Reading Guide

Control of noise

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The Assignment

Problem

In 2023 a new law in The Netherlands states that students at primary school need to have at least 2 hours of physical education each week. As a result, physical exercise teachers have to be in the gym hall for a lot more. Physical exercise teachers already had a lot of problems related to tinnitus, hearing loss and other problems for being in a gym hall for too long. Due to this problem we received the following design challenge: How can physical exercise teachers in primary school get more insight into the sound levels and stress during the class?

Goal of the project

The primary objective of our project is to develop a solution that enhances the understanding of sound levels and stress for physical education (PE) teachers in primary schools. In collaboration with Sorama, our project partner, we aimed to provide valuable insights into sound and enable effective noise reduction. Sorama's mission revolves around improving sound awareness, and by visualizing sound, we can empower PE teachers to efficiently address and minimize unwanted noise in their classrooms.

Approach, Implementation and Results

How can the principles of human factors and ergonomics be integrated to create products and services that are usable, safe, and comfortable for a diverse range of users? To answer this question I used the literature study method. This literature study emphasized the significance of human factors and ergonomics in designing a user-centric and optimized product.

What insights are valuable to teachers? To answer this question I performed document analysis. The analysis of these documents provided valuable insights into the lack of awareness among teachers regarding the occupational health risks associated with noise pollution, emphasizing the need for our digital solution to raise awareness and enable monitoring and management of sound levels in PE classes.

What insights are valuable to teachers?
Are there any existing measures for noise control in primary schools? To answer those questions I conducted a User Interview with a primary school teacher. The interview provided valuable information as we learned that there are some existing measures for improving student concentration in primary schools which teachers already use. The participant's suggestion of using a smartwatch to measure sound levels in classrooms was a positive indication that the product we are designing has practical value and potential usability among real teachers.

[Define phase](#)

How can we visually represent our research findings and collected insights in a meaningful and impactful way? To answer this question I created a [user persona.](#) The development of this persona allowed us to gain valuable insights into the frustrations, goals, and preference of our target users, enabling us to design a customized digital solution that meets their specific needs.

How can valuable insights be presented to the end users? To answer this question I conducted [competitive analysis](#). This analysis provided valuable insights into the common design patterns used in existing sound measuring apps as well as inspiration for our app's design, especially in terms of color schemes and visualizing data.

How can we showcase our work to other teams within the project? To address this question I represented our group in a Mid-Term presentation. I created a presentation with my colleagues Wolfgang and Tanmay and presented our progress to other groups with Tanmay.

[Ideate phase](#)

What insights are valuable to teachers? To answer this question I conducted [a MoSCow analysis](#). This helped us to identify the screens we need to design for our app.

How can valuable gained insights be presented to the end users? To answer this question I created [user flow charts](#) using the Navigation Map method. This gave us a clear picture of how the users will interact with our app.

I also created a [UI Moodboard](#) using the MoodBoard CMD method. This moodboard provided me with clarity on how our app interface might look and also influenced our color palette choice for our design system in later stages. Lastly I created [sketches](#) using Sketching as primary and Ideation as secondary CMD methods. Those sketches helped my colleagues Oliver and Majid by giving them an inspiration to create their high-fidelity prototypes for the Dosage Timeline screen in our app. The sketches also influenced my low-fidelity and high-fidelity prototypes developed later.

Prototype phase

What medium is best to present the visual solutions for the end users?
How can valuable insights be presented to the end users?
To answer these research questions I used the Prototyping CMD method to create both [low-fidelity and high-fidelity prototypes](#) of the Settings section of our app. I did two 2 iterations by following common WearOS design guidelines and using older inspirations such as sketches created in the previous phase.

Test phase

What medium is best to present the visual solutions for the end users?
Here after finalizing our prototype I created my own questions and they were placed in the [usability test plan](#) which my colleague Tanmay created. Later on those questions were part of the usability test we created in Useberry.
After we gathered user feedback I analyzed the results and created a usability test report. This can be seen [here](#).

Software system design

How can we effectively visualize and communicate the architecture and components of our software system? To answer this question I created my individual [C1 diagram](#), [C2 diagram](#) , [C3 diagram](#) and [group C3 diagram](#).

Additionally I conducted research via the Literature Study method to identify existing software libraries which future teams can use. This can be also seen [here](#).

[Reflection](#)

I wrote my personal reflection using the Gibbs reflective cycle method. My full reflection can be found [here](#).

Proof of learning outcomes
Note: click on the underlined links if you want to see a specific proof

Learning outcome	Proof
User interaction (analysis & advice)	- Literature study - Document analysis - User interview - User flow diagram - Moscow analysis - Persona
User interaction (execution & validation)	- Competitive analysis - UI mood board - Moscow analysis - Persona - User flow diagram - Sketches - Prototypes - Usability testing - Usability testing analysis
Software Design	- C1 - C2 - C3 individual - C3 group - Software libraries research
Future oriented organization	- Project plan - Project Working Agreement - Team canvas
Investigative problem solving	- Project Plan - Literature study - Document analysis - User interview - Competitive analysis - Persona
Personal leadership	- Reflection - Project Working Agreement - Team canvas

Goal-oriented interaction	- Peer review - Stakeholder appreciation - Mid-term presentation - Noise Control Project Plan - Project Working Agreement - Team canvas