Literature why, what, how

Day 2 (morning) INDØK, Research Methods Course, IND 4080
Kristin Falk, August 2019
# Course Schedule

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<td>9:00 5 step framework, meta levels&lt;br&gt;line-of-reasoning&lt;br&gt;break</td>
<td>10:00 specific initial problem statement&lt;br&gt;break&lt;br&gt;practical search techniques&lt;br&gt;refine search&lt;br&gt;lunch</td>
<td>11:00 research methods&lt;br&gt;re-iterate research design&lt;br&gt;break&lt;br&gt;data collection, interpretation, analysis&lt;br&gt;what data, how to obtain&lt;br&gt;lunch</td>
<td>12:00 re-iterate meta-levels&lt;br&gt;re-iterate research questions&lt;br&gt;how to answer them&lt;br&gt;break&lt;br&gt;data validity, bias&lt;br&gt;re-iterate problem exploration&lt;br&gt;re-visit interview/survey&lt;br&gt;lunch</td>
<td>13:00 what is a good paper?&lt;br&gt;break&lt;br&gt;discussion, what is the flow in the paper&lt;br&gt;annotate the book plan with content and scope keywords&lt;br&gt;break&lt;br&gt;lunch</td>
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<td>13:00 reflection and discussion&lt;br&gt;library resources&lt;br&gt;reflection and discussion&lt;br&gt;break</td>
<td>14:00 research questions&lt;br&gt;break&lt;br&gt;formulate initial research questions&lt;br&gt;break</td>
<td>15:00 feasibility of study&lt;br&gt;homework&lt;br&gt;break&lt;br&gt;reflection and discussion</td>
<td>16:00 reflection and discussion</td>
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### Homework
- Initial interview and/or survey: 30%
- Initial problem analysis: 60%
- Literature survey Body of Knowledge: 10%
- Search secondary data sources: 60%
- Read Research Methods paper: 60%
- Elaborate research design: 10%

### Course Objectives
- Continue literature survey: 50%
- Write critical 2-3 papers: 15%
- Identify challenges and risks in problem definition: 30%
- Make research design more concrete: 5%
- Make book plan for the course paper: 5%
- Write a course paper, ca 15 pages: 5%
- Line of reasoning: 5%
- Literature survey: 5%
- Research design: 5%
- Execution plan: 5%
- Book plan of final paper: 5%
Literature – why and where?

Why do I search for literature?

Where do I search for literature?
Why References

• The main purpose of references is to show that the authors
  – are up-to-date with the latest research central to the manuscript subject
  – are aware of the relevance of any related research
  – have an understanding of any existing drawbacks in the research
  – are aware of possible avenues of advancing the body of knowledge in this regard.
• The manuscript should include articles that contribute to the
  – contextual setting,
  – understanding, and
  – advancement of the manuscript topic.
What
- Refer to papers with high academic standard

- Trustworthiness
- Objectivity
- Accuracy
- Fitness

https://www.youtube.com/watch?v=rsSPFX55iHc&feature=youtu.be
What: Publication hierarchy

- 1. Scholarly Journals
- 2. Conference Proceedings (peer reviewed)
- 4. Internet/Mass Media (magazines, newspapers)
What: Systems Engineering Literature

Core Body of Knowledge
• www.SeBOK
• INCOSE Handbook
• NASA Handbook

Systems Engineering papers
• In Journals:
  – International Journal of Industrial and Systems engineering
  – Journal of Systems Engineering (INCOSE)
  – IEEE Systems Journal
  – …… See more in “2. How to write journal articles. Pp12”

• in Conferences

• from former SE students @USN
  – https://www.gaudisite.nl/MasterProjectPapers.html
How: Literature Review

1. Choose a topic. Define your research question.
2. Decide on the scope of your review. (# studies, # years)
3. Select the databases you will use to conduct your searches.
4. Conduct your searches and find the literature. Keep track of your searches!
5. Review the literature.

Source: https://libguides.uwf.edu/c.php?g=215199&p=1420520
How: Literature Review

4. Conduct searches

- Review the abstracts of research studies carefully. This will save you time.
- Write down the searches you conduct in each database so that you may duplicate them if you need to later (or avoid dead-end searches that you'd forgotten you'd already tried).
- Use the bibliographies and references of research studies you find to locate others.
- Ask your professor or a scholar in the field if you are missing any key works in the field.
- Keep track of the citations; eg Mendeley or End Note
How: Literature Review

5. Review the literature

• What was the research question of the study you are reviewing? What were the authors trying to discover?
• Was the research funded by a source that could influence the findings?
• What were the research methodologies? Analyze its literature review, the samples and variables used, the results, and the conclusions. Does the research seem to be complete? Could it have been conducted more soundly? What further questions does it raise?
• If there are conflicting studies, why do you think that is?
• How are the authors viewed in the field? Has this study been cited? If so, how has it been analyzed?
• Tips:
  – Again, review the abstracts carefully.
  – Keep careful notes so that you may track your thought processes during the research process.
Search Literature

- Use the research questions to determine 5 to 10 key words or phrases
- Search for relevant literature
- Identify ~10 potentially interesting papers
- Read the abstracts
- Sort on relevancy, based on abstract
- Read at least one paper

Keep notes on all papers you find
Practicalities
How to search?

• Search techniques
  – Find good keywords and concepts
  – Before you start, ask yourself:
    • Are there other words that can be used in searching, such as synonyms or related concepts?
    • Is the spelling correct?
    • Have you tried subheadings or terms in an English databases?
    • Is the search word too general or too specific?

• Getting too many results?
  – Refine the search. Most databases let you refine your search by year, language, type of publication, etc.
  – Use other specific search words. You will get better results by searching children and depression rather than child psychology.
  – Combine keywords for a more precise search.

• Getting few results?
  – Use truncation.
  – Try other words or synonyms.
  – Try to expand your search.
  – Make sure your search words are spelled correctly.

Types of search

- Search based on other papers
  - Trace papers citing Founding papers
  - Trace papers referenced in relevant papers
  - Obtain related literature reviews

- Systematic search in databases based on Research question
SYSTEMATIC REVIEWS

- **Systematic reviews** are a type of literature review that uses systematic methods to collect secondary data, critically appraise research studies, and synthesize findings qualitatively or quantitatively.
  - Establish to what extent existing research has progressed towards clarifying a particular problem;
  - Identify relations, contradictions, gaps, and inconsistencies in the literature, and explore reasons for these;
  - Formulate general statements or an overarching conceptualization
  - Comment on, evaluate, extend, or develop theory;
  - In doing these things, provide implications for practice and policy;
  - Describe directions for future research.
- Example: Lessons from applying the systematic literature review process within the software engineering domain, Brerton et al.
Recomended Search Databases

- ORIA: http://bibliotek.usn.no/
- www.GoogleScholar.com
- ScienceDirect (<www.sciencedirect.com>)
Resources

• [http://bibliotek.usn.no/cite-and-write/](http://bibliotek.usn.no/cite-and-write/)
• [http://sokogskriv.no/en/](http://sokogskriv.no/en/)
• [https://libguides.uwf.edu/c.php?g=215199&p=1420520](https://libguides.uwf.edu/c.php?g=215199&p=1420520)
• [https://innsida.ntnu.no/wiki/-/wiki/English/How+to+search+for+literature](https://innsida.ntnu.no/wiki/-/wiki/English/How+to+search+for+literature)
Reading material

3. Lessons from applying the systematic literature review process within the software engineering domain _ Elsevier Enhanced Reader.html
Refine Literature Search

- Refine the 5 to 10 key words or phrases
- Look for literature reviews
- Look for founding papers
- Use these to search for relevant papers
- Order on relevancy based on abstract

Keep notes on all papers you find