Assignment 3

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1 Activity Description: Learning to Read

No one will today deny the importance of literacy and being able to read. More specifically, literacy skills have been the focus of numerous surveys, including those within the framework of the PISA survey under the auspices of the OECD (Andersen, 2022). Scholars in reading pedagogy have repeatedly pointed out that adequate reading skills have far-reaching consequences for the ability to learn in general, i.e. factors that have nothing to do with either vocabulary or reading. That is, mainly, the rationale behind our choice to study *learning to read activity* with Danish primary-school-age children.

Figure 1: Freya is reading a book

Learning to read is a developmental process that requires plenty of time and effort on the part of children, and not least their parents. More specifically, primary school teachers in Denmark repeatedly stress the importance of reading and encourage parents to spend at least 20 minutes every day on reading with their six- or seven-years-old kids.

After having carried out a preliminary inquiry into the activity in question (Andersen, 2022; Bruun, 2017; Hinge & Carboni, 2020), largely to our surprise, we discovered that very few Danish parents manage to read with their children on a day-to-today basis.

Some commentators point out that one of the main reasons behind that is parents' lack of time and their often busy work schedule. Others have also emphasised the complexity of interaction between a novice (i.e. child) and a parent (i.e. an expert) while engaging in a reading activity. More specifically, a switch from the parent-child to a teacher-pupil relationship may, in some cases, have an inhibiting effect on the child's motivation and willingness to acquire reading skills.

In this respect, therefore, one of the main purposes of the report at hand is to uncover the desires and needs of parents and their children for a successful reading activity, not least the possibility of designing and using technology-based interactive systems that might enhance and strengthen children's learning.

2 Conducting Contextual Interviews

2.1 Preparation

To prepare for our contextual interviews we used the different phases of User Research. In the first phase, we identified the target users as children in primary school and their parents. We then discussed what our goals with the interviews were. In line with Hornbæk et al. (2022), our main goal was to understand and get to know the users and the problem at hand. Next up was to decide on a research method. According to Beyer and Holzblatt (2015), in contextual design the data is usually gathered by going out and observing while talking to test participants. That is why we decided to use observation and open-ended interviews as our research methods. For our user sample we chose to interview two parents and observe one of the parents reading with their child as well. Our main focus would thus be on the observation. We chose parents over children for this initial phase of the research as we felt it would be easier to involve children in the process at a later stage, where a prototype would be developed and we could then see the interaction and hear the children's input.

Figure 2: Phases of User Research (Hornbæk et al 2022)

Since the first interview was mostly about the observation of a child reading with a parent, we only prepared a few basic questions about who they were and what they were doing and how they felt about reading. For the other interviews we prepared questions about reading.

The first questions were about reading in general, i.e. whether children enjoy it, how important was it to read with the children everyday, did they actually manage to read every day, and if not why not. The second part of the questions was about what happened when they were reading together. For instance, how did they tackle new and difficult words. The last questions were about feedback — how to give feedback and its importance.

Children in primary school	Parents of the children
• Want it to be fun and easy to use • Practice reading and learn new words	• Want it to be easy for the children and themselves • Want the children to practice reading • Want to follow progress/follow along • Want to spend less time on the activity

Figure 3: User groups

2.2 Interviews

The first contextual interview was carried out by asking Freya and her father a few introductory questions we had prepared before they started reading together. We then observed them reading and asked them a few final questions before finishing the first interview. See Figure 4 for details on the questions.

The next interview was with Martin, Freya's father. In addition to asking the prepared questions, we also listened to his ideas about what would be a requirement for a potential solution and his thoughts about reading every day. The last interview we did was with Kristine, who has a daughter in the first grade. This interview was conducted over the phone. We listened to her thoughts and answers to the questions.

Overall, we think our interviews went very well. The most difficult part was to just listen and observe and really understand the users. When we observed Freya and her father, we tried not to interrupt at all and just let them read together. Another thing was that a phone interview was not optimal, as one might miss out on details when you cannot see the person that is being interviewed. It might also have been more optimal for us to observe more children reading with their parents as the experience is different for every user, and that would give a better and more detailed picture of the "average" user.

1. Hej Kristine! Tusind tak for du fandt tid til at tale med mig i dag.

   Jeg ved at forældre i Liljas klasse bliver bedt om at læse hver dag med deres barn i mindst 20 min.
   Jeg kunne godt tænke mig at spørge lidt til det, hvis det er ok med dig?

2. **Kan** Lilja godt **lide** at læse? Er det noget hun gør med **glæde**?

   (**Hvad** tror du kan få hendes oplevelse **mindre smertefuldt**?)

3. Tror du det er **vigtigt** for Lilja at **du er med** når hun skal læse?
   Kan hun finde på **selv** at tage en bog ned fra hylden og begynde at læse?

4. **Hvad** kan gøre hende mere **motiveret** til at læse? (ros).

5. **Hvor vigtigt** er det at Lilja får læst 20 minutter hver dag?

6. **Hvor ofte** får du og Lilja læst sammen?

   (**Hvis IKKE ofte**): Hvad er den primære årsag til I ikke får læst hver dag?

   (**Hvis IKKE ofte**): Hvad synes du ville være den ideelle løsning på den manglende tid?
   (Evt. have bedstemor/ bedstefar/ barnepige/ app til det?)

7. Jeg kunne også godt tænke mig at høre **hvad der sker** når du og Lilja læser sammen.

   - Plejer du at læse teksten for din datter inden hun skal læse?

- **Hvad** plejer du at gøre når Lilja **har svært ved** et eller andet ord?

- **Plejer du** at komme med <u>nogen</u> **forklaringer** hvis Lilja har svært ved at gennemskue konteksten?

- **Synes** du det er **vigtigt at rette** på Liljas udtale hver gang hun læser noget forkert?

- Bliver Lilja bedre til at læse, hvis hun **IKKE får** *immediate* **feedback** fra en voksen?

- **Roser** du hende hver gang det er lykkedes hende med at læse et langt eller svært ord rigtigt?

- **Synes** du det er **vigtigt** at **give ros**?
   Er det noget du gør når I læser sammen?

- **Giver** du hende nogen **"præmier"** for at være dygtig til at læse?
   (Hvis ja): Hvilken slags præmier?
   (Hvis nej): Kunne du finde på at gøre?

8. Så vil jeg sige tusind tak for dine svar og for du fandt tid til at tale med mig i dag.

Figure 4: The questionnaire for our interviews

3 Data Analysis

In brief, the Affinity Diagram is a tool that allows its users to organize ideas and data. In this report, the diagram is built on the basis of a contextual investigation of a father reading with his young daughter described in the section above — in the hope of teaching her how to read. Based on the videos of the reading session, the group behind this report wrote down ideas, quotes and thoughts onto a multitude of random-ordered, post-it notes — each note containing only a single idea. These were then grouped by main points or main issues, then by larger areas of interest, and finally by themes.

3.1 Our Affinity Diagram

We ended up grouping our post-it notes into the following main subcategories (cf. "The Affinity Diagram - Lær at Læse", Figure 7) :

1. The users' own thoughts on the process;

2. The users' description of the process;

3. Learning pronunciation;

4. Guessing words;

5. Difficult words;

6. Encouragement;

7. Evaluation.

These were then grouped into the following areas of interest :

1. The need for an app;

2. Helping the user face issues along the way;

3. Evaluation.

Finally, we decided that these areas of interest would all fall under the same overarching category **learning to read**.

In making this Affinity Diagram, we were forced to consider each observation from our field data in its own right. Moreover, we were forced to reflect on what it could tell us about the user's needs and wants. And in doing this, we started looking for certain patterns in the data, which ultimately allowed us to see a meaningful structure in our otherwise complex field data (Beyer & Holzblatt, 2015).

3.2 Insights based on Affinity Diagram

These considerations and reflections led us to the following insights: the overall purpose of our app will be "learning to read". The method for achieving this is partly the school teaching its pupils to read, and partly the parents reading with their child for 20 minutes a day. The issue with the latter method is that parents are often too busy and forgetful to find the time for reading with their child. This ultimately means that the child does not get the practice she/he needs.

The process thus consisted of three basic steps : 1) the parent remembering his reading duty, 2) the parent reading with his child - correcting it along the way, 3) the parent summing up the child's achievement and giving her words of encouragement and praise.

With these insights in mind, it is now evident what functions our app will need to have. The app should be able to 1) remind the parents of their reading duties; 2) correct the child's pronunciation (i.e. the app needs some kind of voice recognition element) and teach the child new words (e.g. through contextual hints or images); 3) praise the child's achievements and evaluate on the child's progress.

3.3 Brainstorm

In the brainstorming process at the foundation of this report, we adhered to Osborn's rules for brainstorming (Hornbæk, 2022): initially focusing on quantity of ideas, withholding criticism, welcoming strange inputs, as well as combining and improving on ideas. Moreover, we also losely followed the 10+10 method. Thus we agreed on a definition of the design challenge that we would try to solve: getting your child to read for 20 minutes every day. We generated 10 different ideas to solve this challenge: virtual reality, online tutors, audio guides - just to name a few. We chose the most promising of these - a reading app - and we came up with 10 details for this idea: voice recognition, contextual hints for difficult vocab, encouraging comments, etc.

Based on this brainstorming session, we deduced some general points about our design idea: our reading app would need to be interactive, be adjusted to the child's age and schooling level, and ideally, it would be customizable such that the child's teacher could upload the relevant texts for the child. Regarding the features of the app, it would need to a) help the child with pronunciation; b) give hints for guessing words; c) explain new words; and d) encourage and steer the child's progress.

3.4 Why are these features important to the users ?

Now that we have produced an Affinity Diagram and looked at the steps behind our brainstorming process, we can go on to consider some of the aspects of the user's practice. To do this we will refer (briefly) to some of the models mentioned in Beyer and Holzblatt (2015). The activity of reading, for instance, might be enlightened by the Relationship Model (Beyer & Holzblatt, 2015). The Relationship Model focuses on important relationships in the user's life and how these relate to the target activity. In our case the prime relationship involved is the parent-child relationship, and the target activity is that of reading together. In reading with a child, it is likely that the parent will invoke a sense of both authority and trust. While it might be difficult to transfer the aspect of authority to our reading app, it does not seem an impossible endeavour to maintain the trusting atmosphere of the parent-child reading situation. After all, most children today are used to interacting with with their phones and ipads, the app-guided reading process would still take place in the parents' vicinity, and the phone would be placed in the child's Teddy Bear - all in all making sure that the element of trust is maintained.

One could also consider the Identity Model (Beyer & Holzblatt, 2015) in relation to our reading situation. After all, teaching a child to read is not only teaching the child words and pronunciation, but it is also teaching the child that it can trust its own ability to read and its own intuition in the reading activity. Thus, it will be an important job for our app, to encourage and support the child in developing its identity as "someone who can read". We suggest that the app does this through short encouraging comments telling the child how many pages it has read, how many new words it has managed to learn, etc.

4 Prototype: Reading App "Læs & Lær"

4.1 The app

"Læs og Lær" is an application created for smartphones. As the app is opened, the screen shows the words "Læs og Lær" in stylized letters, as well as a picture of the application mascot, Benny the Bear. In the bottom of the screen is a rectangular button that says "Begin" in large letters.

If the phone is not properly connected to the physical teddy bear, this button will instead be greyed out and say "ATTACH TO BENNY" (the role of Benny the Bear will be explained in detail later on in this section).

In small letters beneath the button it says "PLAY UNATTACHED", allowing the application to run without being attached to the bear. In the upper right corner is a cogwheel icon, that upon being pressed, opens a drop down menu, containing various options. These include options like notification settings, global volume settings, as well as an option to fully reset one's reading progress.

After pressing the begin button, the user is brought to a new screen. If it is the first time that the application has been launched, it will ask for the user's grade or age. This will decide the selection of books the user will see on the following screen.

On the main screen, a selection of books will appear with their titles as well as a little illustration to grab the user's attention. The circular book buttons will have a black outline, that turns gold once the books have been completed. More books will be visible, but these will be greyed out, until they have been unlocked.

As the user progresses, more difficult books with more pages will unlock. In the corner of the main screen is a wardrobe icon. Pressing this icon will open up a screen showing the mascot Benny the Bear wearing any accessories that has been unlocked - here the user can choose which of the unlocked accessories Benny should wear.

When a book is selected, a pop-up screen shows a large version of the illustration, as well as the reading level, and the number of pages. On the bottom of this pop-up, is a button called start. When this button is pressed, the screen changes.

On the top of the new screen is the title of the book, and in the top left is a red arrow that closes the book if pressed. The current progress will be saved if exit.

In the middle of the book page is the text as well as any potential illustrations. The words of the story page will be read aloud once, and then the user selects each individual word, and say them out loud. Voice recognition will check if the pronunciation is correct. If the user fails a word more than once, tips will appear, ranging from pronunciation tips, to the word being read aloud once more. In addition to this, there is a small loudspeaker icon next to the text. When this is pressed, the entire page is read aloud once more. When a word is pronounced correctly, it turns green. When all words are green, the application automatically turns to the next page and updates the page number in the bottom left of the screen.

When all pages have been completed, a small animation of Benny the Bear will appear on screen, ranging from a couple different options. Accessories will be unlocked that can be enabled in the wardrobe icon on the main screen. This is to improve incentive to progress in the game. After pressing a button called "Good job!", the user is brought back to the main screen, and can select another book.

4.2 Benny the Bear

To add further incentive, the application is intended for use with a physical teddy bear. The phone is attached on the stomach of the teddy bear, and with bluetooth, the phone and the bear interconnect. This allows the teddy bear to vibrate, and make sounds as the play progresses on the application. The bear can also express encouragement, and give voice to the digital mascot in the application - all done in order to immerse the user in the game experience.

To fully illustrate and describe the desired design and functionality, creating a prototype of the application "Læs Lær" is ideal. For this prototype, a paper prototype of the application has been constructed, as well as a small video showing a possible interaction with the software. The video in question shows what a potential first time interaction might look like. The user opens the app, selects his/her reading level, and completes a book. Afterwards, the user enables the accessory that he/she unlocked. The video can be accessed with the following link:

https://drive.google.com/file/d/1InvlFcla14-dyx17mGHuvjjCoxof9zSe/view

For pictures of the paper prototype : see appendix 8-11.

5 Appendix

(23. Feb 2022. Hjemme hos Martin og Freya. Freya er syv år og går i 1. klasse, og Martin er hendes far.)

Interviewspørgsmål	Interviewedes Svar
1. Hvad hedder I?	1. "Freya.[] Og jeg hedder Martin."
2. Hvad skal I lave?	2. "Vi skal læse."
3. Er det noget I laver hver dag?	3. "Vi skal læse hver dag i 20 min. [...] Det siger skolen. "
Efter den udførte læseaktivitet	
4. Kan du lide at læse?	4. "Ja."
5. Er det noget du får gjort hver dag?	5. "Næsten."
6. Tror du du vil kunne læse alene, hvis far eller mor ikke havde tid til at sidde med dig?	6. Nikker.
7. Kan du lide at far hjælper dig med at læse? At han fortæller dig med hvordan man skal læse og udtale? Og hjælper dig med forskellige hints?	7. "Uhu. [...] Ja."
8. Og hvad synes du, far? Er det noget der er tid til til dagligt?	8. "Vi glemmer det nogle gange. Får ikke gjort det hver dag. [...] Så det kunne fint hvis bamsen hjælp at lære dig at læse, ikke også, Freya? (Freya nikker.)

Figure 5: Interview with Freya and her father.

1. Hej Kristine! Tusind tak for du fandt tid til at tale med mig i dag.

   Jeg ved at forældre i Liljas klasse bliver bedt om at læse hver dag med deres barn i mindst 20 min.
   Jeg kunne godt tænke mig at spørge lidt til det, hvis det er ok med dig?

2. **Kan** Lilja godt **lide** at læse? Er det noget hun gør med **glæde**?

   (Hvad tror du kan få hendes oplevelse **mindre smertefuldt**?)

3. Tror du det er **vigtigt** for Lilja at **du er med** når hun skal læse?
   Kan hun finde på **selv** at tage en bog ned fra hylden og begynde at læse?

4. **Hvad** kan gøre hende mere **motiveret** til at læse? (ros).

5. **Hvor vigtigt** er det at Lilja får læst 20 minutter hver dag?

6. **Hvor ofte** får du og Lilja læst sammen?

   (Hvis IKKE ofte): Hvad er den primære årsag til I ikke får læst hver dag?

   (Hvis IKKE ofte): Hvad synes du ville være den ideelle løsning på den manglende tid?
   (Evt. have bedstemor/ bedstefar/ barnepige/ app til det?)

7. Jeg kunne også godt tænke mig at høre **hvad der sker** når du og Lilja læser sammen.

   • Plejer du at læse teksten for din datter inden hun skal læse?

   • **Hvad** plejer du at gøre når Lilja **har svært ved** et eller andet ord?

   • **Plejer du** at komme med nogen **forklaringer** hvis Lilja har svært ved at gennemskue konteksten?

   • **Synes** du det er **vigtigt at rette** på Liljas udtale hver gang hun læser noget forkert?

   • Bliver Lilja bedre til at læse, hvis hun **IKKE får** *immediate* **feedback** fra en voksen?

   • **Roser** du hende hver gang det er lykkedes hende med at læse et langt eller et svært ord rigtigt?

   • **Synes** du det er **vigtigt** at **give ros**?
   Er det noget du gør når I læser sammen?

   • **Giver** du hende nogen **"præmier"** for at være dygtig til at læse?
     (Hvis ja): Hvilken slags præmier?
     (Hvis nej): Kunne du finde på at gøre?

8. Så vil jeg sige tusind tak for dine svar og for du fandt tid til at tale med mig i dag.
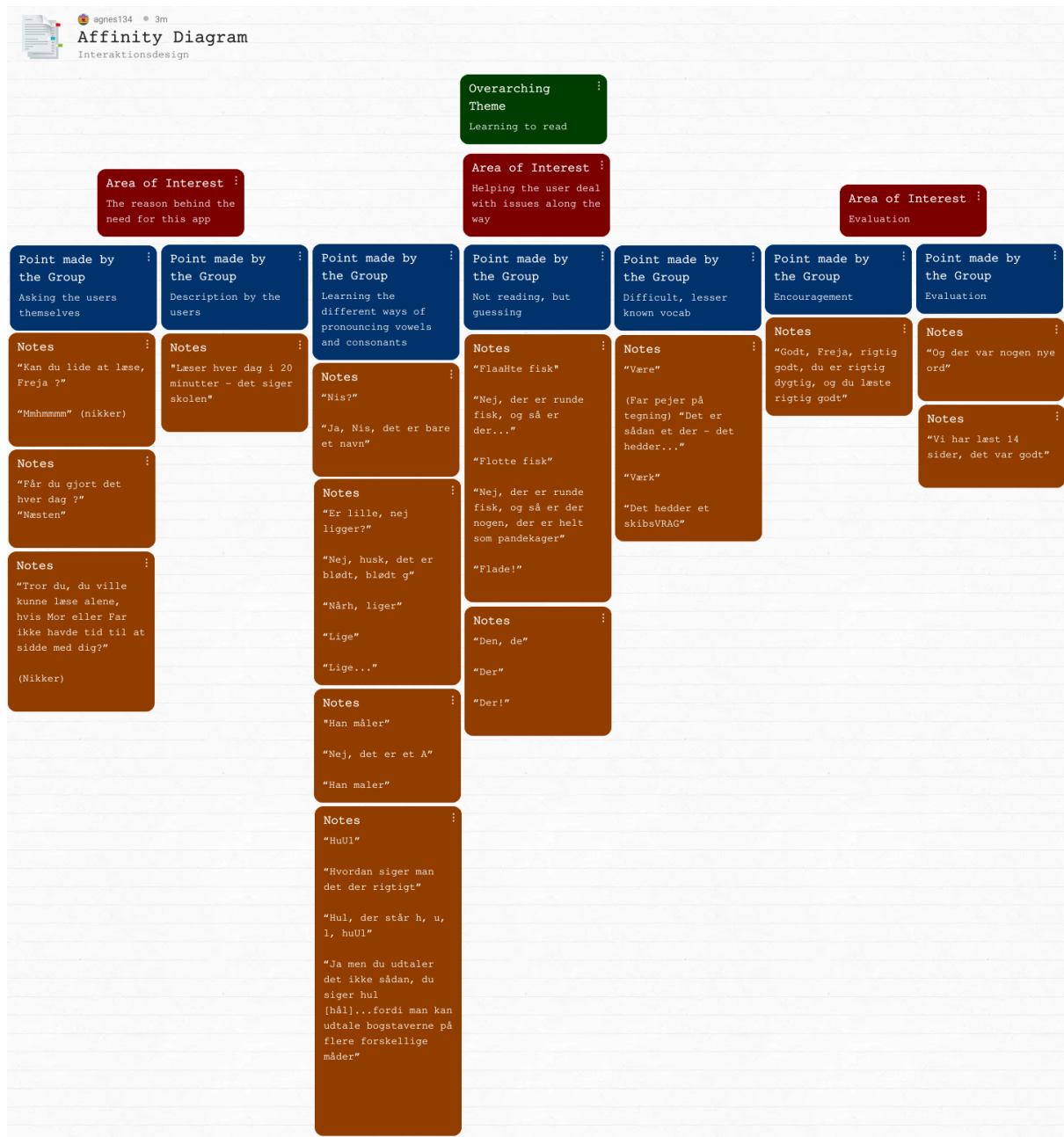
Figure 6: Interview questions

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Affinity Diagram
Interaktionsdesign

Overarching Theme
Learning to read

Area of Interest
The reason behind the need for this app

Area of Interest
Helping the user deal with issues along the way

Area of Interest
Evaluation

Point made by the Group
Asking the users themselves

Point made by the Group
Description by the users

Point made by the Group
Learning the different ways of pronouncing vowels and consonants

Point made by the Group
Not reading, but guessing

Point made by the Group
Difficult, lesser known vocab

Point made by the Group
Encouragement

Point made by the Group
Evaluation

Notes
"Kan du lide at læse, Freja ?"

"Mmhmmmm" (nikker)

Notes
"Får du gjort det hver dag ?"
"Næsten"

Notes
"Tror du, du ville kunne læse alene, hvis Mor eller Far ikke havde tid til at sidde med dig?"

(Nikker)

Notes
"Læser hver dag i 20 minutter – det siger skolen"

Notes
"Nis?"

"Ja, Nis, det er bare et navn"

Notes
"Er lille, nej ligger?"

"Nej, husk, det er blødt, blødt g"

"Nårh, liger"

"Lige"

"Lige..."

Notes
"Han måler"

"Nej, det er et A"

"Han maler"

Notes
"HuUl"

"Hvordan siger man det der rigtigt"

"Hul, der står h, u, l, huUl"

"Ja men du udtaler det ikke sådan, du siger hul [hål]...fordi man kan udtale bogstaverne på flere forskellige måder"

Notes
"FlaaHte fisk"

"Nej, der er runde fisk, og så er der..."

"Flotte fisk"

"Nej, der er runde fisk, og så er der nogen, der er helt som pandekager"

"Flade!"

Notes
"Den, de"

"Der"

"Der!"

Notes
"Være"

(Far pejer på tegning) "Det er sådan et der – det hedder..."

"Værk"

"Det hedder et skibsVRAG"

Notes
"Godt, Freja, rigtig godt, du er rigtig dygtig, og du læste rigtig godt"

Notes
"Og der var nogen nye ord"

Notes
"Vi har læst 14 sider, det var godt"
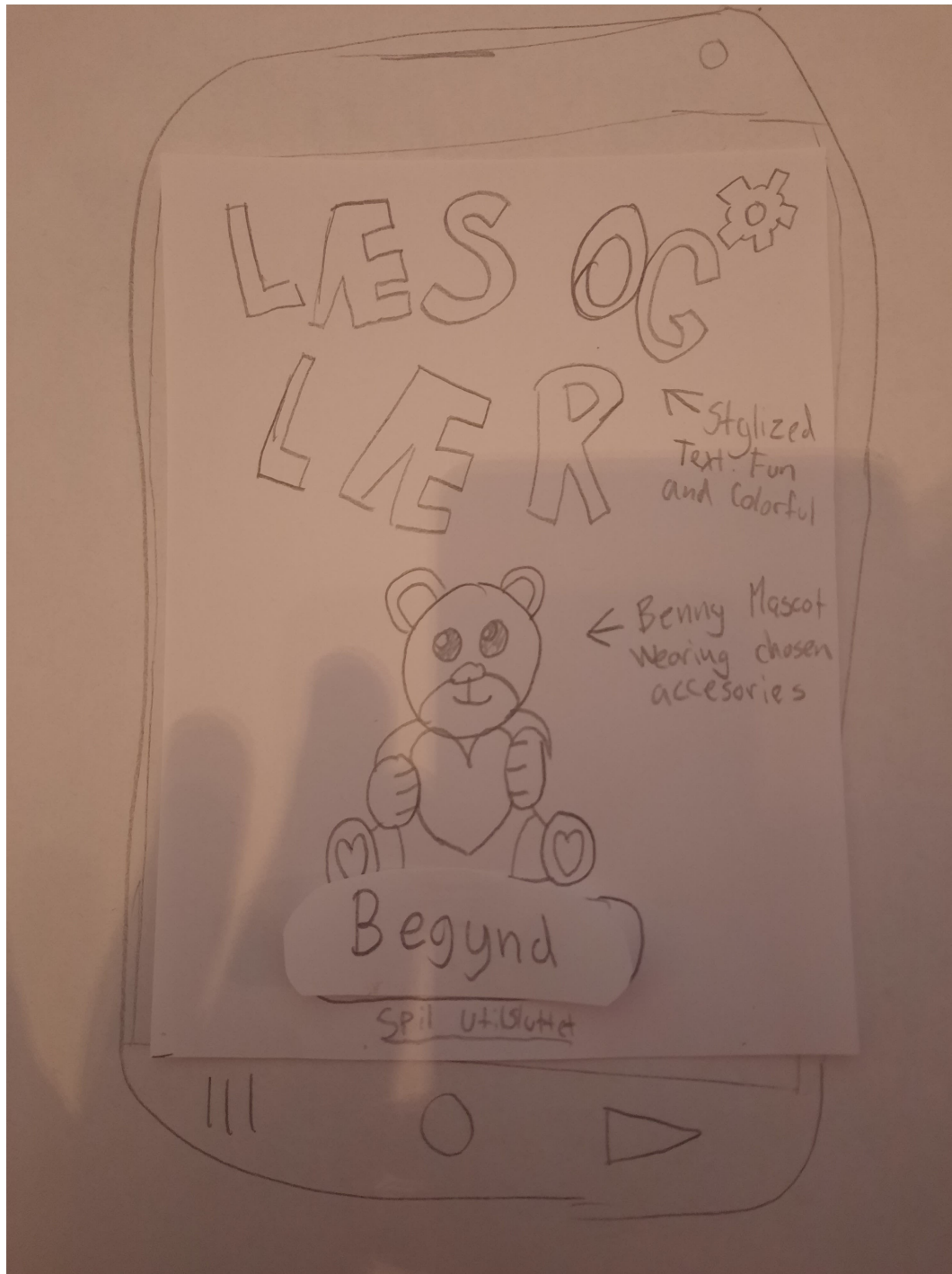
Figure 7: Affinity Diagram - Lær at Læse
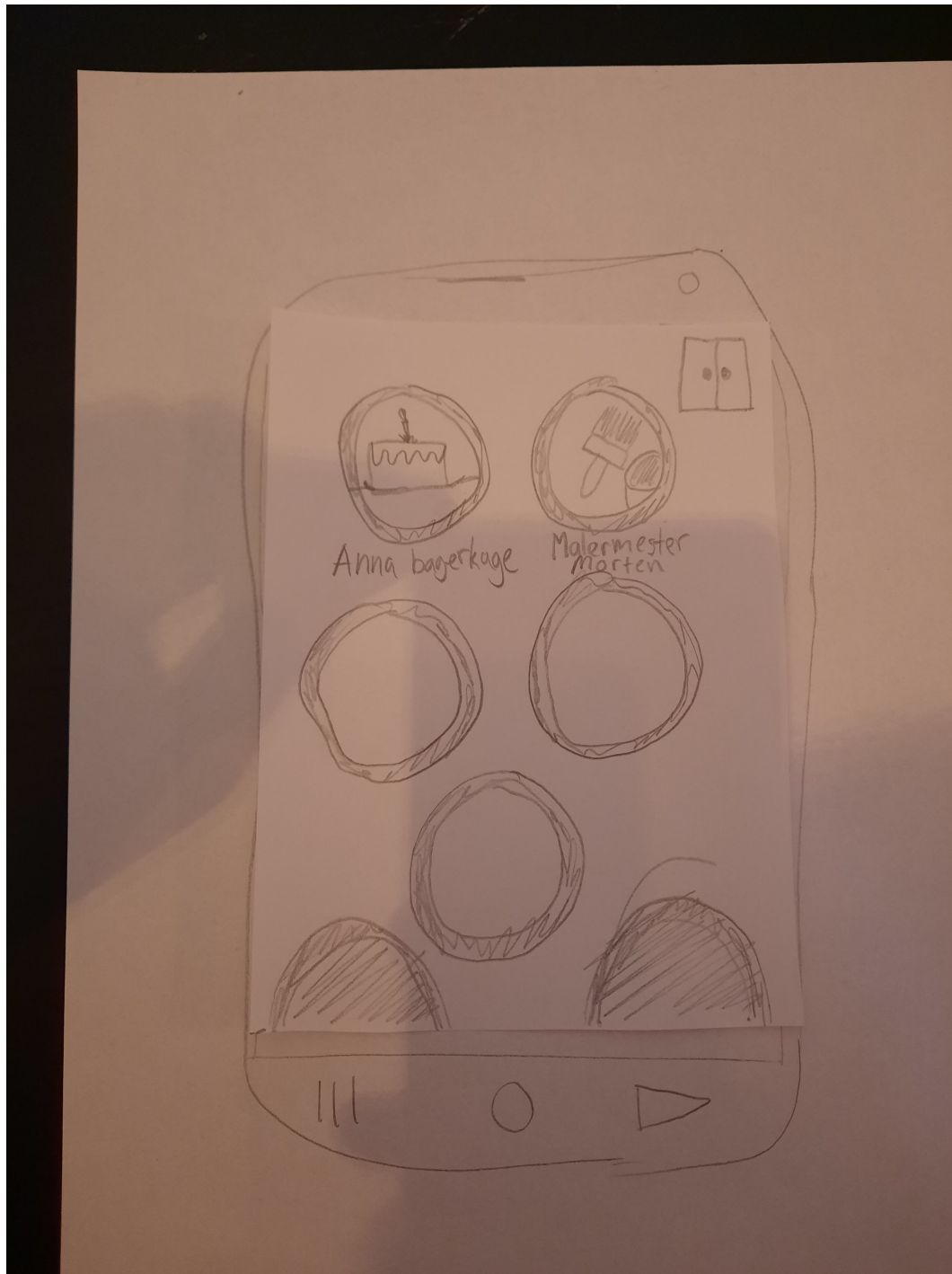
11

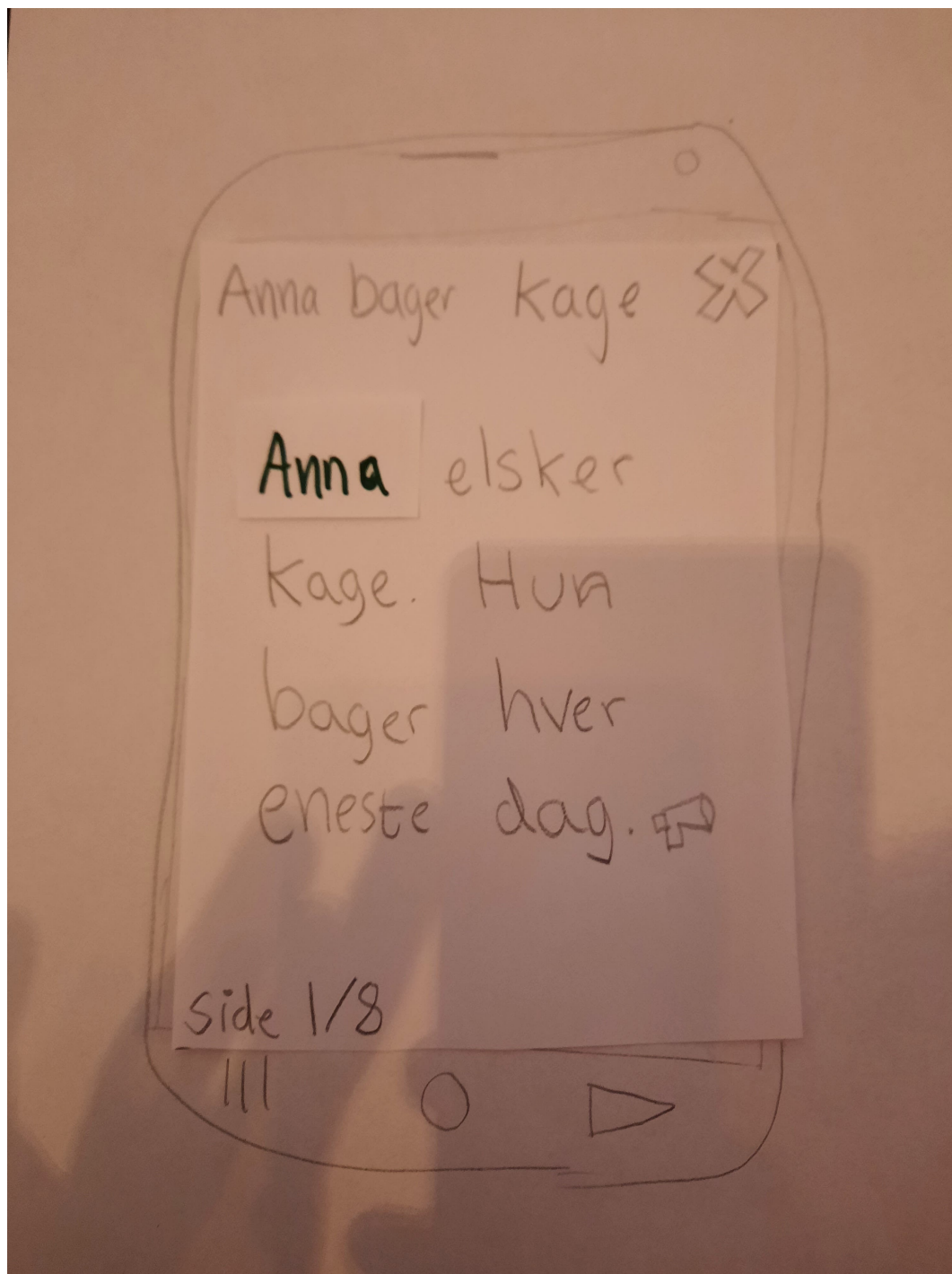Figure 8: Prototype: Læsebamsen Benny

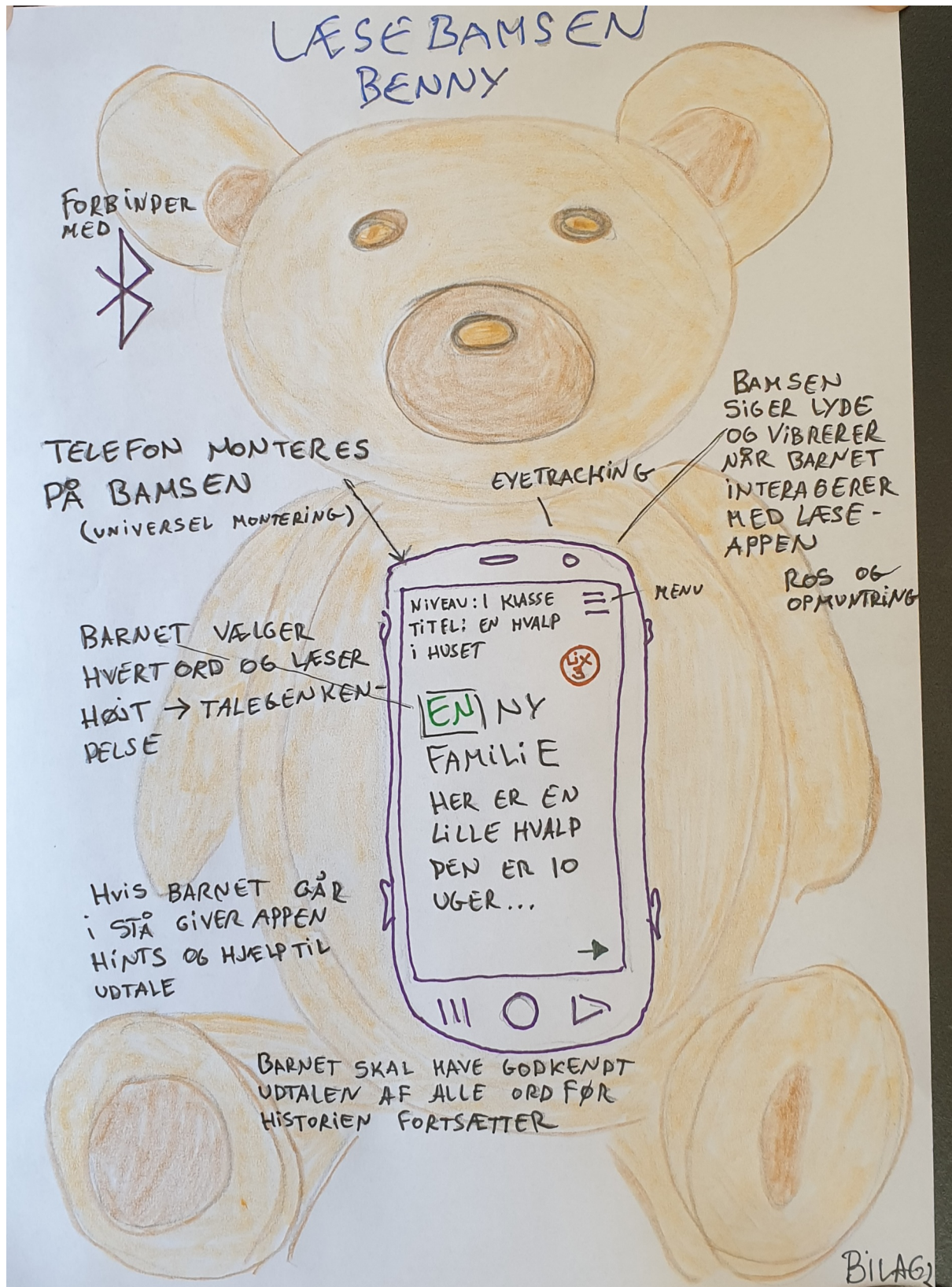Figure 9: Prototype: Læsebamsen Benny

Figure 10: Prototype: Læsebamsen Benny

Figure 11: Prototype: Læsebamsen Benny

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