IN5480 - Wonder document

Group 6

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Vibeke Johnson
Mari Cathrine Karlsen
Solveig Engevold Gaustad
Sigrid Linn

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About us

Our group consists of the following students: Vibeke Johnson, Mari Cathrine Karlsen, Solveig Engevold Gaustad and Sigrid Linn. We are all master students at UiO in the program Informatics: Design, use, and interaction. We have different educational backgrounds, where one completed the bachelor's degree at Hioa in Oslo, two at Kristiania University College, and one at the Norwegian University of Science in Gjøvik.

- Vibeke Johnson (vibej@uio.no)
- Mari Cathrine Karlsen (marick@uio.no)
- Solveig Engevold Gaustad (solveeg@uio.no)
- Sigrid Linn (sigrilin@uio.no)

Area of interest

We are interested in the area surrounding universal interaction between humans and chatbots. How do people with diverse cognitive disabilities, for example, blind, visually impaired, speech struggle, or dyslexia interact with chatbots? How they communicate, in what way they communicate, feedback and usability. Universal Design, HCI, and Human-AI interaction will be emphasized in this study.

> *«A chatbot provides textual means of communication, and may be more challenging for people with dyslexia, who will often avoid reading long texts and/or experience difficulties in understanding it. They often misspell words when they write text. Difficulties with decoding words and understanding text occurs in all forms of dyslexia» (Shaywitz & Shaywitz quoted by Lilleby, Marstein, and Verne 2021)*

Background

People with dyslexia often have additional symptoms such as reduced working memory, low concentration, reduced motor skills, and difficulties with sequencing *(Sandnes 2011, p. 192 quoted by Lilleby, Marstein, and Verne 2021).* This paper written by Lilleby, Marstein, and Verne shows us different examples of how people with dyslexia struggle to communicate

with a chatbot. For instance, users who experience trouble with spelling errors. On one hand, you have the human factors that cause difficulties like communication and understanding. On the other hand, you have AI technology that does not act like a human being. Chatbots can have problems with understanding spelling errors etc.

"Dyslexia is actually about information processing. Dyslexic people may have difficulty processing and remembering information they see and hear, which can affect learning and the acquisition of literacy skills." (*Lilleby, Marstein and Verne 2021).* People with dyslexia often seek personal help or a phone call service instead of talking to chatbots. Especially when the chatbot's answer is too long, like an explanation or instruction. On that note, we need to make sure that the communication between the user and the chatbot is optimized and easy to use.

We have to understand the issues and how we, as designers can increase the structure and elements of a chatbot.

In this project, we will use WCAG 2.1´s guidelines to focus on universal design (*Web Content Accessibility Guidelines (WCAG) 2.1*, no date).

Questions

1. How do language and pronunciation work together with chatbots to make sure universal design is in place? If a user with dyslexia chooses to use a chatbot, is it possible for this individual to feel understood and perform the task needed? Another aspect is when using speech services, will the AI take into account the variables of dialects and users with other native languages than the language programmed into the chatbot?

Methods

In our feedback from our peers, there was a wish for more clarity in the method part of our wonder document, we have worked more on this with module 2, and feel more comfortable with choosing and using these methods.

Due to the corona situation, it is difficult to predict how much physical contact we can have with the user group, our initial goal is to conduct initial interviews and test the usability at the end of the project. To make sure this is possible, our backup plan is to do these interviews digitally if needed. We will evaluate our methods during the project timeline.

In addition to this, we will use research articles and other relevant curricula to support our writing.

Method - Questionnaire

In this assignment, we have used a questionnaire as a method. After some discussion, we figured out that the best questionnaire to use is the one made by the University of Oslo (*Chatbot og dysleksi – Vis - Nettskjema*, no date). This web form takes into account the prospect that many of our users need to have the questions read out loud for them with TTS (TextToSpeech).

The reason for using a questionnaire as a method can provide more information about the chosen technology from future users. Similar to other methods, questionnaires have their limits. One imperfection is the use of a broad collection of data, instead of deep dive into one specific topic you want to explore. (uio.no, 2021)

As a start for the project, we have to identify the problem the users have. Understand and portray how it is like for a person with dyslexia to use a Chabot.

By using a questionnaire, we will have the possibility to collect data from several people in a relatively short time. The method of using questionnaires will allow us to obtain concrete and useful information, first and foremost if you have spent some time developing the questionnaire. We used closed questions to have the prospect decide which response format you want back. Therefore, it becomes easier to extract concrete information from those who are asked in the survey. Since the only personal information collected from the questionnaire is age, we have decided that it is not necessary to apply for the storage of personal data. We have made it clear to the participants that the data collected will only be used in our report.

We have sent the questionnaire by mail to the association Dyslexia Norway, and also shared the questionnaire on social media. The implementation of the survey will be most efficient if we collect answers from numerous users.

Method - Literature

To further increase our knowledge about dyslexia and chatbots, we have chosen to use literature as a method for collecting insight. By reading several articles on the subject, we have been able to get to know the subject and previous research on it.

The articles we have chosen to work with are these:

Article	Writers	URL
They often avoid text. Chatbot for young adults with dyslexia (Lilleby *et al.*, 2021)	Anton Lilleby, Steffen Marstein, and Guri Verne	https://www.researchgate.net/profile/Guri_Verne/publication/349038405_They_often_avoid_text_Chatbot_for_young_adults_with_dyslexia/links/601bfff1a6fdcc37a8000689/They-often-avoid-text-Chatbot-for-young-adults-with-dyslexia
Accessible conversational user interfaces: considerations for design (Lister *et al.*, 2020)	Kate Lister, Tim Coughlan, Francisco Iniesto, Nick Freear, and Peter Devine.	https://dl-acm-org.ezproxy.uio.no/doi/abs/10.1145/3371300.3383343
Android based educational Chatbot for visually impaired people (Kumar *et al.*, 2016)	M Naveen Kumar; P C Linga Chandar; A Venkatesh Prasad; K Sumangali	https://ieeexplore.ieee.org/abstract/document/7919664?casa_token=bOrBA5d7-yYAAAAAA:69juCdTL3OAo3cx8ShT4613zvn6sz9ml0RiFuX-NE3BRJa9aLF4k_HQyFwyeqyX0GLE3p078LEw

We will also be working with Web Content Accessibility Guidelines (*Web Content Accessibility Guidelines (WCAG) 2.1*, no date) to make sure our project is universally accessible. This will be valuable tools and guidelines for us in our work to make an accessible chatbot for everyone.

Findings

In this section, we will present the initial outcomes from the questionnaire that we created to see what research and data collection we could find on how dyslectic people experience chatbots.
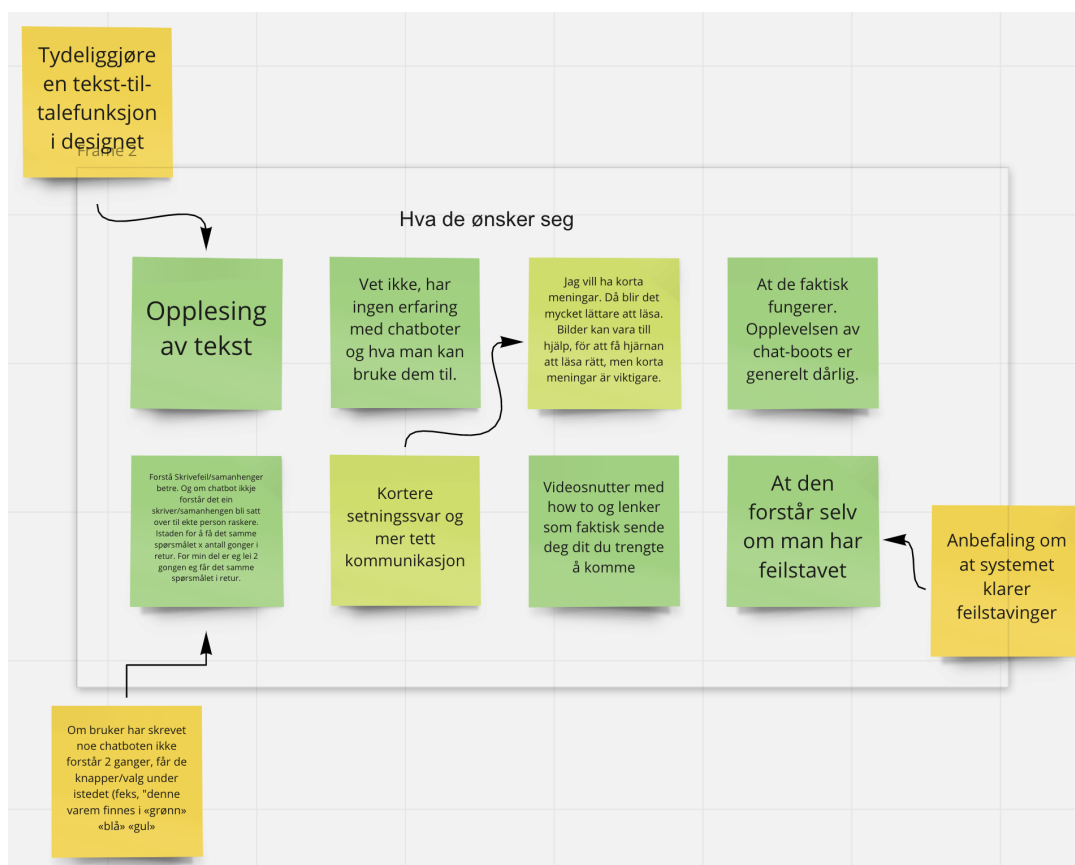
Hvorfor de ikke bruker chatboter

De er ofte for primitive og gir ikke de svarene jeg trenger

Frykten for å bli missforstått av chatbot som ikkje er tilpassa mitt språk og mine eventuelle skrive feil. Og at den henger seg opp å ikkje forstår kva eg skriv. Eg ser ikkje sjølv at det eg skriv er feil, blir som om den gjer narr av meg når den ikkje forstår det eg skriv. Så difor ungår eg dei så langt det går ann.

Er for gammeldags til å snakke med ring som ikke er levende. Men har heller ikke prøvd det i forbindelse med Dysleksi, så jeg vet ikke så mye om det.

The main aspects of why they choose not to use chatbots are mainly that they don't give them the response they are seeking. They fear being misunderstood, along with the frustration of making tiny mistakes in their spelling which result in the chatbot not being able to give a proper response.

Tydeliggjøre en tekst-til-talefunksjon i designet

Frame 2

Hva de ønsker seg

Opplesing av tekst

Vet ikke, har ingen erfaring med chatboter og hva man kan bruke dem til.

Jag vill ha korta meningar. Då blir det mycket lättare att läsa. Bilder kan vara till hjälp, för att få hjärnan att läsa rätt, men korta meningar är viktigare.

At de faktisk fungerer. Opplevelsen av chat-boots er generelt dårlig.

Forstå Skrivefeil/samanhenger betre. Og om chatbot ikkje forstår det ein skriver/samanhengen bli satt over til ekte person raskere. Istaden for å få det samme spørsmålet x antall gonger i retur. For min del er eg lei 2 gongen eg får det samme spørsmålet i retur.

Kortere setningssvar og mer tett kommunikasjon

Videosnutter med how to og lenker som faktisk sende deg dit du trengte å komme

At den forstår selv om man har feilstavet

Anbefaling om at systemet klarer feilstavinger

Om bruker har skrevet noe chatboten ikkje forstår 2 ganger, får de knapper/valg under istedet (feks, "denne varem finnes i «grønn» «blå» «gul»

What the user group wishes to experience in the future, is to have the text read out loud with shorter text and answers. In general they don't feel any efficient use with the chat bots. They express a wish that they were able to communicate and that the chatbot would understand their typos and be more comprehensible.

References

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