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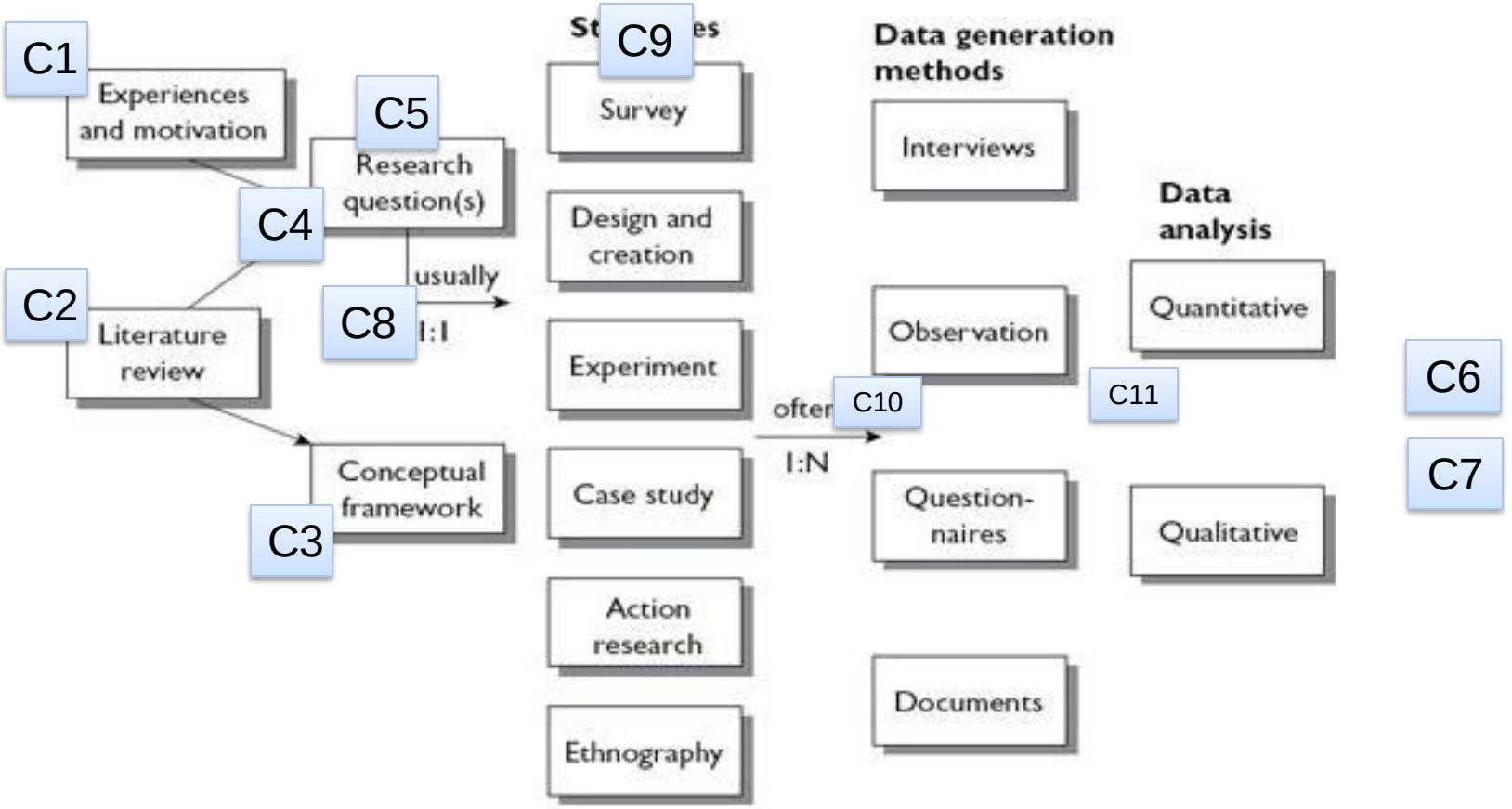
Norwegian University of Science and Technology

TDT39
Empirical Research Methodology

Autumn 2023

Evaluation criteria



Overview and weighting

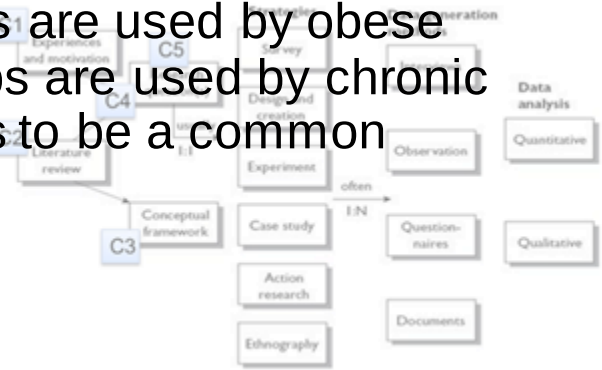
Section	%	Evaluation criteria
Purpose	30	C1: The motivation for the project is firmly developed in form of a practical problem with documented sources from both literature and media.
		C2: A gap in our knowledge is clearly stated with references to relevant research literature.
		C3: The objective for the research is clearly stated and leads clearly to the research questions.
		C4: The research questions are clearly stated and show how the research will address the gap in knowledge.
		C5: Main concepts are clearly identified and defined and belong to IS, SE, or CS.
Contribution	10	C6: The deliverables of the research study are clearly stated.
		C7: The new knowledge resulting from the deliverables is clearly described related to the knowledge gap and addresses the research questions.
Research methods	35	C8: The research strategy is described and argued for, and it is easy to see why your research questions demand such a strategy.
		C9: Other competing strategies are ruled out with good arguments.
		C10: Data generation methods are described and argued for based on strategy and RQs.
		C11: Data analysis methods are described and argued for, and show that the RQs can be answered.
		C12: Main foreseen threats to internal validity are discussed.
Participants	10	C13: Describe all participants and their roles in the research project.
		C14: Explain whether/why there is a need to involve non-researcher participants.
		C15: Discuss the ethical issues of involving non-researcher participants and how to address them.
		C16: Reflect on your own role as researcher in the project, and how it will impact the validity of your results.
Research paradigm	5	C17: Discuss and reflect upon the research paradigm you have employed, and why.
Dissemination	5	C18: Explain how your results could be disseminated beyond your final master thesis.
References	5	C19: Your list of references should be correctly formatted and include all bibliographical data of approximately 7-8 relevant scientific references that are actively used in the text
Total	**100**	

C1: The motivation for the project is firmly developed in form of a practical problem with sources from both literature and media.

- Not so good motivation:
  - We are all obese, therefore we need an exercise app.
  - RQ: How to make an app to eliminate obesity?
- A bit better:
  - We are all obese,
  - Studies [1] and [2] show that obese people used an app and lost weight.
  - Therefore, we need an exercise app.
  - RQ:
- Even better:
  - We are all obese,
  - According to studies [3] and [4] we become obese because of A and B…
  - Study [3] shows that app X managed to eliminate B because…
  - Our hypothesis is that an enhanced app Y can eliminate B and A because…
  - RQ: What is the effect of using app Y on A and B?
    - Or: How do people with A and B use app Y?

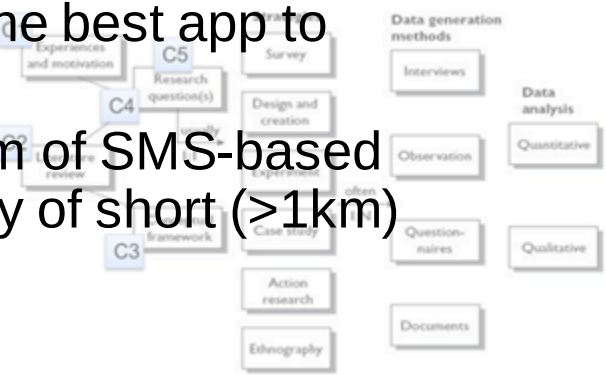
C2: A gap in our knowledge about the practical problem is clearly stated with references to relevant research literature.

- Bad:
  - No studies exist that show the effect of app X on obesity.
- A bit better:
  - Studies show that obesity conditions A and B can be addressed using exercise Y....
  - (app X can improve how people do exercise Y)
- Even better:
  - Studies [1] and [2] show how mobile apps are used by obese people. Studies [3] and [4] show how apps are used by chronic disease patients in general. There seems to be a common requirement of.....
  - (app X fulfills that requirement).



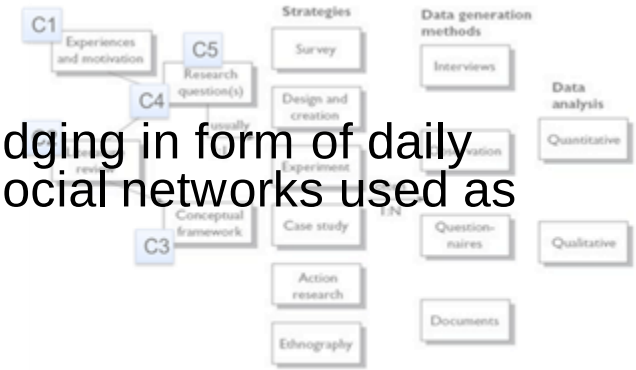
C5: Major concepts are clearly identified and defined, and belong to IS, SE, or CS.

- Concepts not belonging to IS/SE/CS:
  - Not a good RQ: How can we eradicate obesity?
  - A better RQ: What do we know about how technology X implements interaction technic Y? (through testing on a group of people with obesity because Y is relevant for obesity).
- Concepts not defined clearly:
  - Not so good RQ: How do we develop the best app to eradicate obesity?
  - Better: How does digital nudging in form of SMS-based notifications affect the weekly frequency of short (>1km) walks?



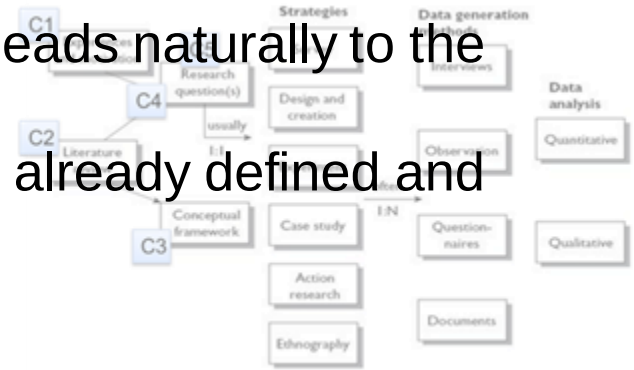
C3: The objective for the research is clearly stated and leads clearly to the research questions.

- Not so good:
  - RQ1: How can we make an app to eradicate obesity?
- Better:
  - Objective: We want to make an app to eradicate obesity!
  - RQ: What do we know about the effect of existing apps for addressing obesity?
- Even better:
  - Objective: We want to know more about the potential of mobile technologies to address obesity.
  - RQ1: How does obesity develop?
  - RQ2: What do we know about digital nudging in form of daily notifications? What do we know about social networks used as motivational channels? Etc.



C4: The research questions are clearly stated and show how the research will address the gap in knowledge.

- Not so good:
  - Research questions pop up as a surprise at the end of the purpose section.
- Better:
  - The argument in the purpose section leads naturally to the research questions.
- Even better:
  - The argument in the purpose section leads naturally to the research questions.
  - All the words/concepts in the RQs are already defined and motivate for.



C6: The deliverables of the research study are clearly stated

- This point is simply related to what you will deliver from your research. Are we talking about a report? A design concept? A product? A scientific paper?

C7: The new knowledge resulting from the deliverables is clearly described related to the knowledge gap and addresses the research questions.

- This is different from C7 in that you need to talk about the **novelty** of what you will deliver.
- Not so good:
  - Just mention what you will deliver without talking about its novelty.
- Better:
  - Relate to what you discussed in the Purpose section and show that what you will deliver is novel.
- Even better:
  - Do a more in-depth review of what else exists out there, and that what you will deliver is really **novel**.

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C8: The research strategy is described and argued for, and it is easy to see why your research questions demand such a strategy.

- Not so good:
  - You just describe a strategy without saying why you chose it.
- Better:
  - You describe your strategy and tell us why you chose it.
- Even better:
  - Your argument for choosing a strategy is closely related to your research questions.

C9: Other competing strategies are ruled out with good arguments.

- This is related to C8.
- Not so good:
  - You describe well why you chose a strategy, but don't discuss competing strategies.
- Better:
  - You mention other competing strategies but don't say why they are relevant.
- Even better:
  - You mention one or two other relevant strategies that you did not choose, and describe why.

C10: Data generation methods are described and argued for based on strategy and RQs

- Not so good:
  - You are not clear what data you are collecting and how.
- Better:
  - You describe what data you are collecting.
- Even better:
  - You describe your data generation methods, and why they are adequate for your RQs and strategy.

C11: Data analysis methods are described and argued for, and show that the RQs can be answered

- Not so good:
  - You don't write how you will analyze your data.
- Better:
  - You describe how you will analyze your data.
- Even better:
  - You argue for the specific analysis methods you describe.

C12: Main foreseen threats to internal validity are discussed

- Not so good:
  - You don't discuss internal validity at all.
- Better:
  - You reflect on how valid your results can be based on the strategy and data generation methods you have chosen.
- Even better:
  - You do a systematic analysis of internal validity and address 2-3 common validity threads for your type of research.

C13: Describe all participants and their roles in the research project

- Not so good:
  - You don't mention who will participate in your study.
- Better:
  - You have a list of potential participants.
- Even better:
  - You argue why you need to have them and what role they will play in answering your RQs.

C14: Explain whether/why there is a need to involve non-researcher participants

- This is related to C14 but is specifically focusing on non-researcher participants.

C15: Discuss the ethical issues of involving non-researcher participants and how to address them

- Not so good:
  - You don't discuss ethical issues, both with respect to non-researcher participants and researcher participants.
- Better:
  - You mention ethical issues and say you will address them but don't say how.
- Even better:
  - You show you are aware of ethical issues and have a plan for how you will address them.

C16: Reflect on your own role as researcher in the project, and how it will impact the validity of your results

- Not so good:
  - You don't do the reflection at all.
- Better:
  - You do a cursory reflection, but this is not related to your background and role in the study.
- Even better:
  - You look at 1-2 aspects of yourself (e.g. education ,age, personal beliefs) and discuss how these can affect the validity of your results.

C17: Discuss and reflect upon the research paradigm you have employed, and why

- Not so good:
  - You don't have a discussion of your research paradigm.
- Better:
  - You have a discussion of your paradigm, but this is not convincing as it does not relate to your RQs and your study.
- Even better:
  - You have a discussion of the paradigm you use based on the study you have designed and the RQs you want to answer.

C18: Explain how your results could be disseminated beyond your final master thesis

- Not so good:
  - You provide the standard answer that the results will be my Master thesis.
- Better:
  - You provide other examples of dissemination, e.g. writing a blog or making a YouTube video about your results without saying why and for whom.
- Even better:
  - You reflect on who might benefit from your results and what channel/form of dissemination might be used to reach those groups.

C19: Your list of references should be correctly formatted and include all bibliographical data of approximately 7-8 relevant scientific references that are actively used in the text

- Not so good:
  - You don't have a reference list, or the reference list has a lot of missing bibliographic data.
- Better:
  - You have a complete reference list of 7-8 references in your reference list.
- Even better:
  - All the references in your reference list are actively used in your text and it is easy to see why they are relevant.

- Tips for correct formatting: Use a bibliography tools such as BibTeX or Zotero.

Some general observations

- We don't need to know your plans for your autumn project or your master thesis!
  - This is a course about writing research plans in general.
- You tend to jump too early to the conclusion/solution.
  - Do a proper problem analysis and write a good motivation (for your grandfather/grandmother).
- You are not careful about the quality of your sources.
  - Don't use Google. Use Google scholar or Scopus or Web of science.
- You don't spend enough time on searching for, reading and analyzing relevant literature.

Some general observations

- You hide your objectives in form of research questions.
  - Don't be shy about your objective (I want to make an app), but separate it from RQs (what do I need to know before I make an app?).
  - Don't forget to write a good motivation! (Why do I need to make an app?)
- You tend to be absorbed by the practical problem and you forget that you are a computer science researcher!
  - I want to eradicate obesity! I want to save the environment!
- You don't read the book! And as a result, you use generic concepts and text that anyone would have spent five minutes writing it.