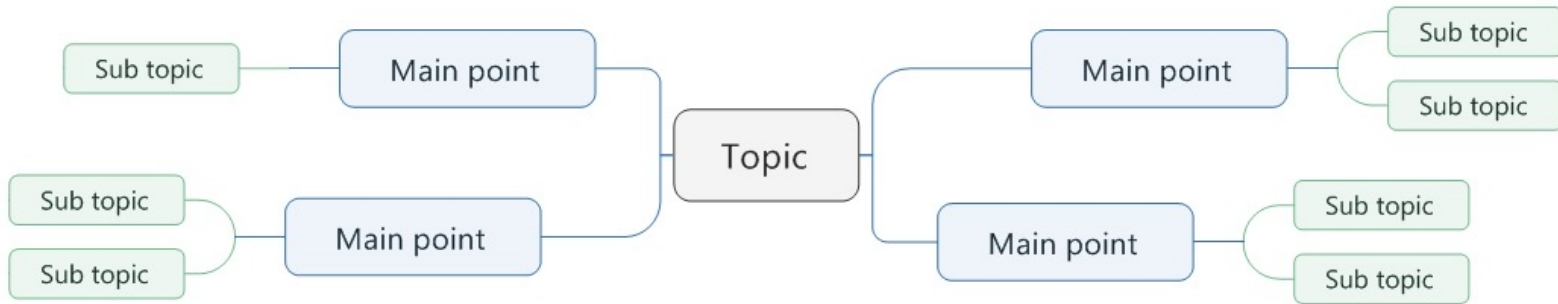
- **Free text:** any word in natural language, and their synonyms, other language equivalents etc.
fashion design, sustainability
- Use dictionaries and general thesauri on the web for ideas and definitions of terms (Thesaurus.com, Oxford English Dictionary, Mot dictionaries).
- **Controlled terms:** a term originating from a controlled vocabulary or thesaurus, e.g. General Finnish Ontology <http://finto.fi/yso/en/>
design management

Conceptualising the research topic

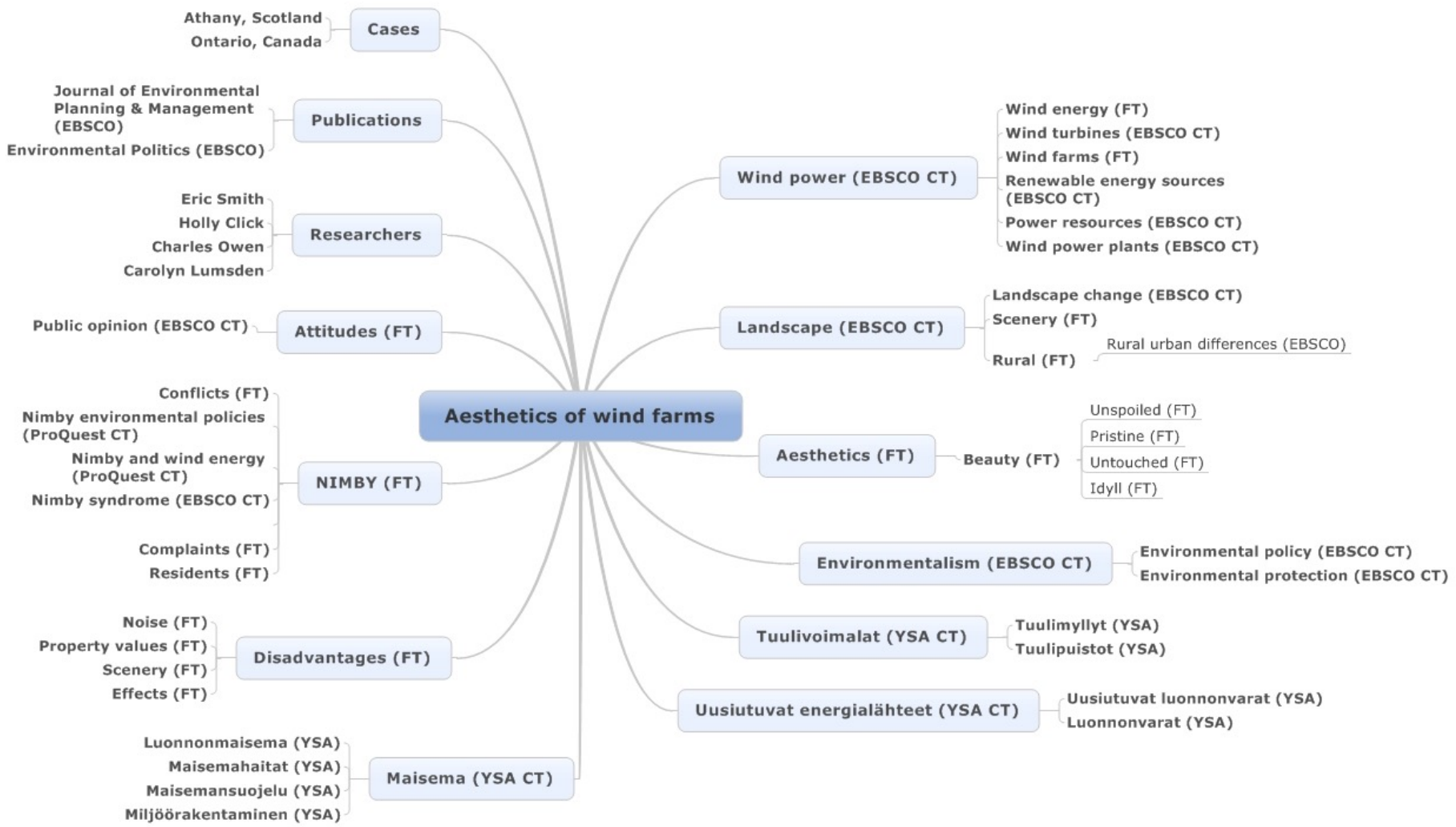
- **This is the most important phase in the search process.**
- Concepts are defined into search terms to be used in the search.
- Useful concepts are terms which are specific to the discipline and research subject.

- Use **mindmap** or a **concept map**
(FreeMind, CmapTools etc)
- MindJet on Aalto-university computers

Keywords in a concept map



Aesthetics of wind farms



Search techniques

- **Limit to particular field**
 - e.g. author, title, keyword, ISBN number etc.
 - narrows search results

- **Phrase search**
 - “fashion design”*

Search techniques

- **Free text search**
- any word in natural language, and their synonyms, other language equivalents etc.
- **Use truncation (*, ?, #) of terms and wild cards:**
 - sustainab* (sustainable, sustainability etc.)
 - wom?n (woman, women), colo?r (color, colour)

Search techniques

Subject term or Keyword searching

- A subject term search gives more accurate results than a free-text search and limits the search to the subject term field.
- When you find an interesting book or article, check the subject terms, and use those for further searching.
- YSO (General Finnish ontology) is used in Finnish university library databases, when books are described into a database.

finto.fi/yso/fi

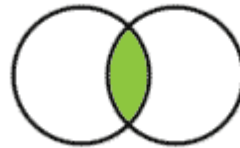
- Commercial databases use they own vocabularies (thesauruses/descriptors/subjec terms)

Combining concepts, Boolean searching

AND

"textile design"

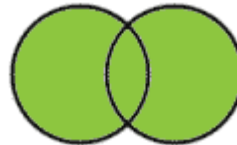
AND sustainab*



OR

"fashion design"

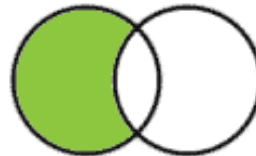
OR cloth*



NOT

"textile design"

NOT industrial*



Boolean logic in planning a search

- A search plan typically contains combinations of search terms (in different languages) and their synonyms.
- “fashion design” AND sustainab*
- Search terms are used in databases in combination with their search functions.
- Search functions: term truncation, boolean operators, phrases, thesaurus terms.

Information management

Reference management software:

- Zotero
- Mendeley
- EndNote
- etc.

Many different output styles for citing:

- Harvard (American and British)
- APA (American Psychological Association)
- Chicago
- etc.

Information management

The reference manager allows you to

- organize and create a personal database online
- format bibliographies according to different output styles
- import references from a variety of databases
- attach files and notes to references
- search references by author, descriptor and periodical indexes

EndNote

Aalto University IT Services provides the EndNote reference manager for students, teachers, researchers and other staff of the university.

Information about installing EndNote :

<https://www.aalto.fi/en/services/reference-management-software-endnote>

Information sources at Aalto University

- **Learning Centre website** is a good starting point: *learningcentre.aalto.fi*
- **Aalto-Primo**
(https://primo.aalto.fi/discovery/search?vid=358AALTO_INST:VU1&lang=en)
- **Resource guides** identify essential databases and learn information skills
 - **Design guide**: *http://libguides.aalto.fi/design*
- **Visual Resources Centre guide** for image databases and copyright info
- **Aaltodoc** contains theses and dissertations
- **Research information portal** <https://research.aalto.fi>

Aalto-Primo

- Printed books and e-books in Aalto University Learning Centre collections
- Theses and dissertations
- Printed journals and e-journals
- Articles from international journals
- Remote access to all databases
- Primo log-in:
 - Renewals
 - Reservations
 - Fees

Other information sources

- **National Finna:** Collections of Finnish archives, libraries and museums:
<https://www.finna.fi/?lng=en-gb>
- **The National Repository Library (NRL):** <https://vaari.finna.fi/?lng=en-gb>
- **University of the Arts Library:** <https://www.uniarts.fi/en>
- **Helsinki University, Library collections :**
https://helsinki.primo.exlibrisgroup.com/discovery/search?vid=358UOH_INST:VU1&lang=en
- **WorldCat:** <https://www.worldcat.org/>
- **Google Scholar** <https://scholar.google.com>

Google Scholar will not answer all your needs

Pros of Google Scholar	Cons of Google Scholar
Familiar and relatively simple to use, much like Google.	Does not allow users to limit results to peer reviewed or full text materials or by discipline.
Variety of materials including articles, books, conference proceedings.	Coverage is wide-ranging but not comprehensive and high scholarly quality is not guaranteed.
Can display links to articles and books held through Aalto University Learning Centre.	Weeding through results not held at Aalto is time-consuming.
See how many times an article has been cited and by whom.	Citation information is not as reliable as Scopus or Web of Science information.

References – Why to cite

- Successful information retrieval is a central basis of academic writing.
- Include essential background literature in your research/thesis.
- Use academic information resources.
- Choose the best and most relevant sources.
- Study the bibliographies of good sources.
- Check the reliability of the sources you are going to use.

- The accuracy and correctness of referencing are part of a well-written publication and add credibility and reliability to your work.

References – why to cite

References support a research statement, are an expression of the research process, and can be used to criticise opposing views.

The functions of references are:

- To give credit to other authors whose materials have been used in the research.
- To illustrate the kind of previous research and existing information the research draws and builds upon.
- To give further information when useful and necessary for the reader.
- Citing is a foundation pillar of scientific communication.

References – How to cite?

- Information resources are mainly used in two ways in research: to **summarise** and to **quote**.
- The readers of the work must always be able to tell whether the information they are reading is the creator's own thought, a summary of, or direct quotation from another work.
- When summarising, the writer of the work presents relevant information from the resource in her/his own words. Quotation marks are not used.
e.g. As Herrera states ..., or According to Davis Appropriate reference mark is also required.

References – How to cite?

- Short quotations must always be presented in quotation marks. Avoid long quotations. Quotations can also be added to the text as indented paragraphs with smaller spacing and without quotation marks.
- Quotations have to be presented exactly as they are in the original resource. If you only wish to cite some of the original text, you can point out where you have omitted a part of the text by adding [...] in the quotation. If you leave out the end of a sentence in a quotation, you should express this by adding three commas at the end, followed by the punctuation mark that ends the sentence in the original text.

References – How to cite?

- Be consistent – use always the same style in your text references and bibliographic references.
- Ask your supervisor about the style
- Use guides for making the references.
- Don't copy ready-made references as such.
- The references give an overview of the quality and reliability of the research.

References – Plagiarism

- Plagiarism is the act of presenting another author's work as your own. The work can be a text or a part of it, data, an image, a translation and so on.
- Plagiarism includes also copying an academic or an artistic work of another author without permission.
- Turnitin is used in Aalto University to prevent plagiarism.

Copyright – right to cite

- According to § 22 of the Copyright Act, it is permissible to use citation from disseminated works to the extent required by the specific purpose and in accordance with fair practice.
- A separate permission from the author is not necessary. A work is considered disseminated when it has been made available to the public with the author's permission.
- The manner, in which the work is made public, is not significant.

Copyright – right to cite images

- Images (illustration, photograph or photograph of an artwork) may be cited in a scientific presentation (theses, dissertations, articles).
- Images used, must come from legal source and images should be used as a whole work of art or as a whole photograph.
- Images must be related to the text; they must illustrate and clarify the text.
- In case images have been cited according to copyright law, theses, dissertation etc. may be distributed and shared together with images on the open access repository (Aaltodoc).

Reference – citation

There are two components to referencing:

- **In-text citation** is inserted in the text directly after the information being sourced from the scientific literature.
- **Bibliographic reference** appears at the end of the work and contains sufficient information of the source.
- The bibliography contains only those bibliographic references which have been cited in the text.

Placing in-text citation

- Inside a sentence – refers to the word or words in front of the quotation.
- After comma – refers to the previous sentence.
- In the end of the sentence, before dot – refers to previous sentences.
- In the end of the sentence, after dot – refers to entire paragraph.

Placing in-text citation - example

Another remark or claim has been that from shareholders' perspective, "good design is good business" (Borja de Mozota 2006, 270-273), implying that well-designed products indirectly attract investors by leading to increased sales and better margins, more brand value, greater market share, and higher return on investment (ROI). Some consultants have also seen this to manifest in above-average stock market returns of "good-design" companies (Rich 2004, 30-35).

Reference systems

Name-year system (Harvard, APA ...)

In-text citation

- the author's last name, publication year and page numbers

Bibliography

- bibliographic references in alphabetical order
- publication year directly after author's name
- if there are several works published by the same author in the same year, they should be differentiated by adding letters a, b, c (in in-text citations and in the bibliography)

Bibliography - examples

Book (Harvard)

Milton, A. & Rodgers, P. (2011). Product Design. London: Laurence King Publishing. 307 p. [Cited 7th Feb 2022]. Retrieved from ProQuest Academic Complete.

Journal article (Harvard)

Tao, F., Sui, F., Liu, A., Qi, Q., Zhang, M., Song, B., Guo, Z., Lu, S.C.-. & Nee, A.Y.C. (2019). Digital twin-driven product design framework. International Journal of Production Research, vol. 57, no. 12. P. 3935-3953. [Cited 7th Feb 2022]. Retrieved from Taylor & Frances Online.

Journal article (APA style)

Tao, F., Sui, F., Liu, A., . . . Nee, A. Y. C. (2019). Digital twin-driven product design framework. International Journal of Production Research, 57(12), 3935-3953. Doi:10.1080/00207543.2018.1443229. Retrieved from Taylor & Frances Online.

Reference systems

Number reference system (Vancouver)

In-text citation

- a number is added in parentheses or square brackets in the appropriate place in the text, starting the numbering from 1

Bibliography

- references in chronological order i. e. the same order as they appear in the text
- year after the publication information

Bibliography - examples

Book

[1] Milton, A. & Rodgers, Product Design. London: Laurence King Publishing, 2011. 307 p. ISBN 9781780670850 (ebook). ISBN 9781856697514 (print). [Cited 7 Feb 2020]. Retrieved from ProQuest Academic Complete.

E-journal article

[2] Tao, F., Sui, F., Liu, A., Qi, Q., Zhang, M., Song, B., Guo, Z., Lu, S.C.-. & Nee, A.Y.C. Digital twin-driven product design framework. International Journal of Production Research. 2019, vol. 57, no. 12. P. 3935-3953. [Cited 7 Feb 2020]. Retrieved from Taylor & Frances Online.

Reference systems

Footnote reference system

In-text citation

- A number called a superscript is added at the end of the cited or summarised information. Normally the numbering runs consistently throughout the work.

Footnote

- The superscript numbers correspond with notes either at the end of the page (footnote) or at the end of the text (endnote). The notes state at least the author's name, the name of the publication and page numbers where the citation is from.

Bibliography

- bibliographic references arranged in alphabetical order
- year after the publication information

Footnote system

- The benefit of using footnotes is that the system does not break the structure of the text.
- You can also include additional information that supports the main text in the footnotes. For example, you can use a footnote to justify an argument, point towards important differences between different resources, explain an abbreviation or expression in the text, etc.
- Footnotes are normally written in a smaller font than the main text and separated from the text by a horizontal line.

Bibliography - examples

Book

Milton, A. & Rodgers, P. Product Design. London: Laurence King Publishing. 2011. 307 p. ISBN 9781780670850 [ebook]. ISBN 9781856697514 [print]. [Cited 7th Feb 2020]. Retrieved from ProQuest Academic Complete.

Journal article

Tao, F., Sui, F., Liu, A., Qi, Q., Zhang, M., Song, B., Guo, Z., Lu, S.C.-. & Nee, A.Y.C. Digital twin-driven product design framework. International Journal of Production Research. 2019, vol. 57, no. 12. P. 3935-3953. [Cited 7th Feb 2020]. Retrieved from Taylor & Frances Online.

Assessing search results

- It is usual that first searches do not deliver the best results, and search terms may need to be rethought.

Typical scenarios:

- search terms are too broad; too many references that are irrelevant
- search terms are too specific; too little references or no results
- search terms are too ambiguous; too many irrelevant results

If you received too many results ...

- Combine search terms with AND-operator.
- Don't truncate search terms.
- Don't expand the search with synonyms and related terms with OR-operator.
- Try more specific terminology.
- Use faceted search functions to refine the search by publication year, publication title, subject etc.
- Limit the search to academic publications or peer reviewed documents.
- Set a time limit.

If you received too few results ...

- Think around the subject; related research areas and topics.
- Find more synonyms and related terms and combine these with OR-operator.
- Find more general concepts and terms to replace some of the more specific terms.
- Use free text searching (search from all fields) and truncation of search terms.
- Are you using the correct databases for the subject?
- Browse references used in other articles and books for new search terms.

If your search results are irrelevant to your subject...

- Find more terms to describe the subject: synonyms, more narrow and specific terms.
- Are you familiar with the jargon?
- Are you familiar with all relevant databases to the subject?
- Use databases' internal thesauri to find more specific terms.
- Limit your search to academic publications and peer reviewed documents.

Assessing information sources

Source criticism means the assessment of the reliability, relevance and originality of the source.

Presentation

- Is the information well presented?
- Pay attention to the language, layout and structure.

Relevance

- Does the resource meet your research subject or answer questions around the subject? Does it take you to different directions?
- Scan the introduction and conclusions sections.
- What is the main subject and argument of the resource?

Assessing information sources

Impartiality

- Is the subject presented from all relevant viewpoints?
- Pay attention to the introduction and conclusion; how do author(s) argue a standpoint?
- Is the language emotive or neutral?
- Is the author biased or looking after their own interest?

Research methods

- What is the information and argumentation based on?
- Does the research method support the subject?
- Do you trust the information and opinions presented to you?

Assessing information sources

Sources

What is the origin and source of the information presented?

- Are the names of authors and / or organisations behind the information explicitly available?
- How was the information published?
- How authoritative and well-known is the author?
- Have you consulted a second-hand source, should you consult the primary source to confirm its validity?

Timeliness

- When was the information first published?
- Is the information still current for your subject?
- How much of the information is out of date?

A?

Aalto University

Learning Centre

Thank you!

eila.ramo@aalto.fi