Literature why, what, how

Day 2 (morning) INDØK, Research Methods Course, IND 4080

Kristin Falk, August 2019
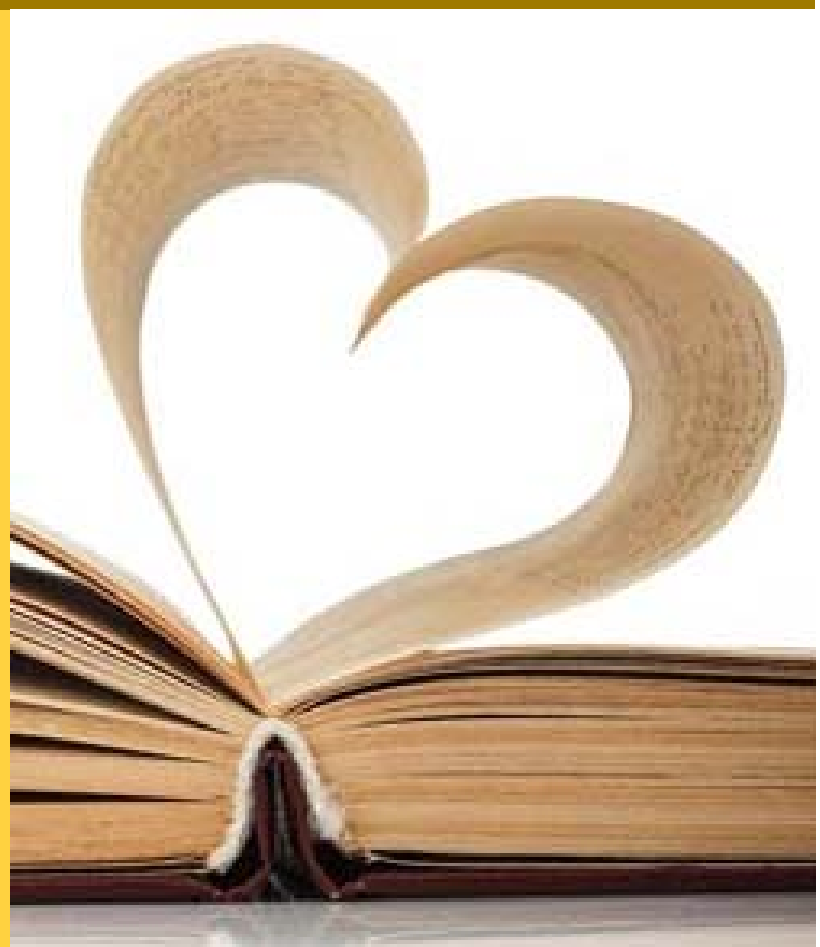
Course Schedule

	day 1	day 2	day 3	day 4	day 5
9:00	5 step framework, meta levels	literature why, what, how	research methods	re-iterate meta-levels	what is a good paper?
	line-of-reasoning	search applicable literature	re-iterate research design	re-iterate research questions how to answer them?	write an initial abstract
	break			break	break
10:00	specific initial problem statement	break	break	data validity, bias	discussion, what is the flow in the paper?
		practical search techniques	data collection, interpretation, analysis		
	problem exploration			re-iterate problem exploration	annotate the book plan with content and scope keywords
11:00	break	refine search	what data, how to obtain?		
	framing the problem, prepare interviews			re-visit interview/survey	
12:00		lunch	lunch	lunch	lunch
	lunch				
		library resources	reflection and discussion	reflection and discussion	reflection and discussion
13:00	reflection and discussion	reflection and discussion	statistics for master students, including exercises	project execution and planning	practicalities, e.g. visualizations, citations
	research questions	break		break	break
14:00	break	research design how, what to look for	break	make initial project execution plan (PERT)	make a research design diagram
	formulate initial research questions		what scale to use how to interpret the data		
		initial research design		academic writing, book plan	master project supervision and assessment
15:00	break	break	break		
	feasibility of study	break	ethics, plagiarism, privacy, confidentiality, regulations	break	break
		homework		homework	homework
16:00	reflection and discussion	reflection and discussion	reflection and discussion	reflection and discussion	reflection and discussion

homework

- initial interview and/or survey ⎫ 30%
- initial problem analysis ⎭
- literature survey Body of Knowledge ⎫ 60%
- search secondary data sources ⎭
- read Research Methods paper ⎫ 10%
- elaborate research design ⎭

- continue literature survey ⎫ 50%
- write critic of 2..3 papers ⎭
- identify challenges and risks in problem definition 15%
- make research design more concrete 30%
- make book plan for the course paper 5%

- write a course paper, ca 15 pages
- line of reasoning
- literature survey
- research design
- execution plan
- book plan of final paper

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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=rs5PFX5SIHc&feature=youtu.be

What: Publication hierarchy

- 1. Scholarly Journals
- 2. Conference Proceedings (peer reviewed)
- 3. Books and Industry/Government Studies
- 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

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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.

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How: Literature Review
4. Conduct searches

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.

- 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

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How: Literature Review
5. Review the literature

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.

- 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
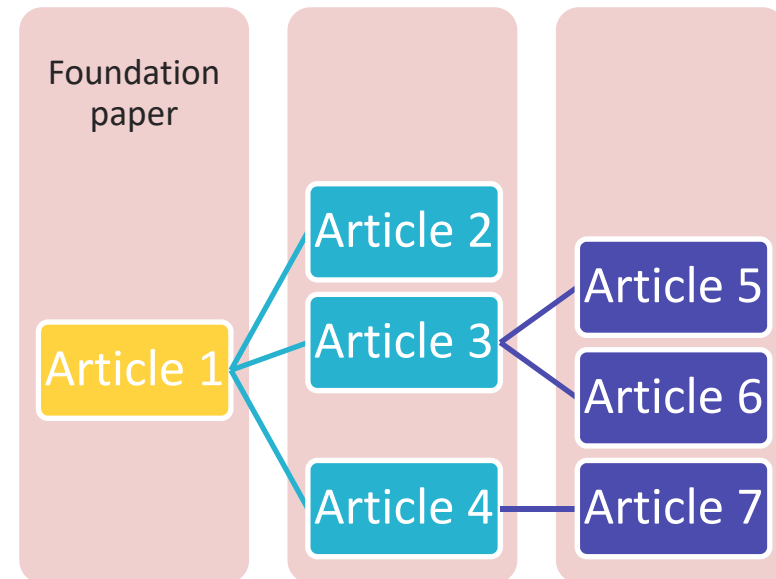
Keep notes on all papers you find

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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.

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Types of search

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

- Systematic search in databases based on Research question

Foundation paper

Article 1

Article 2

Article 3

Article 4

Article 5

Article 6

Article 7

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://sokogskriv.no/en/   SØK & SKRIV
- https://libguides.uwf.edu/c.php?g=215199&p=1420520
- https://innsida.ntnu.no/wiki/-/wiki/English/How+to+search+for+literature

Reading material

1. https://web.stevens.edu/ses/documents/fileadmin/documents/pdf/SE_Master_Project_Guidelines.pdf
2. http://etums.tums.ac.ir/FileManager/HARVARD_REFERENCING_2012.PDF

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

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