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Some experiences about analysis and writing

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Agenda

1. Reflections on your own writing
2. My own receipe for analysis and writing it up (method + analysis)
3. Examples from two cases (method + analysis)
4. Writing up an article/thesis – how do I do it? (intro, related work, findings, discussion, conclusion)
5. Some useful references
6. Questions and discussion

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1. Reflections on your own writing

Some warm-up reflections – take 3 minutes

- Do you have any experiences with **writing up analysis**?
- What do you find **difficult about analysis**?
- What do you find **joyfull about analysis**?
- What is it **difficult about writing, in general**?
- **When** does the **analysis start**?
- Do you prefer to wait until the end of a project to start writing, or do you write small bits of text throughout the process («micro-writing»)?

Personally, I find…

- Difficult to write when I do not have any (empirical) data
- Difficult to write when I have too much data
- Difficult to write when I did not do a proper analysis
- Difficult to write the discussion
- Difficult to write when I have a long text
- Difficult to write when I did not read enough about a subject

Is there anything that you find easy to write?

- When are you in the ”flow” of writing?
- What ”puts you” in the flow of writing?
- When do you find it easy to start writing?

Personally, I find….

- Easy to write when I have a **shorter text**, that I feel **I can manage**.
- Easy to write if I have longer texts (scientific article) and **I did a good** (read *proper*) **analysis**.
- Easy to write when **I enjoy the topic**.
- Easy to write when **I know the structure of the text** (headings, subheadings)
- Easy to write when **I read enough about the topic** and I can bring inspiration from the articles that I read.
- Easy to write when **I have reflected enough on my work**.

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2. My own receipe for writing

My own «writing» receipe for writing up a scientific article (or thesis)

1. I choose first **the method** of analysing my data (supposely I have some data collected).
2. I **analyze the data** by applying the chosen method.
3. I **document every step** that I make in the process of analyzing the data (through text, photos, excel files, NVIVO software, notes)
4. I **write the method** first.
5. Then I **write the findings**.
6. Then I chose my analytical concept or theoretical construct (fitting my findings).
7. I write eventually a related work, if needed.

8. I write the background then, introduction, and I give another iteration on the initial RQ.

9. I write the discussion, based on my findings, theoretical concept chosen, and eventually related work (if any).

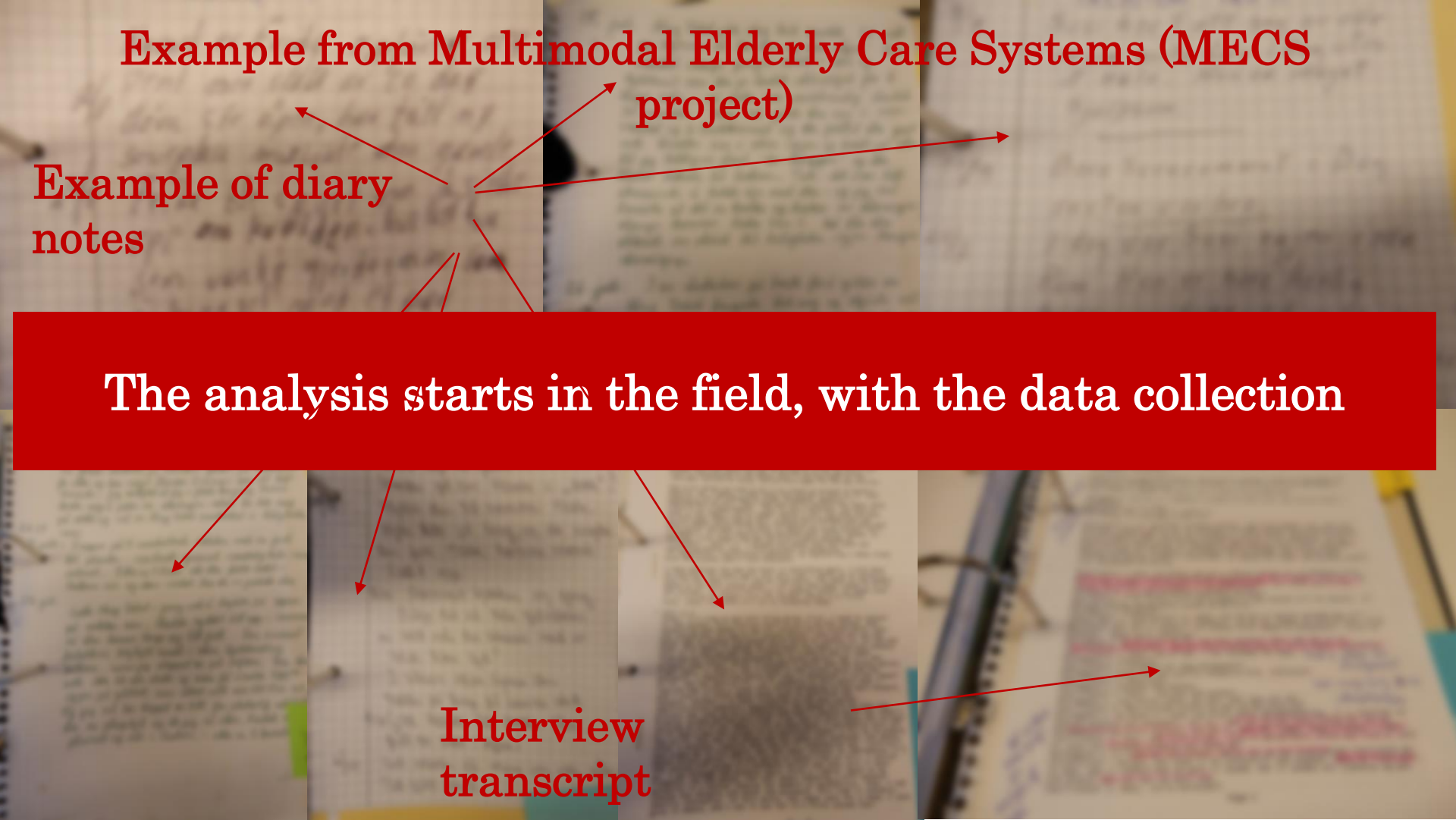
10. I write the conclusion.

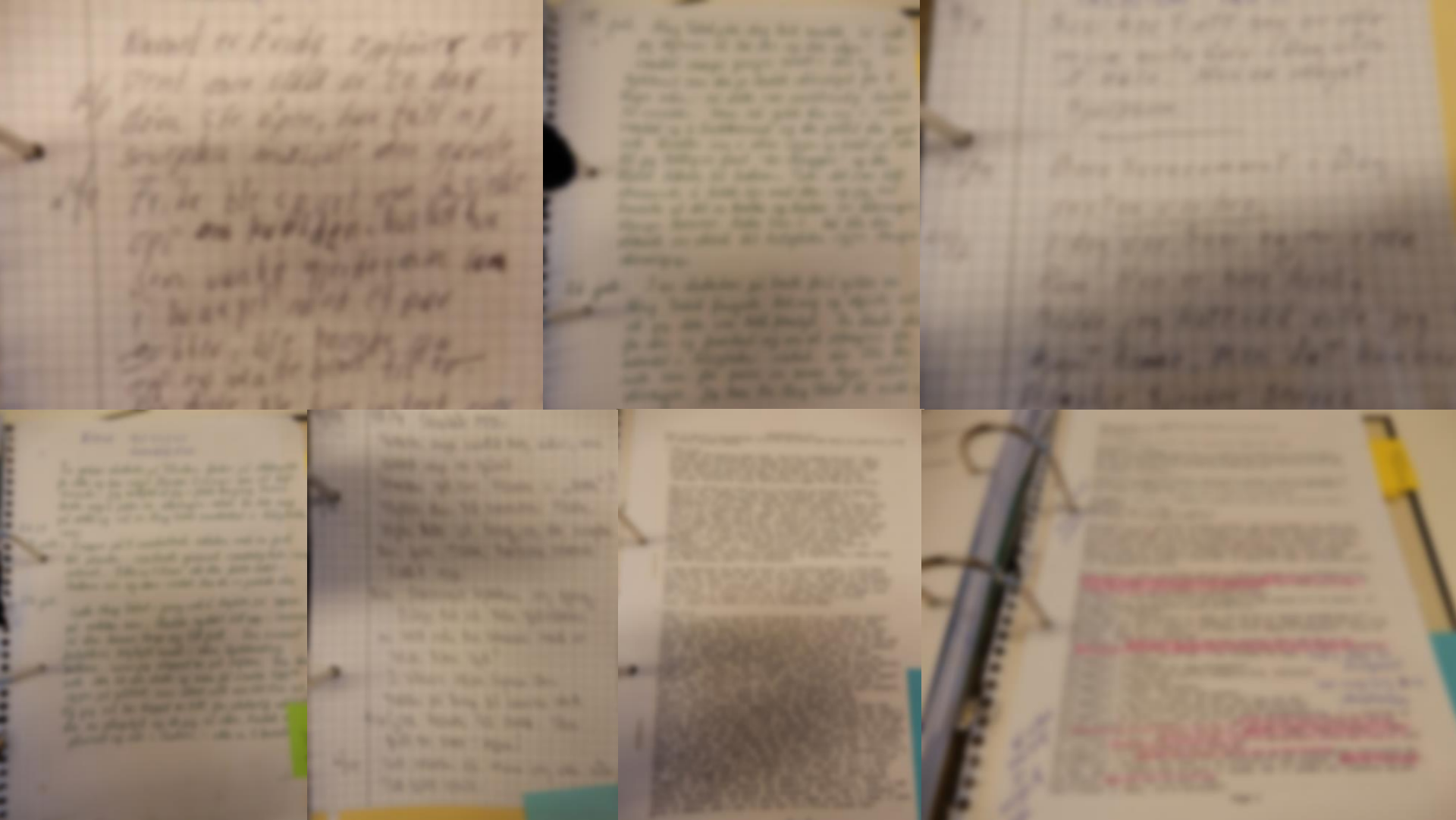
11. I come back to Introduction.

12. I re-iterate through introduction, background, discussion, conclusion (and the other parts if needed).

13. I write the abstract at the end.

14. The title is re-iterated and perhaps finally chosen. (I usually have an idea about the title in the start, but often it slightly changes by the end of writing.)


Example from Multimodal Elderly Care Systems (MECS project)
Example of diary notes
The analysis starts in the field, with the data collection
Interview transcript



Why writing first the method?

- because it's mainly «**reporting**» what I have done.
- It gives me a feeling of **control over the writing** when I see that I **produce «some text»**
- I have some **standard subheadings** that I know I should include in my method
  - **Study context** (where the study took place: e.g., Southern Norway, organization X etc.)
  - Perhaps **study design**, including a temporal perspective (e.g., this study took place over X months, X years; from 2018-2020 etc.)
  - **Participants:** how many, how they were recruited (e.g., personal contact, snowball effect, through a partner organization etc.), who were they (elderly over 65 years old, researchers, experts, adults between X-Y years etc.)
  - **Data collection methods** (interviews, semi-structured interviews, workshops, focus groups, group interviews, photos, diary notes, log reports, documents, headnotes etc.)
  - **Data analysis methods** (thematic analysis, latent and manifest content analysis, Systematic Text Condensation (STC), discourse analysis etc.)
  - **Ethical considerations** (e.g., the study was assessed by the Norwegian Ethical Board (NSD), informed consent was obtained etc.)
- It speeds up my writing because I know where and how to start

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3. Examples from two cases

Goal for today

- Examples of methods used for analysing data and writing it up from two research projects

MECS
Multimodal Elderly Care Systems

UDFeed

Case 1: Understanding the use of robots in the home

MECS

Multimodal Elderly Care Systems

Case 2: Understanding the use of Digital Learning Environments in Higher Education

Example 1: Thematic analysis (Braun & Clarke, 2006) in MECS project

Table 1 Phases of thematic analysis

Phase	Description of the process
1. Familiarizing yourself with your data:	Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas.
2. Generating initial codes:	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3. Searching for themes:	Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes:	Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis.
5. Defining and naming themes:	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.
6. Producing the report:	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

Example 1: Thematic analysis - writing it up (Braun & Clarke, 2006)

G. Data Analysis

The process of analysis started already while being in the field, as a form of doing some preliminary work [72, 134]. This has been followed by a multiple stage analysis process, where the data went through some analytical filters. Specifically, we have followed thematic analysis from V. Braun [illegible] V. Clarke to analyze the data collected in stage 2) and 3) [73]. This was done in 5 steps. We have first started by trying to familiarize ourselves with the data (step 1). We did this by creating a map of data and resources, which later resulted in Table II, respectively Table III. At this stage, we had put aside the initial research question, to be open for novelty, for what may come up and we did not think of, trying to focus on what the participants found interesting. Thereafter, our analysis was done in a bottom up fashion starting from coding each of the resources (step 2). We have then grouped the resources in three categories based on the data sources: researcher's diary, researcher's observation notes during elderly's observation and elderly's own diary notes, and interviews. At this point, the raw data became textual data, in the form of transcribed interviews, notes, or interview summaries. All the interviews with the elderly were transcribed verbatim by author SD. The transcribed interviews alone resulted in around 26000 words exclusive the pilot interview (together with the pilot interview ca 33500 words). [illegible] the author (SD) went through the photos taken (n=147). The coding was done by reading the material "line-by-line [illegible] identify and formulate all ideas, themes, or issues they suggest, no matter how varied and disparate" [74, 143]. This resulted in a variety of scattered codes.

Next step was collating the codes further into sub-categories for each of the data sources (step 3). This was done through color coded post-it notes by the author (SD). We cannot claim a full inter-reliability of the study, as the coding was done by one author (SD) [75]. However, following [75], validity, in this case, is not of "a particular concern", as the study focuses on exploring the potential challenges one may encounter when a robot is introduced in the home [75, 212]. Moreover, the findings were discussed at different points during data collection amongst the researchers in the project. In addition, the collated codes were discussed by the authors (SD, HJ) during the data analysis.

As a result, the data collected through researcher's diary, researcher's observation notes and elderly's diary notes, and interviews resulted in [illegible] respectively [n=124] collated codes: a total of [n=222] codes. At this stage, we were searching for themes. We observed that some of the collated codes were present across several of the resources: written utterances during our drop-in visits (usually once per week, or on request), and utterances from the interviews. We

TABLE III. OVERVIEW OF THE DATA COLLECTED FROM THE ELDERLY

#	Data collection methods - elderly					
	Gender (Female F, Male M)	*Interview*	*Elderly's Diary notes*	*Researcher's notes*	*Photoswere taken by the researchers*	*Eventual details about the robot used, if any assistive technologies were used, and level of information technology literacy*
1	F	Ca 1 hour, audio-recorded pilot interview, transcribed verbatim (SD) AND Ca 1 hour and 45 minutes of untranscribed audio-recording from the installation of the robot	Yes. Ca 5 A4 pages, analogue format.	Yes. Ca 2 A4 pages.	Yes. 36 photos	iRoomba, 87 years old, walking chair, did not use the app
2	F	Ca 40 minutes, audio-recorded, transcribed verbatim (SD)	Yes. Ca 3 A4 pages notes, analogue format	Yes. Ca 2 A4 pages.	Yes. 4 photos.	iRoomba, walking chair, necklace alarm that she does not wear it, high interest in technology, used the app, has a smartphone,
3	M	Ca 25 minutes, audio-recorded, transcribed verbatim (SD)	Yes. One letter-size page, analog format, short notes.	Yes. Ca 4 letter-sized pages.	Yes. 10 photos.	Neato, wheelchair, not interested in technology, did not used the app, easy to use, has a wearable safety alarm
4	F	Ca 33 minutes audio-recorded, transcribed verbatim (SD)	Yes. One A4 page, analog format	Yes. Ca 2 A4 pages.	Yes. 36 photos	iRomba, wheelchair, interested in technology, did not use the app, easy to use, does not have a smartphone, wearable safety alarm
5	F	Ca 45 minutes audio-recorded, transcribed verbatim (SD)	Yes. One letter size page, analog format.	Not available	Yes. 13 photos	Walker, did not use the app, not interested in technology, does not have a smartphone, wearable safety alarm
6	F	Ca 43 minutes, audio-recorded, (transcribed verbatim) (SD)	Yes. 4 letter-size pages, analog format.	Yes. Ca 1 letter-sized page.	Yes. 16 photos	Interested in technology, no walker, wanted to use the app, but gave up, does not have any wearable alarm

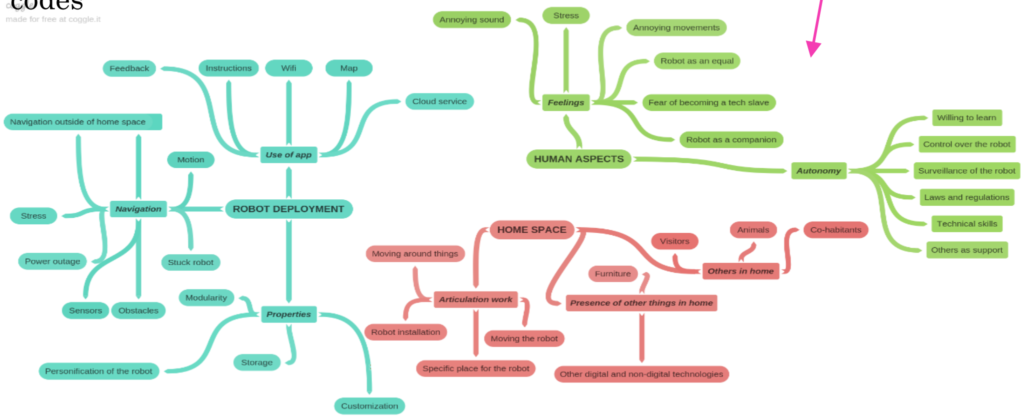
Total number of words in the interviews transcript

Total number of photos

Description of data analysis steps.

Total number of resulted codes

Themes



Reference: Saplacan, Diana & Herstad, Jo (2019). An Explorative Study on Motion as Feedback: Using Semi-Autonomous Robots in Domestic Settings. *International Journal on Advances in Software*. ISSN 1942-2628. 12(1&2), p. 68- 90.

Saplacan D, Herstad J, Tørresen J, Pajalic Z. A Framework on Division of Work Tasks between Humans and Robots in the Home. Multimodal Technologies and Interaction. 2020;4(3)

Example of findings written in the form of a table (with a "positivist" touch of writing)

TABLE II. OVERVIEW OF THE DATA COLLECTED FROM RESEARCHERS

#	Data collection methods - Researchers		
	Timeframe	*Documentation*	*Robot used*
1	One week	Yes. Diary notes, seven posts (one per day), ca 4 and a half A4 pages, analog format, 28 photos	Neato
2	Ca two week	Yes. 3 pages of A4 notes, digital format, 4 photos enclosed	Neato
3	Ca one week	Yes. Short notes on strengths and weaknesses of using such a robot, digital format	iRobot
4	One week	Yes. 1 page of notes, digital format	Samsung PowerBot
5	Ca one week	Yes. Half page was written notes on strengths and weaknesses, digital format	Neato
6	Ca one month	Yes. Four pages of written notes, 22 posts, digital format	Neato
7	Ca one month	Yes. Ca 19 A4 pages of written notes, analog format	Neato

TABLE III. OVERVIEW OF THE DATA COLLECTED FROM THE ELDERLY

#	Data collection methods - elderly					
	Gender (Female F, Male M)	*Interview*	*Elderly's Diary notes*	*Researcher's notes*	*Photoswere taken by the researchers*	*Eventual details about the robot used, if any assistive technologies were used, and level of information technology literacy*
1	F	Circa 1 hour, audio-recorded pilot interview, transcribed verbatim (SD) AND Circa 1 hour and 45 minutes of untranscribed audio-recording from the installation of the robot	Yes. Circa 5 A4 pages, analogue format.	Yes. Circa 2 A4 pages.	Yes. 36 photos	iRoomba, 87 years old, walking chair, did not use the app
2	F	Circa 40 minutes, audio-recorded, transcribed verbatim (SD)	Yes. Circa 3 A4 pages notes, analogue format	Yes. Circa 2 A4 pages.	Yes. 4 photos.	iRoomba, walking chair, necklace alarm that she does not wear it, high interest in technology, used the app, has a smartphone,
3	M	Circa 25 minutes, audio-recorded, transcribed verbatim (SD)	Yes. One letter-size page, analog format, short notes.	Yes. Circa 4 letter-sized pages.	Yes. 10 photos.	Neato, wheelchair, not interested in technology, did not used the app, easy to use, has a wearable safety alarm
4	F	Circa 33 minutes audio-recorded, transcribed verbatim (SD)	Yes. One A4 page, analog format	Yes. Circa 2 A4 pages.	Yes. 36 photos	iRomba, wheelchair, interested in technology, did not use the app, easy to use, does not have a smartphone, wearable safety alarm
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6	F	Circa 43 minutes, audio-recorded, (transcribed verbatim) (SD)	Yes. 4 letter-size pages, analog format.	Yes. Circa 1 letter-sized page.	Yes. 16 photos	Interested in technology, no walker, wanted to use the app, but gave up, does not have any wearable alarm

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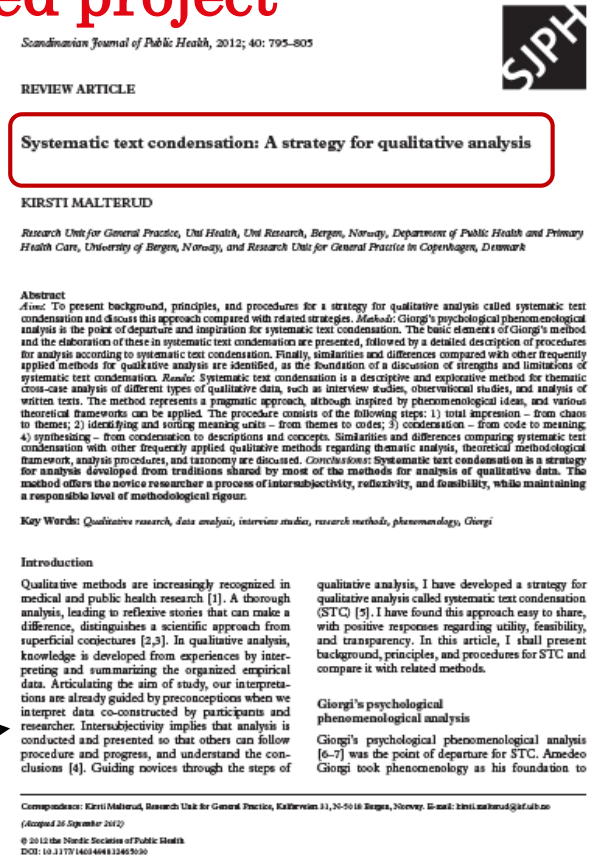
Example 2: Data analysis using Systematic Text Condensation (STC) from UDFeed project

- Method used in analysing the data collected through semi-structured interviews with course instructors
- Defining Digital Learning Environments (compare to Learning Management Systems)

"DLEs are defined here as digital platforms, websites or specific webpages used by course instructors and students in a course for exchanging information or knowledge, relevant for their learning, respectively teaching, within the frame of the course. In a course, a course instructor can use one or more such DLEs: for instance, the course instructor can use both a dedicated Learning Management System (LMS), the email system, the HE website, and a social media platform or channel dedicated to the course. Each of these is considered individually as a DLE when they are used for the purpose of teaching/learning. We will call in this paper the individual DLE as a DLE unit. Therefore the terminology used here is not LMS but rather DLEs." (Saplacan, D., 2020)

STC "strategy" not a method per se → make it to "your own" (Malterud, K., 2012)



Scandinavian Journal of Public Health, 2012; 40: 795–805

REVIEW ARTICLE

Systematic text condensation: A strategy for qualitative analysis

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Abstract

Aims: To present background, principles, and procedures for a strategy for qualitative analysis called systematic text condensation and discuss this approach compared with related strategies. *Methods:* Giorgi's psychological phenomenological analysis is the point of departure and inspiration for systematic text condensation. The basic elements of Giorgi's method and the elaboration of these in systematic text condensation are presented, followed by a detailed description of procedures for analysis according to systematic text condensation. Finally, similarities and differences compared with other frequently applied methods for qualitative analysis are identified, as the foundation of a discussion of strengths and limitations of systematic text condensation. *Results:* Systematic text condensation is a descriptive and explorative method for thematic cross-case analysis of different types of qualitative data, such as interview studies, observational studies, and analysis of written texts. The method represents a pragmatic approach, although inspired by phenomenological ideas, and various theoretical frameworks can be applied. The procedure consists of the following steps: 1) total impression – from chaos to themes; 2) identifying and sorting meaning units – from themes to codes; 3) condensation – from code to meaning; 4) synthesizing – from condensation to descriptions and concepts. Similarities and differences comparing systematic text condensation with other frequently applied qualitative methods regarding thematic analysis, theoretical methodological framework, analysis procedures, and taxonomy are discussed. *Conclusions:* Systematic text condensation is a strategy for analysis developed from traditions shared by most of the methods for analysis of qualitative data. The method offers the novice researcher a process of intersubjectivity, reflexivity, and flexibility, while maintaining a responsible level of methodological rigour.

Key Words: *Qualitative research, data analysis, interview studies, research methods, phenomenology, Giorgi*

Introduction

Qualitative methods are increasingly recognized in medical and public health research [1]. A thorough analysis, leading to reflexive stories that can make a difference, distinguishes a scientific approach from superficial conjectures [2,3]. In qualitative analysis, knowledge is developed from experiences by interpreting and summarizing the organized empirical data. Articulating the aim of study, our interpretations are already guided by preconceptions when we interpret data co-constructed by participants and researcher. Intersubjectivity implies that analysis is conducted and presented so that others can follow procedure and progress, and understand the conclusions [4]. Guiding novices through the steps of qualitative analysis, I have developed a strategy for qualitative analysis called systematic text condensation (STC) [5]. I have found this approach easy to share, with positive responses regarding utility, feasibility, and transparency. In this article, I shall present background, principles, and procedures for STC and compare it with related methods.

Giorgi's psychological phenomenological analysis

Giorgi's psychological phenomenological analysis [6–7] was the point of departure for STC. Amedeo Giorgi took phenomenology as his foundation to

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Example 2: Data analysis using Systematic Text Condensation (STC) from UDFeed project

Step 1. Total impression → from chaos to themes

- "This initial step is accomplished in an armchair or sofa, resisting all temptation to systematize. When finished, we ask ourselves which preliminary themes can be identified in the material – four to eight matters concerning the participants in relation to […]"
- "Three to six of these are given priority for further analysis."

Step 2. Indentifying and sorting meaning units – from themes to codes

- " In the second step of analysis we sit by our computer, identifying and organizing data elements that may elucidate the study question"
- We start by systematically reviewing the transcript **line by line** to identify **meaning units**.
  - A meaning unit is a text fragment containing some information about the research question."
  - "Meaning units, short or long, are not limited to sentences or remarks. You should rather include too much than too little."

Step 3. Condensation – from code to meaning:

- systematic abstraction of meaning units within each of the three to six code groups established in the second step of analysis.

Now we sort the meaning units of the actual code group into a few subgroups

Step 4. Synthesizing – from condensation to descriptions and concepts

- data are reconceptualized putting the pieces together again.
- "Now we make sure that our synthesized results still reflect the validity and wholeness of their original context."

(Malterud, K., 2012)

	I	Filtering		Prioritization	
1	cultural diversity and knowledge exchange	diversity	1	1	social/human diversity
2	Different DLE	Different DLE	2	2	Different DLE
3	adaptation and configuration	Interactivity	3	3	DU
4	Universal Design	DU	4	3	DU
	II				
5					al/human Diversity
6					al/human diversity
7					nization
8					nization
9	lack of awareness about DU (only in speacil education)	DU	4		DU
	III				
5	adult teaching	diversity	1	1	social/human Diversity
6	digital divide	Digital Divide/Immigrants	5	1	social/human Diversity
2	different DLE	Different DLE	2	2	Different DLE
10	interactivity in the platform	Interactivity	3	2	Different DLE
2	non-official DLE	Different DLE	2	2	Different DLE
11	institutional barriers	Organization	6	4	Organization
	11 birds-eye view --> filtered into 6 matters (reccommended 4 to 8 matters) --> filtered into 3 to 6 themes --> here the 4 above				

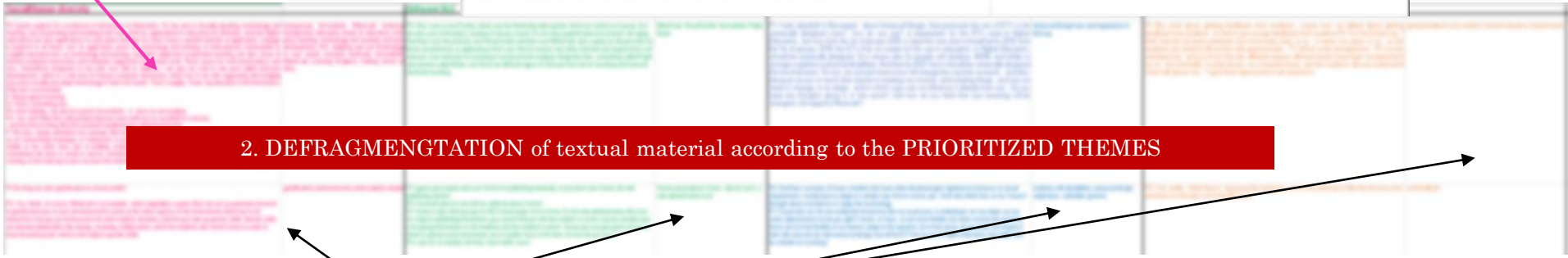
1. Identifying THEMES and PRIORITZING them (done on paper, now the results are transferred into Excel)

References where I have used the method from Malterud, K. (2012):

- Saplacan, D. (2020). Cross-Use of Digital Learning Environments in Higher Education: A Conceptual Analysis Grounded in Common Information Spaces. *In Proceedings of the Thirteenth International Conference on Advances in Computer-Human Interactions (ACHI),* ISSN 2308-4138, p. 272-281.
- Saplacan, D., Herstad, J, Pajalic, Z. (2020). Use of Multiple Digital Learning Environments: A Study About Fragmented Information Awareness. *Interaction Design and Architecture(s) Journal, nr. 43, Special Issue,* ISSN 1826-9745

Original text from the transcript (anonymized, unidentified participant)

3. IDENTIFYING MEANING UNITS for ONE THEME



2. DEFRAGMENGTATION of textual material according to the PRIORITIZED THEMES

Colorcodes

Theme 1: Social human diversity	#	subgroup
background	1	participant background
technical background	1	participant background
education	1	participant background
levels of education	1	participant background
work place learning	1	participant background
technology and learning	1	participant background
end-user development	1	participant background
HCI	1	participant background
research methods	1	participant background
background	1	participant background
adapting and use technology to own needs	3	adaptive systems
adaptation on the go	3	adaptive systems
making sense of data	4	research
gamification	5	teaching
immersion into semi-realistic situations	5	teaching
generic skills	5	teaching
specific skills	5	teaching
combining skills	5	teaching
teaching emploees	5	teaching
, introduction to technology,	5	teaching
teacher has to explain how to use the technology	5	teaching
, using the system in a pedagocical way,	5	teaching
digital environment not introduced to students	5	teaching
did not encountered different users with disabilitie	6	no user diversity
no diversity of users	6	no user diversity

4. SORTING the MEANING UNITS into subgroups of codes

5. Subgroups of codes into CONDENSATES

participant background	(DLE)	UD rules	
DLE	cross platform experience	univ policy	(feedback)
adaptive systems	DLE properties	(DLE)	(evaluation)
research	(teaching)	external tools	academic line
teaching	participant interview	(functionality)	academia
no user diversity	(functionality)	(user diversity)	(implementation)
inclusion	(UD)	(UD)	(UD)
situated disability	(user diversity)	adaptive systems	administration
user diversity	institutional barriers	user in control	(DLE)
learning	(user experience)	configuration options	(functionality)
creating room	(implementation process)	risks	

Unique values	#CATEGORIES	#
participant background	background	1
research	background	1
teaching	background	1
participant interview	background	1
DLE	DLE	2
adaptive systems	DLE	2
functionality	DLE	2
cross platform experience	DLE	2
DLE properties	DLE	2
DLE adds-on	DLE	2
DLE agenda	DLE	2

6. FINAL CATEGORIES of CONDENSATES

FINAL CATEGORIES
DLE
User diversity
UD
Organization

NEXT STEP:
1. Write up findings'
2. Search for CSCW concept

human needs		system design		user experience	user diversity	3
metadata		(user diversity)		user in control	user diversity	3
UD		market		unexpected situations	user diversity	3
trade offs		cross platform distribution		technology acceptance	user diversity	3
functionality		(background)		inclusion	UD	4
user experience		(DLE properties)		situated disability	UD	4
implementation		(implementation)		creating room	UD	4
		evalutation		system barriers	UD	4
TOTAL = 23 subrgoups	TOTAL = 13 subgroups	rebel		lack of feedback	UD	4
		technology acceptance		system in control	UD	4
				system design	UD	4
		TOTAL = 25 subgroups		lack of human dimension	UD	4

Code numbers, so I can easily sort the data in Excel and trace back to the original quotes

Example of writing up the findings (Course instructors' voices from the interviews)

Participant X: "So I think that more dedicated tools are fine. But the main problem is that may be that there is no common approach by lecturers in what they use. So, one holds their lecture material on [C], one holds it on [A], one holds it on their USB key, whatever. So, it's very difficult for students to understand where to find the material, if all the material is there, and when it is uploaded and so on, and so on. I see the problem not in using 20 tools, but in using 20 different tools in doing the same job. So, it would be nice if we were using much fewer tools when it comes to content and holding, to chats, to whatever, and to, of course, project deliveries. I think it would be much easier for the students to have these tools of choices."

Participant Y: "I wish that everything was in one system"

Participant X again: "Absolutely, I do have a strong opinion on this. In the sense that, that I don't really like the idea of building a **mammoth**, doing it all, because it is not really possible for a software doing it all, like discussion, and courses, and projects, and everything. If you try to build a **mammoth**, then everybody would want a different thing. F: By a mammoth you mean?
PX: **A big elephant**. So, if you try to build something big that it will try to do it all, then it's no success."

«Writing through codes» (Crang and Cook, 2007)

Contradictive views → OK: it shows variation in your data

#	Participant (Course Instructor) Systems used in a Higher Education Institution	#1	#2	#3	#4
1	Publishing system	X		X	X
2	Internal submission system	X	X	X	(X)
3	Internally and externally used submission and assessment system	X		(X)	
4	External communication system				X
5	External quiz and input system 1	X		X	X
6	External quiz and input system 2	X			X
7	Administrative system		X		
8					
9					
10					
11	Third party application		(X)		
12	External quiz application		(X)		
13	Social media platform 1		(X)		
14	Social media platform 2		(X)		
15	Web service for forum discussions and wikis		(X)	X	
16	MOOC platform				X
17	Examination platform				X
18	Screen and speech recorder software				X

Example of findings written in the form of a table (with a ”positivist” touch of writing)

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4. Writing up an article/thesis – how do I do it? (intro, related work, findings, discussion, conclusion)

Why I write the findings after writing the method part?

- Because if I have the analysis done and well documented, it's really easy to write up the findings.
- I use the codes, themes, transcripts to write up the findings
- If the analysis is done well, I have already the findings sorted into categories or themes
- I use the codes/labels as keywords to help me remember what I found out in each of the categories
- When I want to emphasize specific findings, or findings that are representative for a specific theme, I trace back to the transcripts and try to find out a good quote from my participants.

Representing findings – in the form of TEXT

- You should separate your findings from your own reflections and discussion
- Findings should be represented by what you found out
- Report the ”findings”, without introducing literature/references in this section
- Do not ”argue” or reflect here for- or against your findings – just report them
- You will argue for (or against) and reflect on your findings in the discussion section
- no ”digressions” from what has been said by your participants, or what you found out in the document analysis, photos, observations etc.

Introduction

- What is the paper/thesis about
- RQ
- How you answer your RQ
- Limitations
- Outline of the paper/thesis
- Background

Identifying a theoretical concept and apply to your findings

- There are different models of applying the theory
- Check out Beck & Stolterman (2015) for those of you who are interested in these models

Figure 1 The "no theory" model.

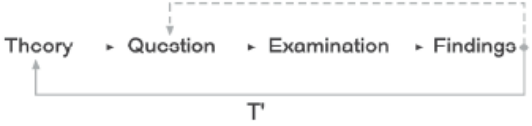


Figure 2 The "theory as object" model.

My preferred style based on Beck and Stolterman (2015) is this one

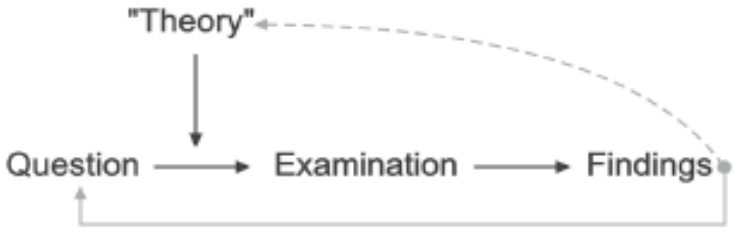


Figure 3 The "theory as contextual tool" model.

Figures taken from Beck & Stolterman (2015)

Related work

- What others have done that is related to your work, but perhaps a bit outside of your specific focus area
- Example: Writing about other studies on the use of robots in the home, when your paper is about a specific type of robots in the home (e.g., vacuum cleaner robots, assistive robots)

Method + Findings

- We have discussed this earlier in the lecture (see previous slides ☺)

Discussion

- What did I found out?
- How do my findings relate to the concept identified?
- Anchor your discussion in the earlier presented theory/literature review
- What do others say?
  - Refer to others that confirm your research, or have similar findings
  - Refer to others that may have other views on what you present
- Discussion is perhaps ”most difficult” to write (at least for me!)
- Do not come with too much ”new literature” and concepts that was not written in your Theory section/chapter, related work, introduction
- Try to represent your main findings (after you have discussed them) with an appropriate figure, if relevant

Conclusion

- It is not a summary!
- Condensate and present your contribution: **take-away** points from your study

5. Some useful references

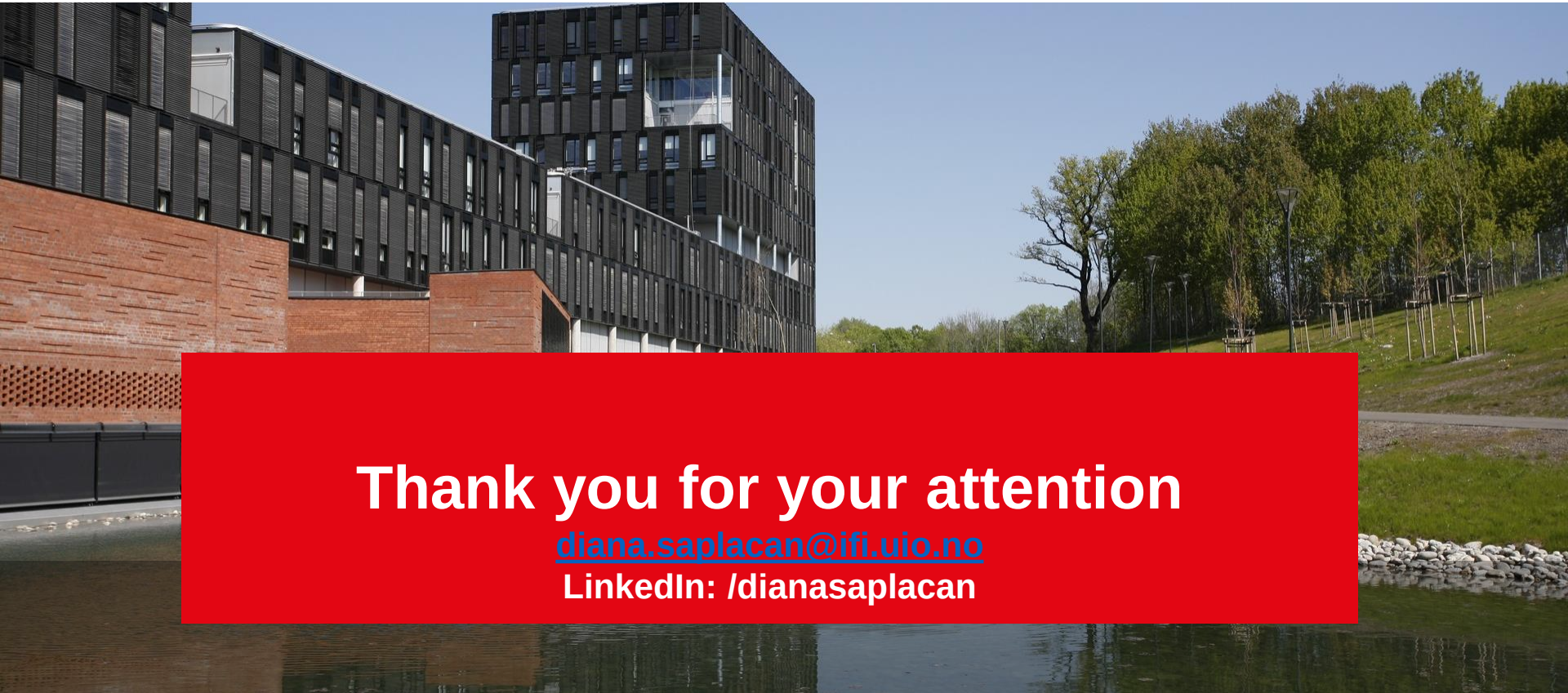
Methods that I have used in my research **to analyze the data**, and their corresponding references:

- **Thematic analysis:** Braun, Virginia, and Victoria Clarke. 2006. "Using Thematic Analysis in Psychology." *Qualitative Research in Psychology* 3 (2): 77–101. https://doi.org/10.1191/1478088706qp063oa.
  - See example of thematic analysis applied in Saplacan, Diana & Herstad, Jo (2019). An Explorative Study on Motion as Feedback: Using Semi-Autonomous Robots in Domestic Settings. *International Journal on Advances in Software*. ISSN 1942-2628. 12(1&2), p. 68- 90.
- **Systematic Text Condensation (STC):** Malterud, Kirsti. 2012. "Systematic Text Condensation: A Strategy for Qualitative Analysis." *Scandinavian Journal of Public Health* 40 (8): 795–805. https://doi.org/10.1177/1403494812465030.
  - See example of STC applied in Saplacan, D. (2020). Cross-Use of Digital Learning Environments in Higher Education: A Conceptual Analysis Grounded in Common Information Spaces. *In Proceedings of the Thirteenth International Conference on Advances in Computer-Human Interactions (ACHI),* ISSN 2308-4138, p. 272-281.
- **Qualitative manifest and latent content analysis**: U. H. Graneheim and B. Lundman, "Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness," Nurse Educ. Today, vol. 24, no. 2, pp. 105–112, Feb. 2004.
  - See example of qualitative manifest and latent content analysis applied in: Saplacan, D., Herstad, J., Pajalic, Z. (2020). An analysis of independent living elderly's (≥65 years) views on robots and welfare technology – A descriptive study from the Norwegian context, *in Proceedings of the Thirteenth International Conference on Advances in Computer-Human Interactions (ACHI),* ISSN 2308-4138, p. 199-208.
- **Story Dialogue Method (SDM)** (OBS! SDM is both a **data collection and a data analysis method**): Labonté, Ronald. 2011. "Reflections on Stories and a Story/Dialogue Method in Health Research." *International Journal of Social Research Methodology* 14 (2): 153–63. https://doi.org/10.1080/13645579.2010.492131.
  - Saplacan, D., Herstad, J, Pajalic, Z. (2020). Use of Multiple Digital Learning Environments: A Study About Fragmented Information Awareness. *Interaction Design and Architecture(s) Journal, nr. 43, Special Issue,* ISSN 1826-9745

- On **theory models**: Beck, Jordan, and Erik Stolterman. 2016. "Examining Practical, Everyday Theory Use in Design Research.", *The Journal of Design, Economics, and Innovation* 2 (2): 125–40. https://doi.org/10.1016/j.sheji.2016.01.010.

6. Questions & discussion

The best way to learn a method is to try it yourself.
☺



Thank you for your attention

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