

Evaluation of Woof - A Tool For Developing a Prosperous School Class

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MASTER THESIS



Evaluation of Woof - A Tool For Developing a Prosperous School Class

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Abstract

In order to deal with the rising stress levels of pupils, it is important to create a well-functioning learning environment. This can for example be done with various tools, one of them being Woof Technologies ApS platform WOOF which can be used as an aid for teachers in elementary school to measure and work with students' well-being in class.

The purpose of this thesis is to analyze and evaluate Woof Technologies ApS platform WOOF from a usability perspective. Based on user-centered design, a heuristic evaluation was made on the existing program but also an exploratory investigation on the existing users of the program. Furthermore, through an iterative working method, two prototypes were created which underwent usability tests with observations and interviews. Based on the collected information, it was possible to compare the prototypes with each other and the existing program in order to draw conclusions about improvement opportunities to increase usability in the future, both short-term and long-term.

The result showed that in the short term the platform would need, for example, more visual feedback, consistent language throughout the program, that cancel and back buttons are added, but also that the possibility to be able to navigate to the menu wherever the user is in the program is created. In addition, to simplify usability, collect everything that has to do with the same thing, for example, users on the same page.

Long term, it is possible to add menu tabs in WOOF-space to divide the information, add a beginner's guide, but also information boxes that come up when you hover the mouse over, for example, buttons and icons. In addition, update the overview mode, adding a first page that shows all the graphs that exist to make it easier for the user to see the content.

Keywords: Usability, Prototype, Heuristic Evaluation, WOOF, Woof-space, User-centered design

Sammanfattning

För att kunna handskas med de stigande stressnivåerna hos skolelever är det viktigt att skapa en välfungerande lärandemiljö. Detta kan till exempel göras med olika verktyg och ett av dem är Woof Technologies ApS plattform WOOF som kan användas som ett hjälpmedel för lärare i grundskolan för att mäta och arbeta med elevers trivsel och välmående i en klass. Syftet med detta arbete är att analysera och utvärdera Woof Technologies ApS plattform WOOF ur ett användbarhetsperspektiv.

Med utgångspunkt i användar-centrerad design, gjordes det en heuristik utvärdering på det befintliga programmet men även en utforskande undersökning på de befintliga användarna av programmet. Vidare skapades, genom ett iterativt arbetssätt, två prototyper som genomgick användbarhetstester, observationer och intervjuer. Utifrån den insamlade informationen gick det att jämföra prototyperna med varandra och det befintliga programmet för att dra slutsatser om förbättringsmöjligheter för att öka användbarheten framöver, både kortsiktigt och långsiktigt.

Resultatet visade att på kort sikt skulle plattformen till exempel behöva mer visuell feedback, konsekvent språk genom hela programmet, att avbryt- och tillbakaknappar läggs till, men också att möjlighet för att kunna navigera till menyn var användaren än är i programmet skapas. Dessutom för att förenkla användbarheten, samla allt som har med samma sak att göra exempelvis användare på samma sida.

På lång sikt, kan man lägga till meny-flikar i WOOF-space för att dela upp informationen, lägga till en nybörjar-guide, men även informationsrutor som kommer upp när man håller över med musen på exempelvis, knappar och ikoner. Dessutom uppdatera översikts-läget, lägga till en första sida som visar alla grafer som existerar för att göra det lättare för användaren att se innehållet.

Nyckelord: Användbarhet, Prototyp, Heuristisk Utvärdering, WOOF, WOOF-space, Användar-centrerad Design

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List of Definitions

CD - Conceptual Design

Hi-Fi - High Fidelity

ID - Iterative Design

Lo-Fi - Low Fidelity

PBS - Product Breakdown Structure

SUS - System Usability Scale

UCD - User Centered Design

UX - User Experience

WOOF - Is a functions to gather information from the students. To start the information gathering, the user needs to click on WOOF that is referred as a dog's paw in the program

Woof-space - The page of a class where their information gathering is summarized

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Chapter 1

Introduction

This section presents the background, the purpose and the research questions for the entire master's thesis. Limitations and scope will also be represented in this section as well as related work for this project.

1.1 Background

Today, the pressure of getting good grades and perform in schools is contributing to students stress levels increasing [6]. To be able to perform in school it is crucial to have a functioning learning environment, something that Skolverket describes as this:

"A safe learning environment is about children enjoying themselves at preschool and students at school. It is also about children and students having a sense of context and being given the conditions to participate in the educational activities or in the teaching. An example of adaptations in the learning environment is structure and clarity, follow-ups and feedback." [26]

However, according to the Swedish Schools Inspectorate, the feeling of safety have decreased during the time period between 2010 and 2020 [25]. Continuing, Schools Inspectorate's regular supervision of a group of chosen schools shows the that the most common shortcomings the last couple of years are to provide preventive and health-promoting work of student health, followed by the school's work with safety and study tranquility [22, 23, 24].

Considering the mentioned flaws in Swedish schools there are room for measures to be taken to continually work towards a better learning environment, something Woof Technologies ApS want to explore by providing a *Software as a*

Service (SaaS)-platform for schools that want to use a new type of tool to incorporate fellowship practises in the classroom. Furthermore, the platform allows teachers to gather data and track a class's well being as well as provide exercises to improve the feeling of community. Currently, Woof Technologies ApS provides this tool for several schools and school classes in Denmark and the company's innovation is now relevant to be tested in Swedish classrooms.

1.1.1 Woof Technologies ApS

Woof Technologies ApS is a Copenhagen based start-up company that was founded in 2018 and launched their current application commercially in 2021. Today they have a total of eight employees working on developing, expanding and marketing their services. Woof Technologies offers an application to measure and work with students well being in school classes from 1st grade until 10th grade in Denmark. As of right now, there are currently 623 schools in Denmark using Woof Technologies platform and the company is ready to continue to distribute its application to parts of northern Europe, one country being Sweden.

Woof Technologies provides a platform where students anonymously with their own devices answer some questions about how they feel, what's been positive and negative since last time, and what they like or dislike. This action is called to "WOOF" and is an activity to gather data on the overall mood or well being of the class. The class can then discuss the results together since it's summarised in their "woof-space" dedicated to that specific class. The woof-space is usually projected on a big screen in the classroom and contains additional functionality such as lists of rules or values decided by the class, courses on development, and different graphs showing trends based on the previous woofs.

Today, there are a few other similar mood monitoring applications. Examples of these are YouHue [28] or SAAS Schools Moodtracker [21] which provides the teacher with an insight of how the pupils are feeling. However, these applications does not seem to provide anonymity for the children which Woof Technologies platform does, which sets them apart.

1.2 Purpose and Research Questions

This project aims to evaluate the dashboard of a tool used to increase the well being of classes from third to ninth grade in Swedish schools. Additionally, the goal is also to suggest improvements possible for further integration in Sweden regarding user experience. This will be done by producing and testing prototypes and answering following research questions:

- How well does the existing design of the application perform based on a heuristic evaluation and what differences should be made to improve the user experience?
- By comparing it with new developed design, what could be done both short term and long term to improve the existing application's usability?

1.3 Sustainability work

The Sustainable Development Goals (SDG) are the United Nations (UN) call to action to eradicate poverty, safeguard the environment, and enhance the lives and futures of all people by 2030. [16] Woolf Technologies incorporate and work according to the SDG's and out of the SDG's 17 goals, this project aims to contribute to goals number three and four presented below:

Good health and well being (Figure 1.1): *"Ensuring healthy lives and promoting well-being at all ages is essential to sustainable development."* [16]

Quality Education (Figure 1.2): *"Providing quality education for all is fundamental to creating a peaceful and prosperous world. Education gives people the knowledge and skills they need to stay healthy, get jobs and foster tolerance."* [16]



Figure 1.1: Goal 3



Figure 1.2: Goal 4

By developing and refining a tool to improve the well-being of students, we hope with this thesis to contribute to better mental health amongst children and to create conditions for the best learning environment possible.

1.4 Related work

Previous research has shown that gamification can enhance user experience design (UXD) by increasing user engagement and motivation. Studies have explored the effectiveness of gamification in various contexts, such as education, healthcare, and business. Researchers have also investigated the design elements that contribute to successful gamification, including rewards, feedback, competition, and social interaction. However, there is still a need for more research on the long-term effects of gamification and the potential drawbacks, such as addiction and exploitation. Additionally, researchers have called for a more critical approach to gamification, emphasizing the importance of ethical considerations and user-centered design principles [14].

Another article discussing gamification and its benefits is *Effective Usage of Gamification Techniques to Boost Student Engagement* where Raju et al. [19] explores the benefits of using gamification to enhance student engagement with one of the mentioned tool being Mentimeter. Mentimeter is a digital platform that

allows real-time audience engagement by offering various features such as polls, word clouds and quizzes. This platform is not the same but has similarities to the WOOF platform being evaluated in this master thesis. Raju et al. [19] suggests that Mentimeter can be effectively used in educational settings and can enhance the student engagement and foster a positive learning experience.

1.5 Limitations and scope

The time limitations for this project is 20 weeks, within this time, the three Low Fidelity and the High Fidelity prototypes are to be tested and evaluated and in addition, information are collected for the master's thesis. When it comes to the scope the evaluation and focus will be on the release we got access to at the beginning of the work process. The updates in the program that were made after will not be taken into account during the process.

1.6 Distribution of Work

During the writing process, the work was distributed equivalently. Commonly we gathered information and then discussed everything together as a team. On the contrary, the prototyping phase we decided to distribute the work equivalently between us. We developed three Low Fidelity Prototyping each to streamline the process. Then, when designing and developing the High Fidelity Prototyping we performed it as a team together. Finally, at the test phase with our participants, we had different rolls to collect as much feedback as possible.

Chapter 2

Theoretical background

This chapter presents the theoretical background for this thesis. This includes information about interaction design, different designing processes and prototyping, furthermore, different testing methods.

2.1 Interaction Design

When it comes to design, there are always good and bad design solutions. A product can have good design but that does not necessarily mean that the design solution is good. The design of a product or service has a great impact on the user experience for the end user. With a good and thoughtful design it can improve the user experience but also improve the use of the service [18].

To begin with, defining the concept of interaction design as a type of design process that focuses on understanding the user's needs and creating products and services that meet these needs and requirements. Interaction design is an iterative process which will be explained in more detail further down, it requires that multiple prototypes are made in order to test and improve the design. An important thing is also that it requires that during the design process the user's experience, user-centered design and testing are taken into account to ensure that the product or service meets the user's needs [8].

2.2 User Experience

Interaction design places a lot of emphasis on the User Experience (UX). According to the International Organization for Standardization (ISO), UX is defined as:

"user's perceptions and responses that result from the use and/or anticipated use of a system, product or service" [7]

This means that the UX is based on the overall feeling of satisfaction the product/service/company gives the user when interacting with it [18].

2.3 Usability

Usability is used in interactive products and has to do with user experience. When a product is developed the concept focuses on how easy the user interaction is, if it is easy to learn the functionality, moreover, how effective the product is for the user [2, 18]. Usability has an ISO definition which is:

"Usability is a scalable, task-based measure of the degree to which users are enabled to achieve goals effectively, efficiently and with satisfaction, taking account of the context of use." [5]

In other words, usability reaches certain requirements during product development, this to improve the experience for the user.

2.4 User-Centered Design

User-centered design (UCD) is an approach to design that prioritizes the needs and preferences of users. It involves understanding user behaviors, goals, and tasks, and using this information in the design process [1]. UCD is particularly relevant in fields where the user experience is critical, such as software design, product design, and service design.

Moving on, UCD typically involves conducting research through methods such as interviews, surveys, and usability testing, to gain insights into users needs and preferences. The goal of UCD is to create products or services that are usable, useful, and enjoyable for the intended users. This approach can lead to better user satisfaction, increased user engagement, and safer products. Additionally, UCD is an iterative process that involves continuous testing and refinement to ensure that the final product meets the users needs [1].

2.5 Design process

To create new products, it is beneficial to work from a design process to get a structured process. It can consist of various steps, understanding the user needs and problems, research and analysis, prototyping and testing of the product, and finally implementation and improvement. For this to be done properly, it is important to keep the user in mind and communicate actively with the user throughout the design process [15].

2.5.1 Brainstorm

When ideas need to be developed and generated, a brainstorming session can be made. When a group of individuals share opinions, discuss, and reflect on different issues, the group can share their ideas with each other and easily come up with new ideas. The purpose of such a session is to find new and innovative solutions to solve various problems. By performing such a session, it contributes to getting feedback from others as well as sharing their own thoughts. It also helps the team to start thinking outside of their comfort zones [13].

2.5.2 Product breakdown structure

Product Breakdown Structure (PBS) is a technique used to break down a product concept or system into a hierarchical diagram. The technique breaks down the program or system into smaller parts showing all the components of the product. This is to understand and plan the product development process. It can help developers to organize the components of the product and create an easily navigable overall structure which makes it easier to understand and see the big picture. It can also help to identify any potential issues that may arise, as well as help to distribute tasks and monitor the development project. PBS is useful for understanding the composition and structure of the product, and can be used to help plan product development [4].

2.5.3 Affinity Diagram

To organize and summarize large groups of ideas, data, and information, one can use a tool called an Affinity Diagram. It helps to organize and group information and ideas to understand and keep track of it all. The tool is useful for finding various connections between different ideas, it helps to improve creative problem solving but it also helps to identify alternative solutions [12].

2.5.4 Iterative Design

The concept of Iterative Design can be explained as a design process, this process aims to improve the quality of a product or service, this by repeating a sequence of steps. There are five different steps that are carried out in the design process, planning, design, building, testing and analysis. These different steps are repeated in cycles until the product or service has met all the requirements set [18]. It is common to use iterative design to improve the quality of products and services, but also to achieve better results. It can help design teams to improve products or services by making small steps that together can create a big change in the design of the product or service.

2.5.5 Four Approaches within Interaction Design

Preece et al. [18] emphasises that there are generally four main activities within interaction design; *Establishing requirements*, *Designing alternatives*, *Creating prototypes* and *Evaluating*. These four approaches form a cyclical process that involves continuous iteration and refinement of the design until the final product meets the requirements and goals of the project. The relations between these approaches is shown in figure 2.1.

1. **Establishing Requirements** is a fundamental step in order to promote UCD. Through collecting and analysing data of the intended user's needs it is possible to set requirements that will create the foundation of the product design and further development [18].
2. **Designing Alternatives** is about generating a range of alternative design solutions that meet the requirements identified in the previous stage. This is an exploratory stage where designers generate ideas and concepts that may vary in terms of aesthetics, functionality, and usability. Additionally, this activity involves constructing both the conceptual and physical design, meaning what the user can do with the product respectively how the product should look [18].
3. **Creating Prototypes** is the stage where you make your design interactive with techniques ranging from prototyping in paper-form to a digital prototyping tool [18]. Ultimately, the goal is to create a tangible representation of the design that can be tested and evaluated by the target audience.
4. **Evaluating** is a very important step within interaction design where the products usability is measured against the set requirements. Furthermore, the objective is to identify any usability issues, get feedback on the design alternatives, and make iterative improvements to the design based on the evaluation results [18].

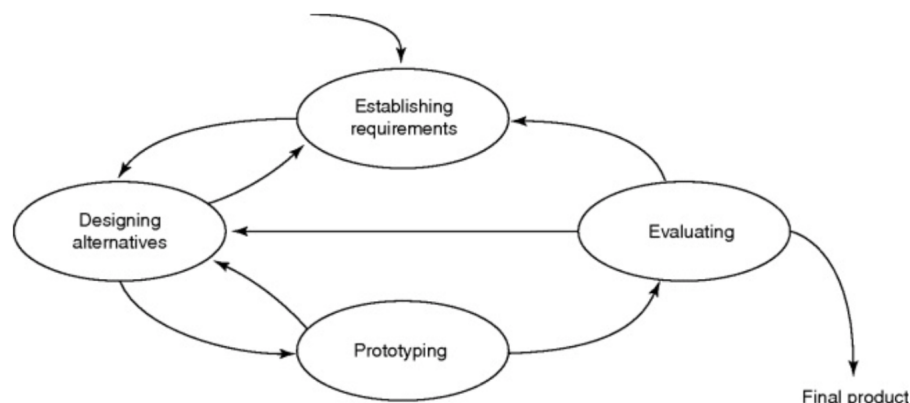


Figure 2.1: Preece model of the design process [18]

2.6 Conceptual Design

In interaction design it talks about conceptual design. A conceptual design is about to establish requirements to a conceptual model. An overall picture of what the user can do with the product but also concepts of what is needed to be able to interact with the product. In this case who is the user, which interaction type will be used, and what is the goal with the product [18]. This can be made by analyzing data from the user and imagining yourself in the user's experience. From this determined difficulties that will exist for the user. When this is done, the prototyping starts.

2.7 Prototyping

It is important to choose the best prototyping attribute that allows you to get the data required to improve the usability of the program or the website. Usually in the development phase a prototype is created from a design proposal. This is made for conditions of properties and functionalities that can be used in the product or program. It can be made very general but also more complex in detail. For example the prototype can be a scale model of a product, a program that crashes every 10 minutes, a sketch of a screen picture as well as a whole model of a workstation [18, 27, 9].

It is useful to create a prototype in the designing process in order to gather the design ideas. This is because the working group can discuss and communicate around the design and the functionality. It can lead to a reflection of the designing choices that have been made independent of how complex the prototype is [18].

It is usable to use the prototype for different user tests to gather more information and feedback of what the users are thinking about the design and the functionality. Based on the feedback from the tests, changes can be made for a better version of the final prototype before the development of the product starts [18].

2.7.1 Low Fidelity Prototyping

The first phase of the prototyping is to create a Low Fidelity (lo-fi) prototype. The lo-fi prototype is a simple prototype and is necessarily not similar to the final product. To get an overall picture of how users will use the program or website it is most useful to use a lo-fi prototype [27]. The functionality does not need to be included or be able to be used in the lo-fi prototype. Usually the lo-fi prototype is not done in detail or complicated, instead the prototyping is made as a general and simple representation of the final product. The material may vary, it can be made for example by paper, plastic, metal, or it can just be sketches[18].

The advantage of prototyping is that it is most often simple, cheap and quickly made. Considering this, it is simple to make changes on the lo-fi prototype in an early stage of the designing process. Besides this, it is useful because

more lo-fi prototypes can be made with different design proposals which can be compared. This is usable in a conceptual design, early in a prototyping have different proposals and explore ideas[18].

Lo-fi prototypes are not intended to be used as a final product, it is intended to help the developers to arrive at different proposals and changes to a better design [18]. When the lo-fi prototype is done the High Fidelity prototyping can be started.

2.7.2 High Fidelity Prototyping

Unlike the lo-fi prototype the materials that are used to create the High Fidelity (Hi-Fi) prototype are material that can be used at the final product. The focus lies more on the functionality and the interaction with the user. Developing a high fidelity prototype gets the most usability related data, it tests interactivity, navigation and the user experience. Hi-fi prototype takes more time, is more expensive and more difficult to create [18, 27].

The advantage with the hi-fi prototype is that the user actually tests a prototype which is very similar to the final product. Unlike the lo-fi prototype, the user can imagine how the final product actually will function and how to interact with the product. It is easier to get sensible feedback from the user when tests on hi-fi prototypes are made [18].

2.8 Investigation Techniques

In the following sections, different types of data gathering techniques are described. These methods were used to gather data in order to perform an evaluation.

2.8.1 Heuristic Evaluation

One approach to assess the interaction design of a product is by conducting a heuristic evaluation, which typically involves an expert, either within the design team or an external expert, evaluating the user interface from the perspective of a potential end-user to identify issues that actual users may encounter [18].

Jakob Nielsen has developed ten principles that can be used as rules of thumb when assessing interaction design. Overall, Nielsen's heuristics provide a valuable framework for evaluating the usability of software and digital products, and can help designers and developers create more user-friendly products that meet the needs of their intended users[18]. However, these principles should not be applied strictly but is intended, as mentioned, to be seen as guidelines [17].

Nielsen phrases these ten principles as follows [17]:

1. **Visibility of system status:** The design should always keep users informed about what is going on, through appropriate feedback within a reasonable amount of time.

2. **Match between system and the real world:** The design should speak the users' language. Use words, phrases, and concepts familiar to the user, rather than internal jargon. Follow real-world conventions, making information appear in a natural and logical order.
3. **User control and freedom:** Users often perform actions by mistake. They need a clearly marked "emergency exit" to leave the unwanted action without having to go through an extended process.
4. **Consistency and standards:** Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform and industry conventions.
5. **Error prevention:** Good error messages are important, but the best designs carefully prevent problems from occurring in the first place. Either eliminate error-prone conditions, or check for them and present users with a confirmation option before they commit to the action.
6. **Recognition rather than recall:** Minimize the user's memory load by making elements, actions, and options visible. The user should not have to remember information from one part of the interface to another. Information required to use the design (e.g. field labels or menu items) should be visible or easily retrievable when needed.
7. **Flexibility and efficiency of use:** Shortcuts — hidden from novice users — may speed up the interaction for the expert user so that the design can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.
8. **Aesthetic and minimalist design:** Interfaces should not contain information that is irrelevant or rarely needed. Every extra unit of information in an interface competes with the relevant units of information and diminishes their relative visibility.
9. **Help users recognize, diagnose, and recover from errors:** Error messages should be expressed in plain language (no error codes), precisely indicate the problem, and constructively suggest a solution.
10. **Help and documentation:** It's best if the system doesn't need any additional explanation. However, it may be necessary to provide documentation to help users understand how to complete their tasks.

2.8.2 Qualitative and Quantitative data

Quantitative data is data that is structured and statistical and can be compiled into numbers. Examples of quantitative data can be the participants age or how many times a specific product is used. In contrast to quantitative data, qualitative data is data that is describing more so than measuring. This type of data can be quotes from interview or open answers in surveys as well as documented behavior from an observation [18].

Hence, it is possible to gather both types of data from the most used data collection methods, surveys, observation and interviews.

2.8.3 Think Aloud

A technique used frequently while conducting usability testing is the Think Aloud-method. The method means that during the test, participants are urged to comment frequently and to justify their choices and motives [20]. This method is a great way to follow the thought process of the test participant and notice when and where possible confusion, frustration or satisfaction arises.

In addition, thinking aloud can contribute to test participants concentrate and focus better, however, other participants may need to be reminded and encouraged to use the technique since it, for some, can feel unnatural to verbalise their actions [20].

2.8.4 Questionnaire

A questionnaire or survey is a research method used to gather data by asking a set of questions to a larger group of people. Questionnaires can be designed to collect both qualitative and quantitative data by asking both open and closed questions. Additionally, questionnaires can be formed in many different ways, for example, with specific types of responses, such as yes/no answers, rating scales, or free-form text [18]. The most commonly used rating scale is the Likert scale which can be used to measure user satisfactory such as opinions and attitudes. Options for answering can be an interval of numbers, often ranging from 1-5, or words ranging from strongly agree to strongly disagree [10].

Questionnaires can be an effective research tool because they allow researchers to collect data from a large number of individuals fast. However, questionnaires can also have limitations, such as low response rates and limited scope for follow-up questions or probing for clarification.

The System Usability Scale (SUS) was developed by John Brooke in 1986 and is a questionnaire for evaluating system usability. The SUS consists of 10 statements that are rated on a 5-point Likert scale, ranging from strongly agree to strongly disagree. Further, the items are designed to measure the usability of a system in terms of its effectiveness, efficiency, and user satisfaction. Generally, the SUS is answered after the interaction with the tested system has taken place and results in a total score representing the usability [3]. This score ranges between 0-100 where 68 is considered to be average and 80 above average [11].

2.8.5 Observation

When testing prototypes, observation can be a useful method to gather data. There are several scenarios in which an observation can be conducted, one being in a controlled environment generating both quantitative and qualitative data. With this method it is possible to observe details of the users actions as well as keeping the test person focused on the task with no interruption or disturbances [18].

2.8.6 Semi-structured Interview

A semi-structured interview is a research technique that entails conducting an interview with a predetermined set of open-ended questions. This type of interview allows for flexibility and adaptation since the interviewer can ask follow-up questions for further information or clarification based on the interviewee's responses. Hence, semi-structured interviews offer opportunities for in-depth exploration of topics and perspectives [18].

Chapter 3

Planning Phase

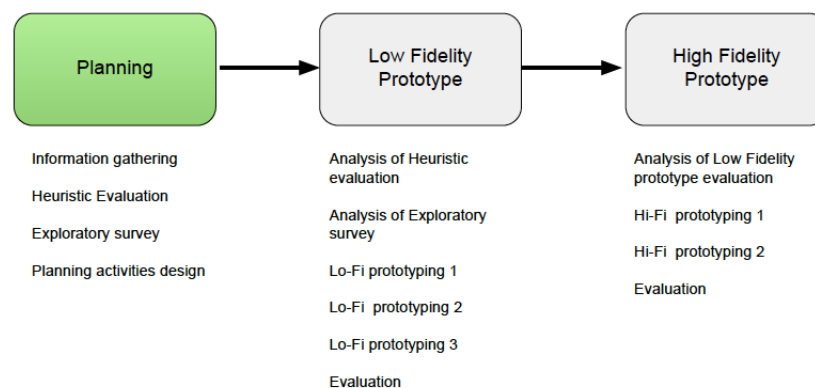


Figure 3.1: The work process illustrated in the different phases, shows Planning as current phase.

When setting up the project it was decided to divide the work into three different phases, Planning, Lo-Fi prototype and Hi-Fi prototype, with corresponding activities. The phases are illustrated in figure 3.1. This chapter will present the planning phase with activities such as information gathering, heuristic evaluation, exploratory survey and activities for planning the design.

3.1 Information gathering

In the beginning of the planning phase information gathering was in focus. It was important to understand the purpose and get to know the program and its functions well. While getting to know the program the opportunity to see the

program as a first time user was seized and the experience reinforced the importance of UCD which would follow throughout the project.

The activities performed to get to know the program and find opportunities of improvement was describing the current system provided, performing a heuristic evaluation as well as sending an exploratory survey to existing users.

3.1.1 Current System

This section will present information about how the current system provided for this thesis works which is described in text and complimentary screenshots. The system evaluated consist of a Start page, the Woof-space and the insight. Furthermore, the target audience and users are mainly teachers which are the ones navigating through the platform.

Start page

The start page is seen in figure 3.2. On this page the user can extend a menu with paths back to the start page, the premium version of WOOF (Unicorn) with all its functions, support with FAQ and video guides and lastly to log out. Further, on the start page the user can create new classes by pressing the card with the blue plus sign. As seen in figure 3.3 the user can fill in a nickname, the grade and a name for the class when creating it. It is only the name that absolutely have to be filled out in order to save the class.

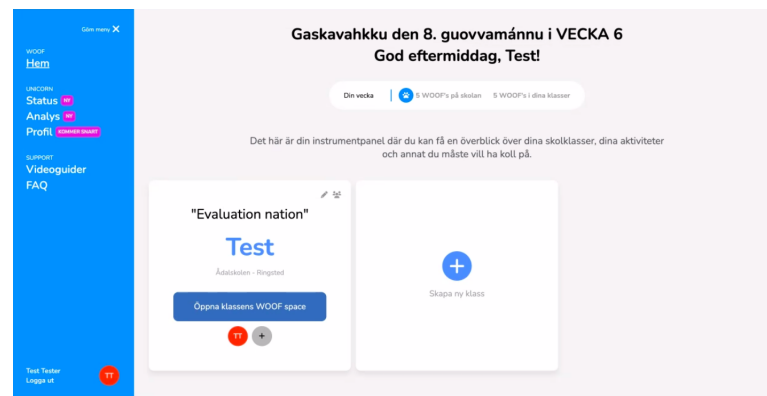


Figure 3.2: This figure show the start screen for the platform when the user is logged in, in this picture the menu is extended.

It is also possible to edit an already existing class by pressing the grey pen in the upper right corner of one of the class-cards. This feature is shown in figure 3.4.

Continuing, for every class the user can also invite other teachers to have access to the class's Woof-space. This is done by pressing the grey plus sign on the chosen class-card and, as seen in figure 3.5, this is done by entering the email of the person to be invited.

By pressing the grey persons in the upper right corner of a class-card the user can get an overview of the users with access to the class. This overview is shown

Figure 3.3: This figure show the screen when the user wants to add an new class.

Figure 3.4: This figure shows when the user wants to edit an already existing class.

Figure 3.5: This figure show how it look like when the user wants to invite a user to a specific class. In the box the user needs to fill in the email they want to invite.

in figure 3.6 and this shows the users, what class they have access to, what school the class is connected to and what role the user is assigned (admin or teacher).

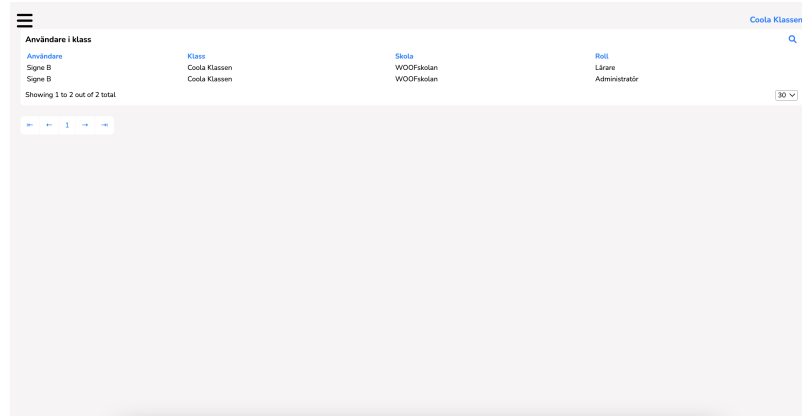


Figure 3.6: This figure show the users that exist for some specific class. It also shows which role the user has.

Lastly by pressing the blue button one of the class-cards the system redirects you to the class Woof-space.

WOOF-space

When a class is first created the Woof-space of the created class is restricted. As seen in figure 3.7, many of the features are locked until the user has WOOFed three times. By pressing the blue circle with a paw a WOOF is performed which means that a QR code appears on the screen and when scanned by the students own devices questions for them to answer will appear on their screens. When all the students answered a summary of the result is shown. When the class has WOOFed three times, the features open up which is shown i figure 3.8.

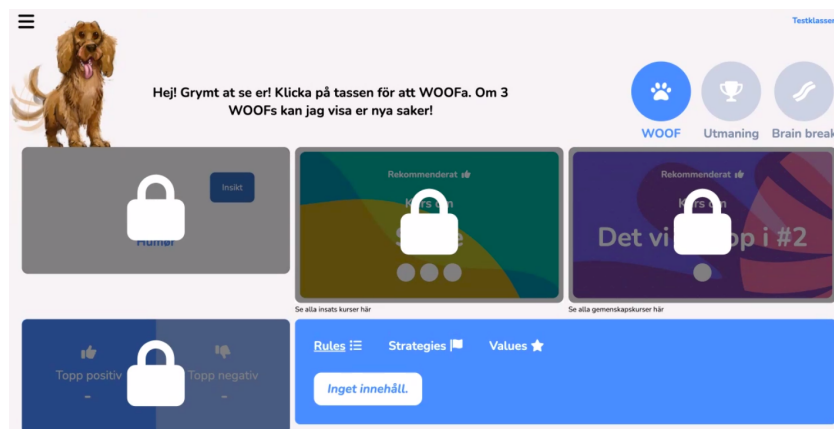


Figure 3.7: The figure show the WOOF space for a specific class, without some data.

In the Woof-space it is possible to take different courses together in the classroom.

Another feature of the Woof-space is a card where the class can fill in the class's rules, strategies and values. The respective category has a separate tab

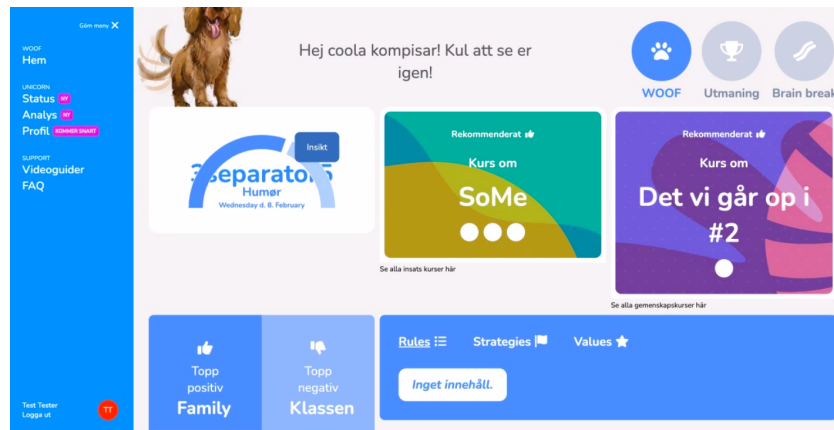


Figure 3.8: The figure show the WOOF space for a specific class, with some data.

which the user can alternate between. This card is shown in the right lower corner in figure 3.8.

There are two grey buttons next to the WOOF button called "Utmaning" and "Brain break" which are not implemented for the user to interact with yet.

Lastly, there are two additional cards with some of the information gathered at the latest WOOF. One presenting what the students found the most positive and the most negative. The other shows what average mood the class had on a scale.

Insight

Moving on, by pressing the blue button called "Insikt" next to the scale showing the class's mood, seen in figure 3.8, the user navigates to a graph showing the the average mood based on the latest WOOFs. This graph is shown in figure 3.9. From here, the user can navigate to two additional graphs by pressing the grey dots below the graph, these graphs are seen in figure 3.10 and 3.11.

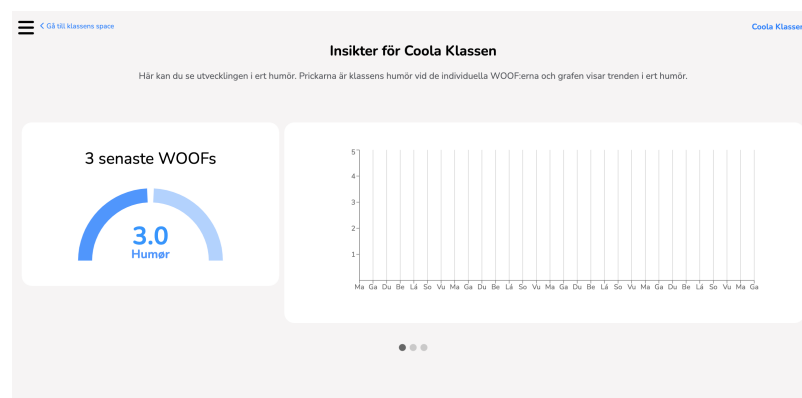


Figure 3.9: Shows the first graph, that represent the average mood latest WOOFs.

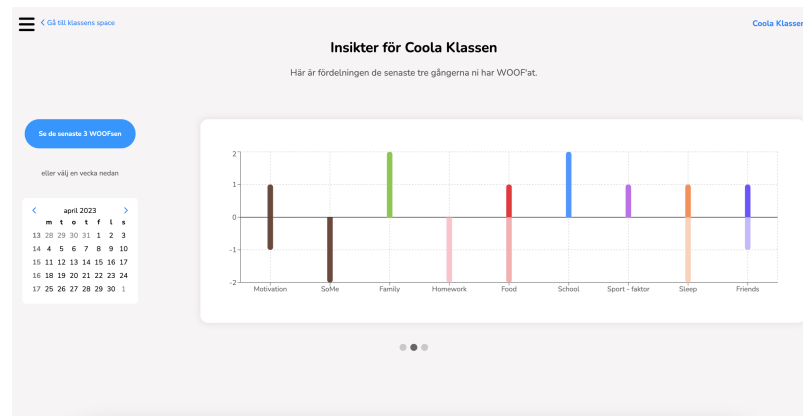


Figure 3.10: Shows the second graph, that represent positive and negative information of all categories. The user can use the default option (blue button) that present the three latest WOOFs, or choose a specific week in the calendar.

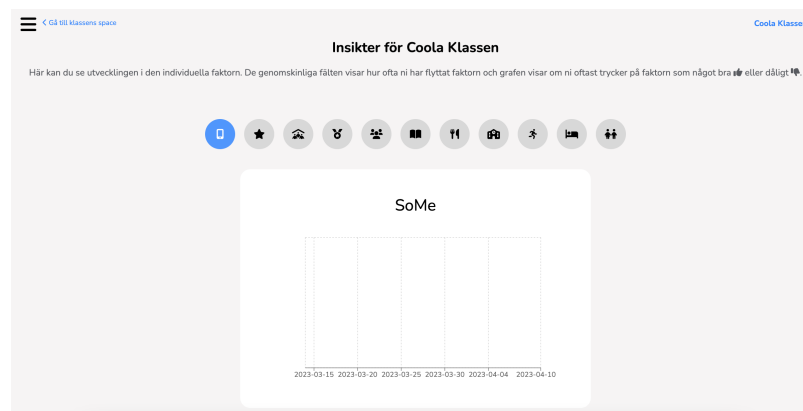


Figure 3.11: Shows the third graph, that present the trend of a specific category.

3.1.2 Heuristic Evaluation

To deepen the knowledge about the program, a heuristic evaluation was made by the design team. This was made to get an overview of the difficulties that existed, what functionality that was missing and what worked really well. The heuristic evaluation was done by discussing and navigate together within the program.

Below the findings for each principle are presented which are also represented in table 3.1:

1. Visibility of system status

When it comes to visibility of system status, the user is relatively informed about what is going on through appropriate feedback within a reasonable amount of time. For example, when the user creates a new class, the new class card is immediately shown on the screen. It is possible to amplify the feedback, so the user are updated and informed more and no ambiguities happens. While there is a

feedback message, it is placed where its hard to see for the user. There are some features that does not provide any information at all, for example, when pressing the two buttons for "Brainbreak" and "Utmaning" nothing happens, there is no feedback to why this is or if the user needs to fulfill any tasks for it to open.

2. Match between system and the real world

Based on the translated program from which the work was based on, match between the system and the real world was not logical. The language was not consistent, parts of the language was in Swedish, Danish, Latin and English. This could be that the translation was not correct or completely done from the company's side when the program became available. However, different words and concepts did not match the real world. Some abbreviations such as "SoMe" which would mean "social media", can be difficult for Swedish users to understand because the term is not used in the society, therefore does not make sense to the user.

3. User control and freedom

If the user accidentally selects a system function, there is no emergency exit. For example, when accidentally pressing "create class" the only way to exit this function is through the menu which is not very convenient. This is a problem throughout the program for several of the functions. Additionally, there is not the possibility to delete a class created or an invited user.

4. Consistency and standards

The program follows a consistent standard when it comes to words and meanings. However, given that the language is not consistent, it becomes a bit problematic.

5. Error prevention

Since there is not functions where actions made are permanent the error prevention is as extensive as it could be. However, there are one button for inviting a user and one for seeing the list of users it might confuse the first time user.

6. Recognition rather than recall

Looking at recognition rather than recall in the system, the user generally does not need to remember things when navigate in the application. However, on the first page there is a button that says "Open the class's WOOF space" once you are inside the class's "WOOF space" it does not say anywhere that you are inside the Woof space. This could lead to confusion for the user, whether one is inside the Woof space or not. Besides that, the system is visible and quite easy.

7. Flexibility and efficiency of use

The flexibility and efficiency of use have potential to be improved. When at a different page than the start page the user have to use the menu to go back. There are no other buttons to navigate back to the start page which might make the program less efficient for some users. On some pages there is one shortcut which leads to the class's Woof-space, however, this shortcut does not always makes sense in terms of when its needed.

8. Aesthetic and minimalist design

In the current system there is no irrelevant information. However, some of the information are placed very small or in strange places at the page which can make it hard for the user to see the information.

9. Help users recognise, diagnose, and recover from errors

In terms of helping the user recognise, diagnose and recover from errors, there is potential for improvement. For example, when not filling in mandatory test boxes an error message appears, however, this feedback is placed in the top right corner making it hard to notice. Additionally, the error messages are cryptic and does not properly explain what has to be done to solve the issue which makes it hard for the user to understand. For example if the user wants to create a class in the application. The user needs to fill in a name for the class. If the user let the field be empty, the error message that pops up is "Varning lagligt namn can't be blank". The first thing is that the language in the error message is non consistent. The second thing is that the information in the error message can be hard to understand.

10. Help and documentation

As a new user the only help that is given is some information at the top of every page. More like a general help what the page shows. However, more help is not shown at the page. There is a video guide in the menu where the creators are giving the user information about the program, but not directly information which functions there is and how to use it.

Beskrivning Woof	Skala 1	Skala 2	Skala 3	Skala 4	Skala 5
1. Synlighet av systemstatus.					
2. Överensstämmelse mellan systemet och verkligheten.					
3. Användarkontroll och användarfrihet.					
4. Konsekvens och standarder.					
5. Förebyggande av fel.					
6. Igenkänning snarare än erinran.					
7. Flexibilitet och användningseffektivitet.					
8. Estetisk och minimalistisk design.					
9. Hjälp användare känna igen, diagnostisera och få hjälp att rätta till fel.					
10. Hjälp och dokumentation.					

Table 3.1: The principles rated from one to five, five being the best.

3.1.3 Exploratory Survey

An exploratory survey was made to obtain more feedback and insight to what features could be interesting to look further into. The survey was sent to already existing users in Denmark with 27 questions. The questions was meant to give an understanding of how the program work, if there are any features missing and if there are any difficulties. The survey started with questions such as the gender of the user, how old the person was and how often the user had used the program. It then proceeded to ask questions regarding the different functions. The questions were mixed with open-ended responses and statements based on different features that the user answered on a scale of either "I strongly agree" or "I strongly disagree" with the statement. The full survey can be found in appendix A.

Results

Unfortunately, the survey only received five answers. So a solution was to send out the survey once again as a reminder to users in order to receive more usable data from more individuals. The problem that arose with this was that a new version of the platform was released. The new version covered some of the questions asked in the survey that did not exist in the version before. An example of a question that was affected was if a delete-class function was needed since this was implemented in the new version. This meant that if the survey was sent out again, this question would no longer be accurate.

The results from the survey that was sent out gave five responses from differ-

ent users of where four were females and one was male. Three of the users was between 25-34 years old and two were between 45-54 years old. When it came to how long the users had been using the platform with their class, it varied, two users had been using the system for four to six months, two users for six months to one year, and one user for zero to three months. Among the users, it varied how often they use the platform, it appears that some use it once a day, others once a week, but also several times a day.

Four out of five users thought it was self-evident how to create a class on the home page. One person thought it was quite self-evident. The “add a teacher” function had not been used by all five users, only three out of five participants. The question of whether there are any changes that can contribute to an easier navigation or better experience of the home screen did not come from any of the users. They seemed satisfied with how the home page looked and worked. Four out of five individuals had used the WOOF/Challenge/Brain break feature on the platform. Of these four people, one individual felt it was not so easy to WOOF. One out of four people felt there were difficulties understanding what needs to be done to unlock the challenge and brain break features. Three out of five had used the rules/strategies/values function. One out of three users felt it was not self-evident how to add a value for the class.

The insight function had been used by four out of five people. Of these four, there were three users who did not think it was easy to use this feature. When it came to the different graphs that are in the insight feature, one out of four thought it was neither difficult nor easy to understand what the different graphs show, while two out of four did not think it was completely understandable. One user commented on the question of whether there is anything that could simplify navigation and improve user experience in the overview feature that there could be a “key explanation” to the different graphs, or some kind of information that pops up when you hover over it with the arrow that explains what it means, or a question mark that you can click on so that an explanatory text appears what the user sees.

The survey was concluded with general questions about the entire platform. An interesting question was, if the users thought something was missing from the platform. There were given multiple different options for the user to choose from. One out of five people thought that a back-button on the pages could be added to go to the previous page. One out of five users thought that one could add information about the different features in the Woof-space. Additionally, it was one out of five users who thought that one could add a guide to beginners.

3.2 Brainstorming

After getting to know the system and identifying some points of improvements a brainstorming session, conducted by the two project leaders, was held to further investigate and discuss what could be done to improve the UX for the program.

The brainstorming session concluded a five minute individual brainstorming where ideas was written on post-it notes. When the five minutes past, a discus-

sion was held. The most fitting solutions was taken in act for further design to the Lo-Fi prototype.

3.3 Affinity Diagram

From the brainstorming session it was made a Affinity Diagram, this to put all ideas in a ranking order. To sort and prioritize the ideas that was important and that needed to be done to facilitate the usability of the application and to improve the user experience. In figure 3.12a the Affinity Diagram was done by dividing ideas from the brainstorming into different categories, and figure 3.12b show the ideas prioritized.

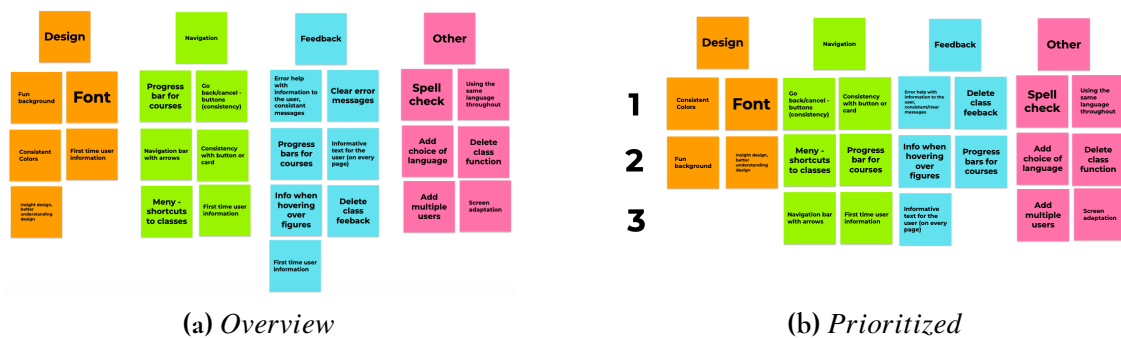


Figure 3.12: Shows the Affinity Diagram that was made of the system.

3.4 Product Breakdown Structure

To get a greater view of the program and where improvement was needed a Product Breakdown Structure (PBS) was made, see figure 3.13. Post-it notes from the brainstorming were placed where fitted which made it more clear what should be focused on when continuing with the Lo-Fi prototyping. Many of the post-it notes were concentrated on the home screen, as well as insights within the Woolf-space.

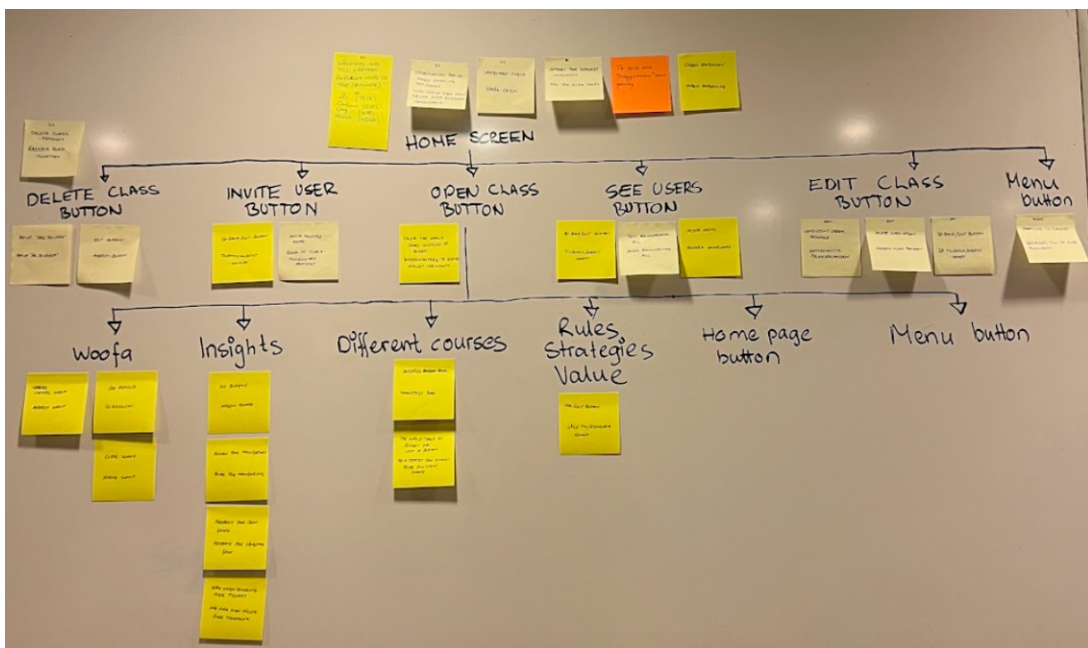


Figure 3.13: Shows the Product Breakdown Structure of the original application.

Chapter 4

Low Fidelity Prototyping

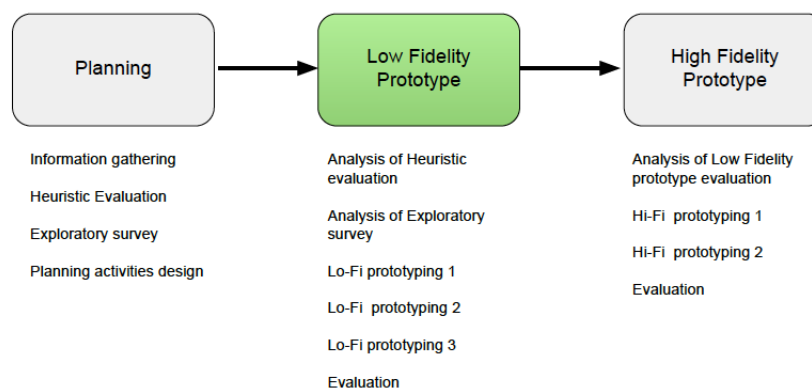


Figure 4.1: The work process illustrated in the different phases, shows Lo-Fi Prototype as current phase.

When the planning phase was done it was time to start developing Lo-Fi prototypes. In this phase the information gathered in the previous phase was analyzed, this result was then translated into three different Lo-Fi prototypes that was evaluated through user testing. This phase and its activities are illustrated in figure 4.1.

4.1 Analysis of Planning Phase

This section presents what the development of the Lo-Fi prototypes is founded on. The result from the heuristic evaluation and the exploratory survey was analyzed which is presented below.

4.1.1 Heuristic Evaluation

From the heuristic evaluation it was clear that the program needed more visual feedback in form of feedback messages. Another important finding was making the language consistent with the whole program in Swedish. Further, emergency exits needed to be implemented for many of the functions giving the user the option to for example cancel when creating a class. It was also found that the flexibility needed some improvement, therefore a go back button could be implemented to give the user another option to navigate with than the menu. Another finding to be improved was the error handling. This involved more clear error messages, the placement of error messages and how to recover from errors. Lastly, it was also discovered that additional describing information could be added to improve the usability. But also in general, remove all unnecessary pages that opens up, that do not need to be on a whole new page.

4.1.2 Exploratory Survey

Considering that only five people answered the survey, it was a bit difficult to draw conclusions from it. However, some of the results aligned with the findings in the heuristic evaluation which only strengthened these points.

4.2 Design

When it was time for prototyping it was decided that three different prototypes were to be designed. The first and the second prototype was similar to the original application while the third prototype was designed a bit different in comparison. In general the prototypes aimed to use the same language throughout the application, offer escapes if the user accidentally clicked on the wrong button, and to provide useful feedback to the user. In addition to that, the Lo-Fi prototypes explored how to present the insight in the best way.

4.2.1 Low Fidelity Prototyping one & two

In this section the first and the second Lo-Fi prototype will be presented. The design of the two prototypes was similar to the original application, with small changes for two reasons. The first reason for this decision was because the original application were still under development meaning that functionality changed throughout the project making it unreliable when performing test. The second reason for this was to test different ways to implement new functionality making it easier to compare with similar design.

The start pages for both prototypes are seen in figure 4.2. To compare it to figure 3.2 the functionality was not very different. The button to create a new class exist in the both prototypes, however the design of the buttons differed. Furthermore, with the first prototype, the left one in the figure 4.2, the user is able to remove a class by pressing an X in the right corner of the class-card. In

comparison, the function to remove the class in the second prototype was put into the edit session marked as a pen that exist in the right corner at the class-card. The edit session in the first prototype was also represented by a pen but with another placement than the second one. Additionally, to open a class in the first prototype (the left picture) in figure 4.2 the user can click anywhere on the class-card in contrast to the second prototype (the right picture) where the user needs to click on the button "Öppna klassen".

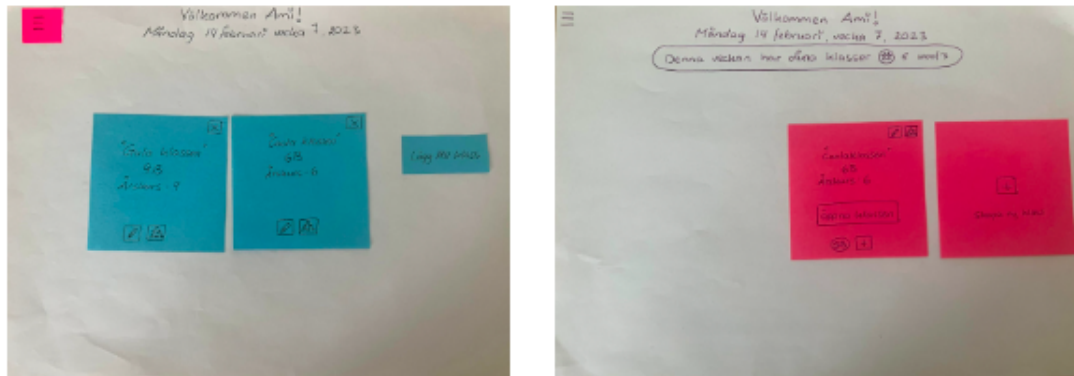


Figure 4.2: Startpage for the first and the second Lo-Fi prototype. The left picture shows the first Lo-Fi and the right picture shows the second Lo-Fi.

The Woof-space for the class is shown in figure 4.3. The design of the two prototypes was made a bit different from each other to find the best way to display the information. It is possible for the class to have different rules, strategies and values in text format, which in the first prototype (left picture) in figure 4.3 are displayed all at once. For the second prototype (right picture) these are displayed in different tabs in the same way as the original application. In the first prototype (the left picture) in figure 4.3 three buttons and a progress bar under the buttons can be seen. The button with a paw on it kept the same functionality for both prototypes as the original application which was to WOOF. The progress bar for the first prototype was made to communicate to the user how much there is left to unlock, for example, "Utmaningar". The right picture in figure 4.3 shows only the WOOF button without the two other buttons to compare if the user even needed the information of the other two functions before activated. As a note, it was first after the creation of the prototype it was found that the functions "Utmaningar" and "Brainbreak" was not implemented yet.

To go more deep into the result, in the first prototype (left picture) in figure 4.3, the whole card called "Översikt" was made to be clicked to be consistent throughout the application. For the second prototype (right picture) a button called "Översikt" was placed instead, also to follow the specific design.

The only difference between the first and second prototype when opening "Översikt" was the way the navigation was designed. The first prototype was

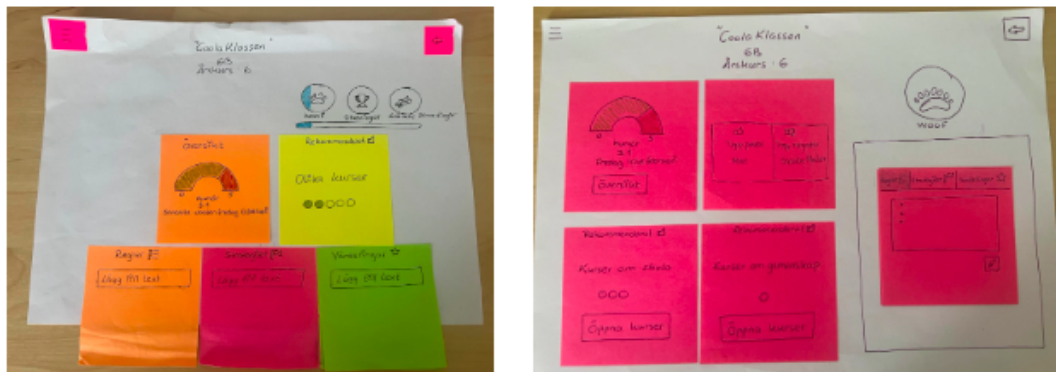


Figure 4.3: Shows the Woof-space for the first and the second Lo-Fi prototype. The left picture shows the first Lo-Fi and the right picture shows the second Lo-Fi.

designed with arrows to navigate between the different graphs and had dots representing what page the user was at. The second prototype did only have the dots, as in the original application, functioning both as buttons and navigation feedback. These designs can be shown in figure 4.4 and figure 4.5.

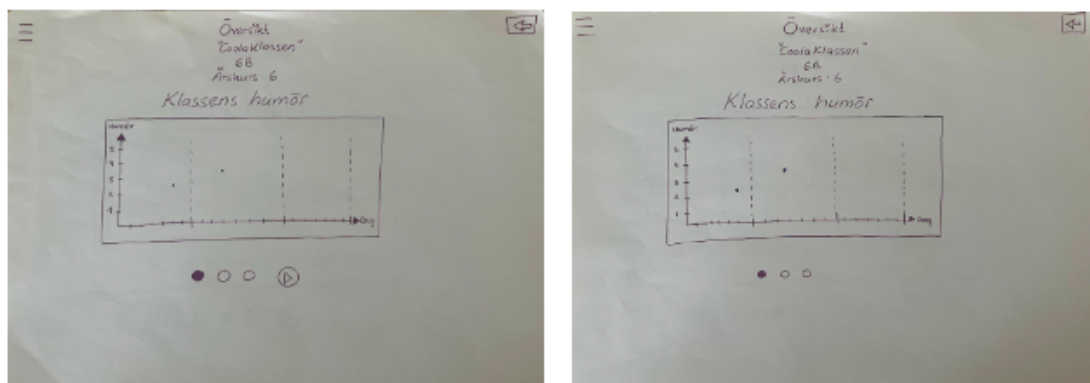


Figure 4.4: Shows the overview of the class. The left picture shows the first Lo-Fi and the right picture shows the second Lo-Fi.

In the Woof-space, see figure 4.3, the user can choose to WOOF with the class by clicking on the WOOF button. The page that opens up is seen in figure 4.6. This page was made for all three prototypes since no changes were made. At the left side the QR-code is shown and at the right the feedback on how many

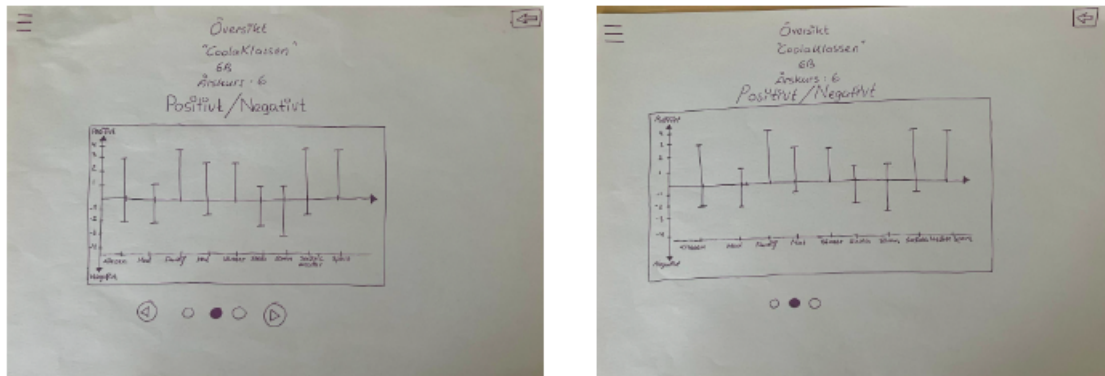


Figure 4.5: Shows the overview of the class, the second graph. The left picture shows the first Lo-Fi and the right picture shows the second Lo-Fi.

people that has answered. To see a short summary of the result the user needs to click on the button "Se resultatet för WOOF", which displays the summary, seen in figure 4.7.

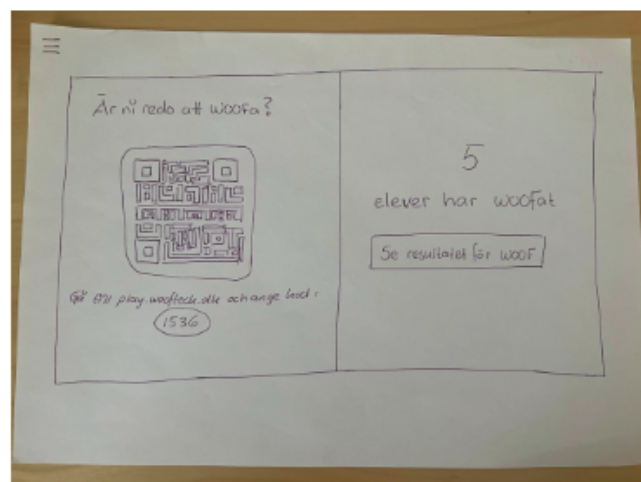


Figure 4.6: Shows how the WOOF looks like for the user.

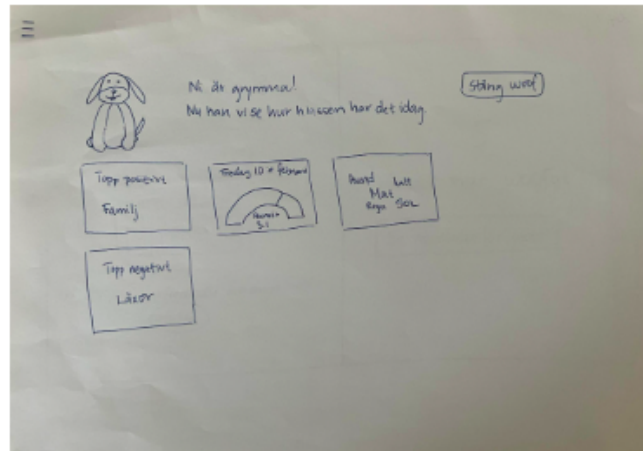


Figure 4.7: Shows the result, after the user quit the WOOF-function.

4.2.2 Low Fidelity Prototyping three

The third Lo-Fi prototype differed more from the original application than the first and the second Lo-Fi prototype. This was to explore the navigation within the program with focus on the Woof-space.

The start page for the third Lo-Fi, in figure 4.8, is a combination of the first and the second Lo-Fi prototypes. Here it is possible to create a class in the same way as in the original application but there is also a function to delete an already existing class, which is done with an X in the upper right corner of the class-card in the same way as for the first Lo-Fi prototype. The edit class function was still represented by a pencil and was designed very alike the original application however, the option to abort was added in case the user were to accidentally click on the pencil. Since the list of users did not have a function it was discarded, therefore the icon with three heads got to represent the add teacher function. This icon including the pencil icon was placed in the lower center of the class-card away from the X to not cause an accidental deletion of a class.

The WOOF-space differed the most for this prototype. The original WOOF-space contained a lot of information for the user to process and therefore the information was divided into different tabs for the third prototype. The default tab when entering the WOOF-space is the one seen in figure 4.9 marked in grey in the navigation bar to communicate that this tab is selected. On this page the button to WOOF can be found as well as a summary of the latest WOOF performed. In contrast to the original application, Lo-Fi one and two, the summary is not shown in a window that the user can close but instead collected directly into the WOOF-space with all information whereas the original application only showed some of the result when the summary had been closed. Aside from the WOOF result the rules, values and strategies are presented separately in contrast

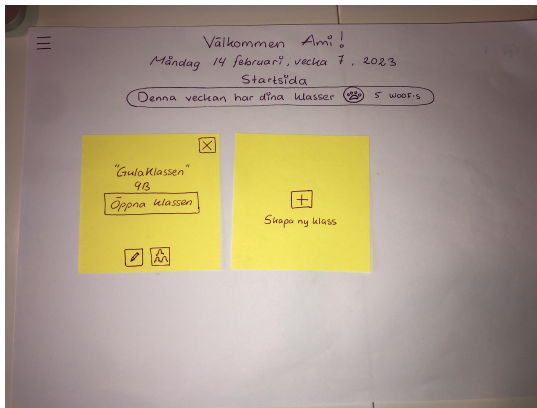


Figure 4.8: Start page for the third Lo-Fi prototype.

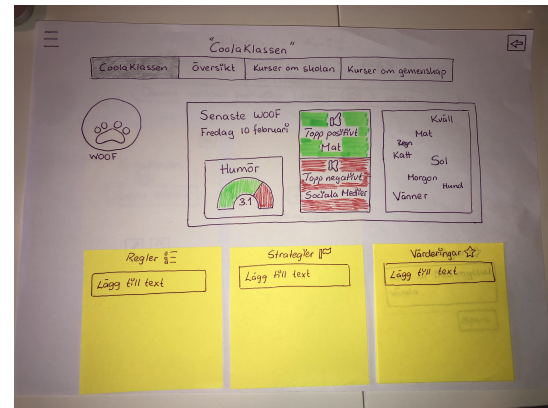


Figure 4.9: WOOF space for the third Lo-Fi prototype.

to the original application and Lo-Fi two which display them in different tabs.

As for the insight or "Översikt" shown in figure 4.10, instead of displaying one of the graphs this page contained three different cards representing the three graphs available. This was done to evaluate if the user needed or preferred more overview over what graphs that does exists. One of the graphs is represented in figure 4.11. To alternate between graphs the user has to use the button with an arrow in the top right corner. This button navigates back to "Översikt" where the user can choose another graph to look at.

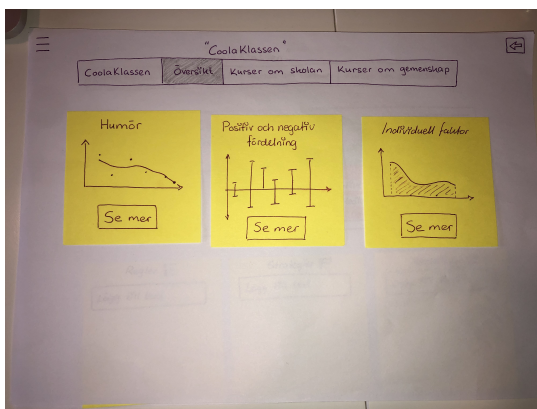


Figure 4.10: The tab "Översikt" is chosen. This figure shows the third Lo-Fi prototype.

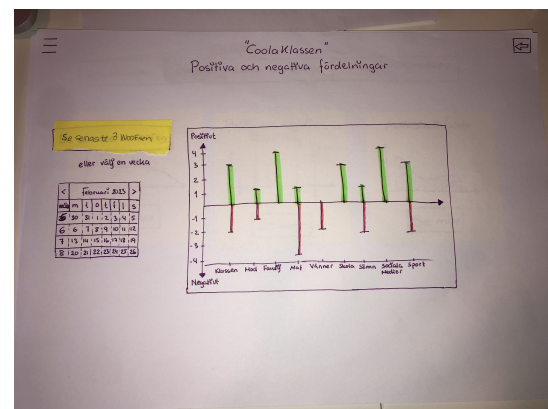


Figure 4.11: Shows the graph "Positiv och negativ fördelning" for the third Lo-Fi prototype.

4.3 Evaluation

When the prototypes were finished it was time to evaluate their usability. This section will present the setup of the test, the procedure as well as the results.

4.3.1 Set up

Three different prototypes had been made to see how the participants react on the different designing solutions. Therefore, three different groups were gathered, with six participants in each group. All three groups performed the same test cases where each group tested one prototype solution to avoid recognition to affect the usability result. During the test sessions there were two roles, one test leader which communicated with the test participant and one that took notes during the test.

Pre Test Case

The test leader's task was to give the participants information around the program that was tested so that the participants understood what the program was about. The test leader also informed the participants that the test was evaluating the prototype's functionality rather than the person's knowledge. Moreover, the test leader informed the participants that they are anonymous and that the data will be saved until the project ends. Since the program is intended for teachers, the participants were encouraged to act as if they were teachers using the application for the first time. Lastly, the test leader urged the participants to think aloud.

Test Scenario

The test scenario consisted of six test tasks. Each task the test leader read out loud for the participant and the other test leader took notes on how the participant navigated and commented during the time. The tasks are shown below and in between some of the test tasks some more information was given to the participant which is shown in italics:

1. You are a teacher who wants to use the program for your students. Your task is to create a class in the program for your class 6B with the nickname "CoolaKlassen".
2. Now that you have created a class for 6B, you also want to add your work colleague Anna Larsson who should also have access to the class. Anna Larsson's email address is am3646mi-s@student.lu.se.
The user creates a class and sends an invitation. You have now created the class 6B and also added your colleague Anna Larsson who has access to the class.
3. Now you want to get started with the work in class 6B. You have agreed on values together in class. You now want to go to 6B's class page and add the text "Everyone is equally valuable".
4. Your old class "The Yellow Class" has finished school. Your task is to remove the class from the program.
5. Return to "Coola Klassen's" class page. Your task is now to work with your students for the first time.

Your students scan the qr code and answer some questions about the mood and what is positive and negative. Now all 5 students in the class have answered and you want to see the result.

After you have reviewed the results together, you want to close the summary.

6. It has now been a week, "Coolaklassen" has Woofat a few times. You want to get an overview of the class's progress during a period of one week back. You want to see how many positive and negative clicks "Sleep" received.

Post Test Case

A survey was created to investigate how difficult the participant thought the design based on the test scenarios was. The survey was made to gather quantitative data and the reason for not using a SUS questionnaire was because details regarding specific functions were of focus for this testing. The SUS survey gives a more general feedback on the user experience of the program and that was not what was needed in this case, because of that a SUS survey was not used.

The two first questions gathered information about the participant. The following questions, three to eleven, were phrased as statements focusing on each feature with answers ranging on a scale from one to five representing "Not correct at all" respectively "Totally correct".

1. How old are you?
2. What gender do you belong to?
3. I consider myself a technical person.
4. It was clear how to create new classes.
5. It was clear how you added your work colleagues to the class.
6. It was clear how to remove classes.
7. It was clear how to add a text to "values".
8. It was clear how to do a WOOF.
9. It was easy to navigate to "Overview".
10. It was easy to navigate between the different graphs.
11. It was easy to read the data from the graph.

4.3.2 Participants

For the Lo-Fi prototype testing a total of 18 participants were scouted. These participants was divided into three groups with six participants in each group. This was done because there were three different Lo-Fi prototypes to test. A participant was only meant to test one Lo-Fi prototype.

First Low Fidelity Prototype

At the first Lo-Fi prototype there was six participant that participated, four out of six was between age 18-24, one out of six was between age 25-34 and one out of six was between age 55-64. The gender distribution was even. One out of six participants considers themselves as a technical person, four out of six participants considers themselves as a decent technical person. One out of six was neutral, the participant considered themselves neither as a technical person nor as a non-technical person.

Second Low Fidelity Prototype

The second Lo-Fi prototype there was six participant that participated, three out of six was between age 18-24, two out of six was between age 25-34 and one out of six participants was between age 55-64. Four out of six participants was women and two out of six participants was men. One out of six participants considers themselves as a technical person, four of six participants considers themselves as a decent technical person. One out of six considered themselves as a less technical person.

Third Low Fidelity Prototype

Six participants participated for the testing of the third Lo-Fi prototype, three out of six was between age 18-24, one out of six was between age 25-34 and two out of six participants was between age 55-64. Four out of six participants was women and two out of six participants was men. Two out of six participants considers themselves as a technical person, two out of six participants considers themselves as a decent technical person. One out of six participants considers themselves as a less technical person. One out of six considered themselves as a non-technical person.

4.3.3 Procedure

The procedure for the Lo-Fi testing was made in three groups. In every group there was a test leader that read out loud the test scenarios and another test leader that observes the participant and took notes.

At the beginning, the test leader gave information about the test and what the participant needed to know. Then, when the participant was ready the test started. The test leader gave the Lo-Fi prototype to the participant and started to read the test scenarios out loud. While the participant performed the test the test leader changed the pages and post- its to simulate an actual web page. One participant was only allowed to test one Lo-Fi prototype, this to avoid that the participant recognize functions and affect the usability result.

The same performance was made for all three Lo-Fi prototypes. When the test was done, the test leader gave a survey to the participant on the computer. When the survey was filled out by the participant the test leader held a discussion where the participant could comment on things in general.

4.3.4 Results

The result will be presented in this section divided into three different parts for the three different Lo-Fi prototypes.

First Low Fidelity Prototype

To create a class went well for all six participants. However, to add a teacher was a bit tricky, three of six participants thought it was completely easy, two of six did not think it was that easy, and one of six was neutral in the question. The test leader noticed that three participants had problems to understand where to click to add a teacher. Five of six participants thought that it was very easy to understand where to delete a class, whereas one of six did not think so. From the observations of the test, two of six participants did not click at the right button for deleting a class.

Four of six participants thought that it was very easy to find where to add values. One of six participants did not think it was completely easy to understand where to add a value, and one of six participants was neutral in the question. Five of six participants thought that it was completely easy to understand where to do a WOOOF and one of six participants did not think it was very easy to understand.

Four of six participants thought that it was completely easy to find the insight, and two of six participants did not think it was as easy to find. Five of six participants thought that it was completely easy to navigate between the graphs, and one of six participants did not agree that it was easy to navigate between the graphs. Four of six participants thought that it was completely easy to understand the data in the graph, and one of six participants did not think it was completely easy to understand and one of six participants thought that it was hard. In the graph function the majority of the participants thought that the arrow under the graphs was a "play" button and not a "next" button.

Second Low Fidelity Prototype

To create a class function went well overall, five out of six participants thought it was completely easy, and one of six participants did not think it was very easy. To add a teacher was a bit harder, three of six participants thought it was completely easy, one of six did not think it was easy and two of six thought it was very hard. The test leader noticed that three participants had a problem with this function to understand where to click to add a teacher. One of six participants did think that it was completely easy to understand where to delete a class, one of six did not think it was completely easy. However, two of six participants thought it was hard, and two of six participants thought it was completely hard to understand. From the observations it was found that four of six participants did not click at the right button for deleting a class.

Four of six participants thought that it was completely easy to find where to add values. One of six participants did not think it was completely easy to understand, and one of six participants thought it was hard to understand where to add a value. According to the observations two of six participants clicked

directly at the field instead of the pen first. Five of six participants thought that it was completely easy to understand where to do a WOOF and one of six participants did not think it was completely easy.

Four of six participants thought that it was completely easy to find the insight, and two of six participants did not think it was completely easy to find. Three of six participants thought that it was hard to navigate between the graphs, and three of six participants thought it was completely hard to navigate between the graphs. Five of six participants thought that it was completely easy to understand the data in the graph and one of six participants did not think it was completely easy to understand. The test leader noticed that four of six participants wanted to swipe between the graphs, and three of six participants thought that the dots under the graphs was hard to understand what it meant. The participants had a hard time understanding that there was more than one graph.

Third Low Fidelity Prototype

All six participants thought it was completely easy to create a new class. It was trickier to add a teacher in the class, two of six participants thought it was completely easy, three of six did not think it was completely easy and one of six thought it was hard. The test leader noticed that two of six participants had a problem understanding where to click when wanting to add a teacher. Three of six participants did think that it was completely easy to understand where to delete a class, two of six was neutral in this question and one of six participants thought that it was hard to understand where to delete a class. The test leader noticed that three of six participants did not click at the right button for deleting a class.

Five of six participants thought that it was completely easy to find where to add values. One of six participants did not think it was completely easy to understand. Five of six participants thought that it was completely easy to understand where to do a WOOF and one of six participants was neutral in the question.

Five of six participants thought that it was completely easy to find the insight, and one of six participants did not think it was as easy to find. Three of six participants thought that it was completely easy to navigate between the graphs, one of six participants thought it was easy to navigate between the graphs, one of six participants was neutral in the question and one of six participants thought that it was hard to navigate between the graphs. Two of six participants thought that it was completely easy to understand the data in the graph, two of six participants did think it was easy to understand the data in the graphs and two of six participants was neutral in the question.

Chapter 5

High Fidelity Prototyping

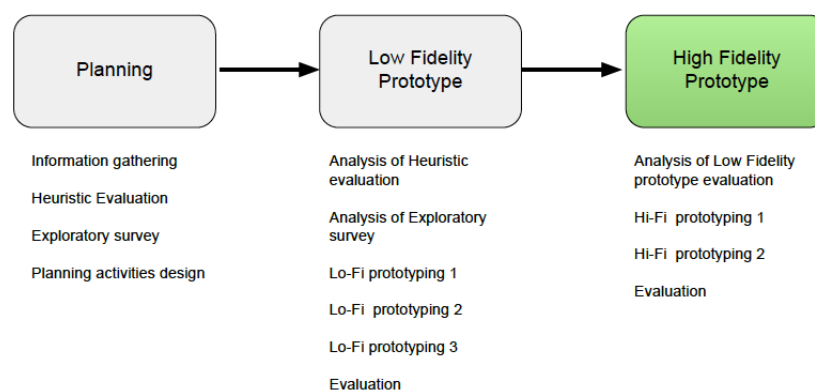


Figure 5.1: The work process illustrated in the different phases, shows Hi-Fi Prototype as current phase.

Evaluating the Lo-Fi prototypes gave lots of valuable feedback on what could be changed or incorporated into the Hi-Fi prototypes. This chapter presents the process of producing the final prototypes as well as the final usability test and its results. This phase and its core activities are illustrated in figure 5.1.

5.1 Analysis of Low Fidelity Prototypes

Since the first and second Lo-Fi prototype was very alike it was decided that these two would be combined with all their best features and their feedback from the participants into one Hi-Fi prototype. This was also to keep one prototype very similar to the original application to be able to compare it with another version. Further, the second Hi-Fi prototype was made based on the third Lo-Fi

prototype and the feedback that was given from the test. In this section it will be presented which feedback from the different Lo-Fi prototypes that generated the two Hi-Fi prototypes.

5.1.1 First & Second Low Fidelity Prototype

From the usability test there were some things that worked better for the first Lo-Fi prototype and some that worked better for the second.

Firstly, the usability test showed that to enter the Woof-space it was better to use a button instead of making the whole class-card clickable. It was also noticed that additional information of the program for user were necessary.

Moving on, it was observed that keeping the create class function according to the original application and to the second Lo-Fi would be the best option since it worked very well. The testing showed that it was easier to delete a class with an X in the corner of a class-card instead of opening the edit function. However, since the original program did not have a function for deleting a class, it was decided that the two different ways of deleting tried in the first and second Lo-Fi would be further evaluated in the Hi-Fi prototypes.

From the test it was clear that everything regarding the users should be placed together and represented by one button instead of two. The list of users was not incorporated in one of the Lo-Fi prototypes since it was not possible to edit the list in the original program. Therefore, adding the possibility to edit the list seemed to be a great development.

There was no big difference in the function for the rules, values and the strategies, only how they were displayed. Of this reason it was decided that further evaluation was needed for both options.

Since it was found that the "brainbreak" and "utmaningar" was not implemented yet it would best to not show them at all. Moving forward the WOOF button would be kept as it was in the second Lo-Fi. When it came to the insight and graphs, it was shown that the navigation between the graphs with three dots needed more clarification with an even more clear arrow next to them.

5.1.2 Third Low Fidelity Prototype

From the usability testing it was clear that more information was also needed here. To add and remove a class worked well and as mentioned further evaluation of the delete function was of interest. Therefore the same design was decided to be kept. The button to handle users was decided to be kept but how to edit the list of users needed to be explored. To further investigate how the strategies, rules and values was best displayed it was kept as in the third prototype, separate from each other. The WOOF button will placed and designed as in the third Lo-fi prototype.

The layout with dividing woof-space, insight and courses into different tabs seemed appreciated therefore this was decided to be kept. The thing that needed to be further evaluated were the display and use of the calendar for one of the graphs.

5.2 Design

The Hi-Fi prototypes were made using the prototyping tool Figma. Two different Hi-Fi prototypes was made so that it would be possible to compare the design solutions to each other. The first Hi-Fi was a continued development of the third Lo-Fi prototype according to the results gathered from the testing of the Lo-Fi prototype. The second Hi-Fi prototype is a continued design of the results from the testing of the first and the second Lo-fi prototypes.

The start page is shown in figure 5.2, where the figure 5.2a shows the first Hi-Fi prototype and figure 5.2b shows the second Hi-Fi prototype. The start page of the different Hi-Fi prototypes are very similar in the design however, some functions were done different. For example, the delete class function was for the first prototype, shown in figure 5.2a, implemented as a garbage can in the top right of the class-cards whereas this function was put into the editing session for the second Hi-Fi prototype to see what worked best since the original application did not have the function at all.

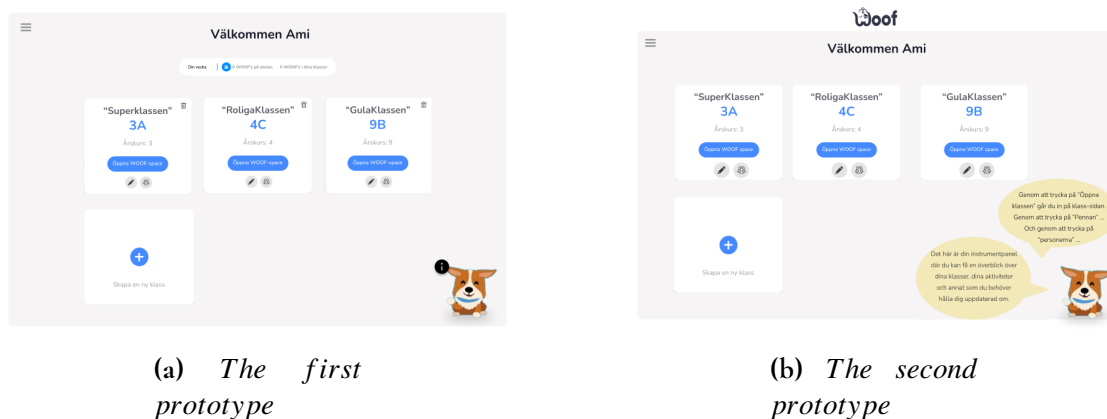


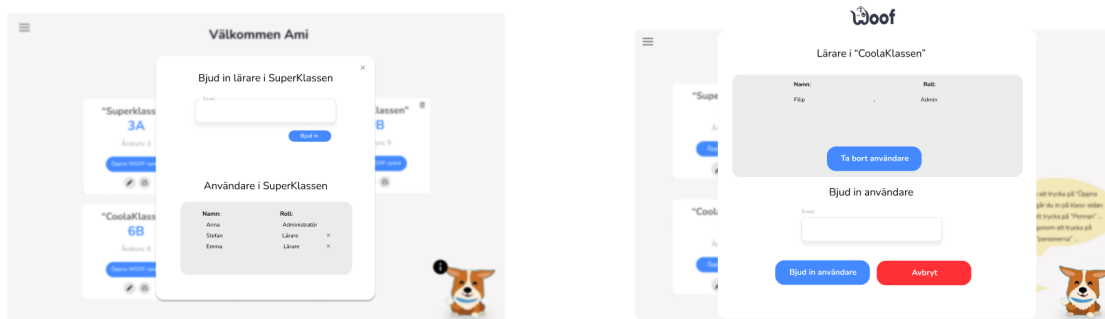
Figure 5.2: Shows the start page for both Hi-Fi prototypes.

Based on the heuristic evaluation, the conclusion was made that as a new user it could be hard to understand what could be done throughout the application. Because of that, two different types of information was made to inform and help the new user. The first Hi-Fi prototype was design so that the user could click on the "i" at the dog in the right corner of the page, see figure 5.2a if help was needed. In contrast, the second Hi-Fi prototype was design so that the user did not need to click anywhere to be able to find the information. The information was given directly from the dog in speech bubbles, see figure 5.2a.

Since the result indicated that buttons were preferred instead of making a whole card clickable this was implemented throughout both prototypes. Continuing with the editing session represented with the pen button on the class cards, see figure 5.2, the function is the same for the both prototypes except the delete option for the second prototype. At the original application a hole new page opened up when adding or editing a class, whereas for both prototypes these sessions was made as pop up windows where the start page still could be seen in

the background. This was made to hopefully facilitate the sense of navigation control for the user. An example of this can be seen in figure 5.3.

At the start page there is also a button on the different class cards that looks like three people. When the user clicks on that button a pop up window appears, see figure 5.3. Everything regarding different users was gathered under the same session where it was made possible to invite new users and edit the list of users with access to that specific class. In the first Hi-Fi prototype, see figure 5.3a, it was made possible to remove a teacher by pressing the X beside the teacher's name that are listed. In comparison to the first Hi-Fi prototype, the second seen in figure 5.3b, was designed with a button "Ta bort användare" where a scrollable list of possible users to delete appeared when pressed. To invite users was designed the same however the layout of both functions (edit and invite users) was different to see what the users would prefer.



(a) *The first prototype*

(b) *The second prototype*

Figure 5.3: Shows the invite and delete users function for the both Hi-Fi prototypes.

Different types of escape possibilities were implemented. For the first Hi-Fi prototype the escapes were presented as an X in the corner of a card throughout the application whereas it was presented as a "Avbryt"-button for the second prototype. These differences can be seen in figure 5.3

The Woof-space for both prototypes can be seen in figure 5.4. The first prototype, seen in figure 5.4a, was implemented with a navigation bar at the top of the side in the same way as in the third Lo-Fi prototype with the only difference being the courses being represented by one instead of two tabs. In the second prototype, see figure 5.4b, the Woof-space design was made similar to the original application, to be able to compare the navigation differences.

The WOOF button for each prototype was placed differently to see if the buttons were more visible in some of the cases.

The rules, values and strategies were made in different ways. The first prototype was designed with all three cards next to each other, see figure 5.4a, while the second prototype displayed the cards in tabs like the original application, see 5.4b.

The insight session for the first Hi-Fi prototype was made with the overview page tested in the third Lo-Fi and for the same reason. This page can be seen in

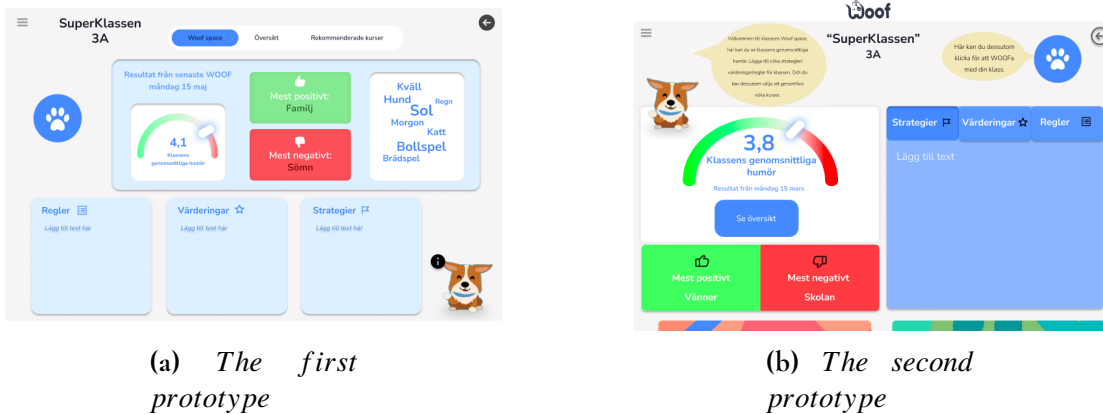


Figure 5.4: Shows the WOOF space for the both Hi-Fi prototypes.

figure 5.5 and differs from the the insight for the second Hi-Fi prototype which displays one of the graphs directly.

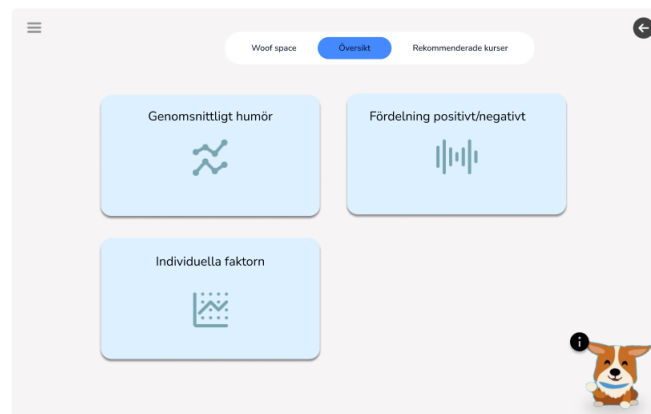


Figure 5.5: Shows the overview page for the first Hi-Fi prototype.

It was only the second graph that was made with some changes. Based on the Lo-Fi prototype testing, the calendar function was hard to understand for the participants. Of this reason, it was made two different ways to interact with the calendar. The first prototype, see figure 5.6a, was made with two different tabs over the graph, one representing the three latest woofs and one representing the chosen week which could be changed with arrows. This to see if it was easier to not have a whole calendar as in the second prototype, see figure 5.6b. The default for both prototypes was made so that the user sees the three latest WOOF sessions in the graph.

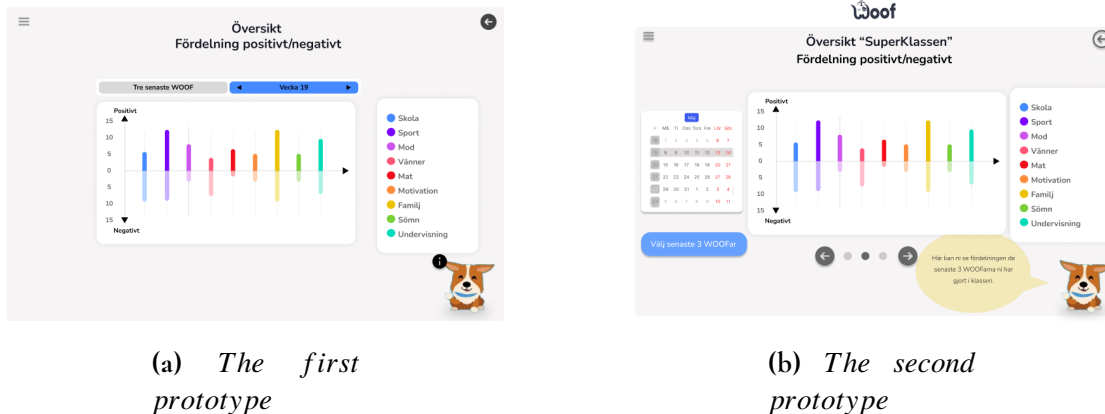


Figure 5.6: Shows the second graph in insight both Hi-Fi prototypes.

5.3 Evaluation

This section will present the set up for the evaluation, the participant and the procedure of the test sessions. Additionally, this section will also present the result of the usability testing.

5.3.1 Set up

The purpose of the this evaluation was to compare the two design solutions to each other. For the test sessions there was two roles, one test leader and another that took notes. These roles switched, so that both could try the different roles. This section will present the different the manuscript, surveys and tasks created for the evaluation.

Pre Test

Before the test started the test leader read the following script out loud for the participant. The script was meant to inform the participant about how the test session will be carried out.

We are evaluating an application that is intended to be used in elementary school from grades 1-9 to improve student well-being. First, you will be asked to answer a short survey with introductory questions. You will then get to test the first prototype followed by a usability survey. Then the second prototype is tested, which is also followed by a survey. Finally, we will run a short interview after the two prototypes.

You as a test subject will be assigned a number that is unique to you. This is so that we can then connect your various tests with each other. Then I will read out scenarios with tasks for you to carry out in the application. If you don't remember what the task is, I can read it again. We would like to encourage you to think out loud when you complete the tests, tell us how you

think and what you do to make it easier for us to follow your various choices. Remember that we are not testing you as a person but the functionality of the prototype.

A survey with introductory questions was made. The questions that was asked in the survey, was the participants test number that was given from the test leader, age, gender, if they see themselves as a technical person and what they work with/study. The survey ended with a informed consent question. The full survey can be found in Appendix B.

Test Scenario

To the test scenario it was made nine test tasks present below. In between some of the test tasks some more information was given to the participant below it is shown as italics.

You are a teacher of the class 6B who wants to know a little more about how the students in your class are doing. You have access to a digital tool to be able to regularly collect information about how the class is doing and work with the information you receive. The platform is called WOOF and WOOF means collecting answers from the students.

1. You want to start by creating a class with nickname: CoolaKlassen, name: 6B and grade: 6.
2. Now you also want to invite the teacher Anna Nilsson to the CoolaKlassen that you just created.
3. Then you want to do a WOOF with your class CoolaKlassen. When 10 students have WOOFed you want to see the summary of the WOOFs.
4. The class: RoligaKlassen has moved up a grade and therefore you want to change the class's nickname to SmartaKlassen, the name to 5C and the grade to 5.
5. You want to delete Filip as a teacher in your class: SuperKlassen.
6. You want to delete the class: "GulaKlassen" from the application.
7. In the class: "SuperKlassen" you have agreed on a new valuation. You want to add the text "Alla är lika mycket värda" in values.
8. You want to see in the overview the positive and the negative distributions. You are interested in knowing what the value of the "mat" category is during week 19.
9. Finally, you want to go back to the home page.

Post test Case

To be able to evaluate the usability a SUS questionnaire was made that can be seen in Appendix C. The SUS survey contained one question about the test number followed by ten statements. The test number was only put into the survey to be able to connect the test answers since one participant would be conducting

two tests. The other ten statements was presented after the question and it was ranked from, one that meant completely disagree and five that meant completely agree as answers. The SUS survey questions are presented below:

1. Your test number?
2. I think I want to use the application regularly.
3. I think the application is unnecessarily complex.
4. I find the application easy to use.
5. I think I need the support of some technical person to be able to use the application.
6. I think the different parts of the application are well integrated.
7. I think there is too much inconsistency in the application.
8. I think most people would quickly learn this application.
9. I find the application cumbersome to use.
10. I feel safe using the application.
11. I will have to learn a lot of new things before I can be productive with this application.

A semi structured interview was planned as well. The interview was meant to gather additional information from the participants after they had tested both Hi-Fi prototypes. The semi structured interview questions are presented below:

1. What are your spontaneous thoughts after completing the tests?
2. What was most difficult about each prototype?
3. What was easiest with each prototype?
4. Was there a feature you really liked?
5. Is more feedback or information needed for the user to facilitate the user experience?
6. Which of the prototypes do you prefer?

5.3.2 Participants

In total there were 30 people participating in the usability testing. Of these 30, 15 identified as women and 15 identified as men making the gender distribution 50 percent in both categories.

Further, one out of 30 of the participants were below the age of 20, 12 out of 30 were between 20-29 years old and the age groups 30-39 and 40-49 were four out of 30 respectively. Lastly, the age group 50-59 were represented by eight out of 30 of the participants and one out of 30 participants were between the ages 60-69.

Moving on, when asked if they see themselves as a technical skilled person 30 percent of the participants said yes, 60 percent answered average and ten percent said no.

Within the group of participants the distribution of occupation consisted of a third working or studying to be working within the educational system. Some working as preschool teachers others as teachers for grade one to nine and the rest as high school teachers. The remaining two thirds of the participants are working within other fields or are students of other fields.

5.3.3 Procedure

The test leader roles was as mentioned in the set up, one communicating with the participants and one taking notes during the test session. One participant at a time performed the test. The test leader gave the participant a unique number, to be able to follow the result for that particular participant. Due to the fact that all participants tested both Hi-Fi prototypes, the prototype which was tested first alternated. This was to make the test as even as possible and to avoid recognition for only one of the prototypes which would affect the result.

In the beginning of the session, the test leader read the introductory manuscript. The participant then got to answer the initial survey collecting background information about the participants. When this was done the first prototype was tested with the tasks read out loud by the test leader while the participant executed them. After this the first SUS survey was answered. The second Hi-Fi was then tested with the same procedure as the first, this too was followed by a SUS survey for the participant to answer.

After this, the semi structured interview took place before the test session was finished.

5.3.4 Results

In this section the result of the collected data during the evaluation testing is presented. The data was retrieved from the SUS questionnaire, observations during the testing and from the semi structured interview conducted at the end of each test session.

SUS

To compare the Hi-Fi prototypes one approach was to compare their SUS-score. This score was calculated from the SUS questionnaire made by the participants directly after each test. The calculation was made according to [11] and turned in to diagrams for better representation. As mentioned in section 2.8.4, the general average for a usability score is above 68 and 80 or more is considered to be above average. For the first Hi-Fi, shown in figure 5.7 the total average SUS-score was 87,8 marking it to be above average in terms of usability. Furthermore, Hi-Fi two had a total average SUS-score of 81,4, also making it above average, and can be seen in figure 5.8.

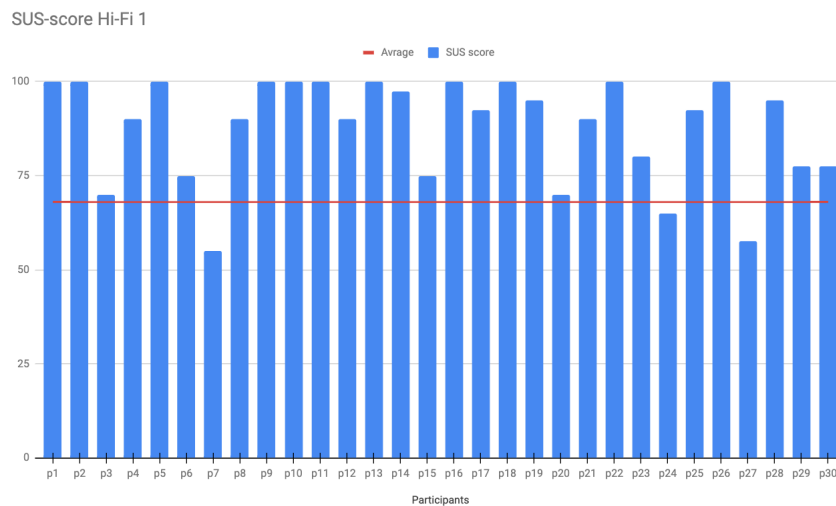


Figure 5.7: Diagram showing the SUS-score for the first Hi-Fi, the red line is the general average 68.

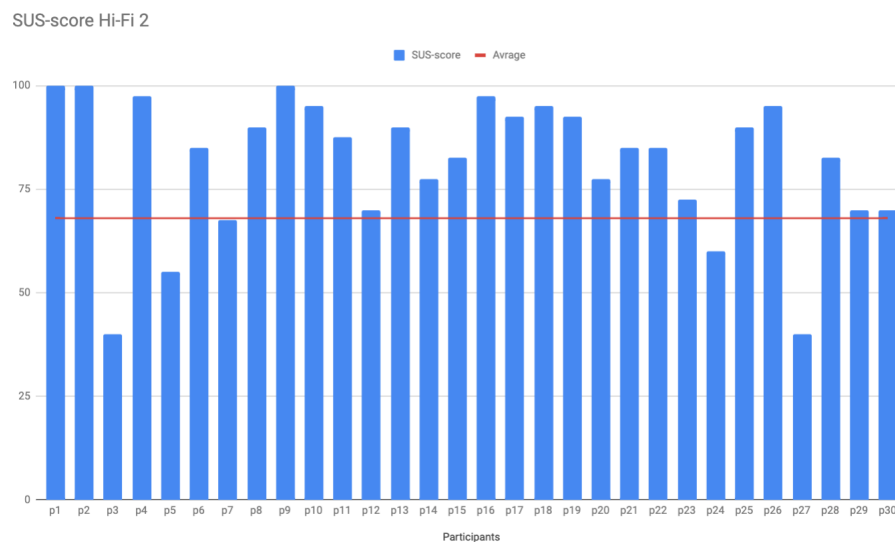


Figure 5.8: Diagram showing the SUS-score for the second Hi-Fi, the red line is the general average 68.

Observations

During the observations it was noticed that the menu and the go back button at the right top of the page was used fairly equal amount of times when the user wanted to go back to the start page.

The functions and features that was noticed by the test leader sticking out during the test was the add/delete user function, the WOOF function, the insight and the graphs especially the calendar function. These functions and features was noticed that the participants either had problems with, or did not do it correct.

In general, the test leader notice that the first Hi-Fi prototype went more

seamlessly comparing to the second Hi-Fi, especially the functions deleting users and removing classes. When comparing the escapes, it seemed like the participants liked the X button in the first prototype better than the "Avbryt"- button that existed in the second Hi-Fi prototype.

Semi Structured Interview

The Semi Structured Interview after the test gave some data from the users about the usability and the user experience of the application. Questions that was asked included what the participant liked most with both Hi-Fi prototypes, what they did not like and what was hard, but also which prototype was preferred to be used by the participants. The questions that was asked to the participant can be seen in Appendix D.

The design of both prototypes had similarities in difficulty regarding functions. These difficulties are represented in a graph in figure 5.9. There was 19 of 30 participants that answered that some functions was hard in the first Hi-Fi prototype. Of these 19 participants, five of nineteen participants thought that the graph function was hard, nine of nineteen participants thought that the WOOF function was hard and three of nineteen participants thought that the icons was hard to understand. However, when it came to the second Hi-Fi prototype there was 26 of 30 participants that answered that some functions was hard. Of these 26 participants, 17 of 26 participants thought that the graph function was hard, four of 26 participants thought that the WOOF function was hard and two of 26 participants thought that the icons was hard to understand.

Difficult functions

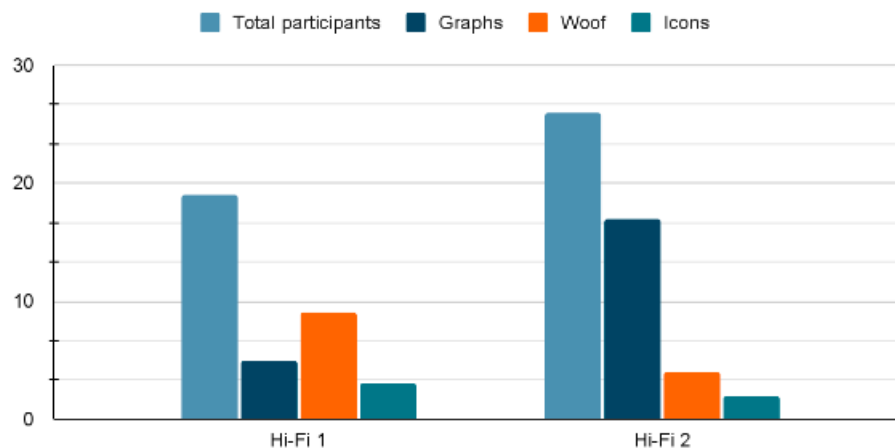


Figure 5.9: Diagram showing the score of the difficult functions in both Hi-Fi prototypes. The different stacks is explained in the top of the figure.

When it come to the functions that was preferred by the participants, it can be seen in figure 5.10. In this case there were 23 of 30 participants that answered for the first Hi-Fi prototype. Of these 23 participants, three participants liked

the edit feature, six participants preferred the create class function, two participants thought that it was easy to navigate between different pages and functions, three participants preferred the add/delete a user function and seven participants thought it was overall easy to use the first Hi-Fi prototype. However, when it came to the second Hi-Fi prototype there was 17 of 30 participants that answered. Of these 17 participants, three participants liked the edit feature, six participants preferred the create class function, two participants thought that it was easy to navigate between different pages and functions, one participant preferred the add/delete a user function and five participants thought it was overall easy to use the second Hi-Fi prototype.

Preferred functions

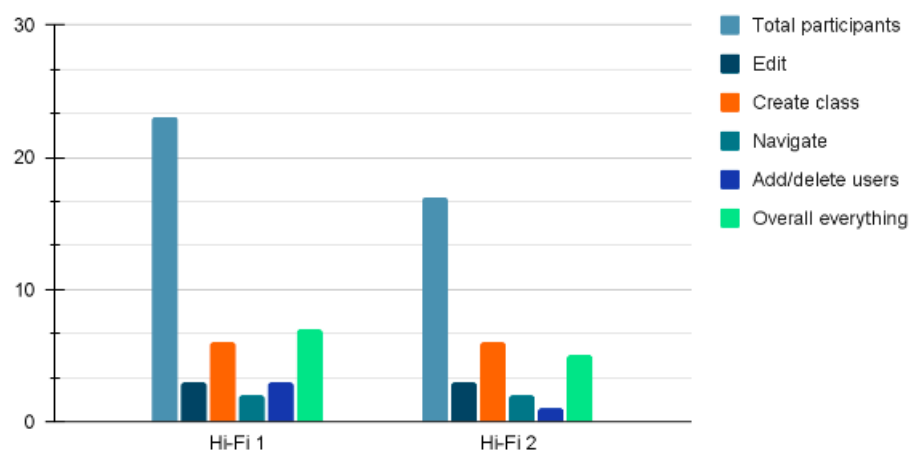


Figure 5.10: Diagram showing the score of the preferred functions in both Hi-Fi prototypes. The different stacks is explained in the top of the figure.

From the semi structured interview there were also comments on the feedback which is represented in a graph in figure 5.11. It was 19 of 30 participants that answered that they would like more feedback or information in both Hi-Fi prototypes. However, of the 19 participants there was six participants that wanted more information, the other 13 participants provided information to the test leader that they wanted the information in a different way than it was given in the first Hi-Fi prototype. The same thing appeared for the second Hi-Fi prototype. Seven of 19 participants wanted more information, and the remaining twelve participants wanted the information in a different way than it was given in the second Hi-Fi prototype. In the figure 5.11, it appeared that the participants that did not want new information, instead information presented in another way. Example of feedback suggestions mentioned by the participants was hover over information and a beginners guide for new users. It was mentioned that in the second Hi-Fi prototype, there was much information provided to the users, but the information was not read.

Lastly, when asked which of the two prototypes that was preferred the majority answered the first Hi-Fi prototype. The result is illustrated in figure 5.12.

More feedback or information

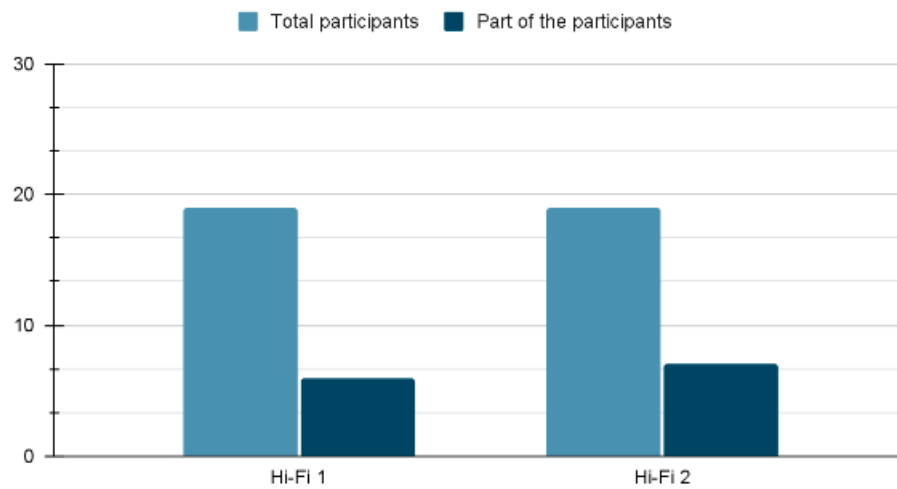


Figure 5.11: Diagram showing the interview score from the question, if more feedback and information is needed in the application to make the application more helpful and useful. The light blue stack presents all the participants that wanted more feedback or information and the dark blue stack presents how many of the light blue that wanted new information.

Preferred Hi-Fi prototype

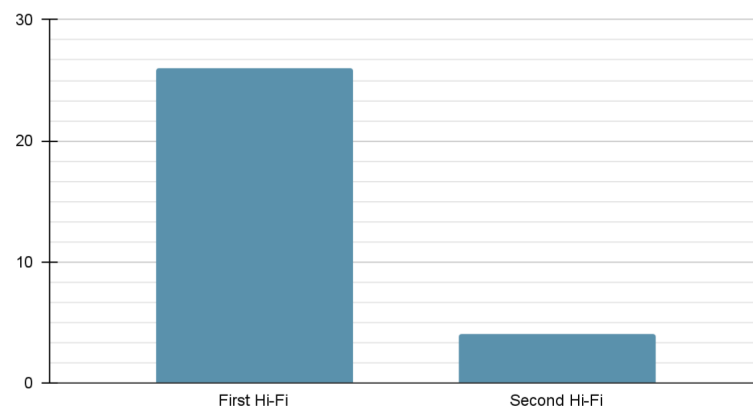


Figure 5.12: Shows the distribution of which of the two Hi-Fi prototypes was preferred by the participants.

Chapter 6

Discussion

6.1 Reflection of the process

This section will present, in general how the process went, what went well and what could be done different to make the process better.

6.1.1 Exploratory survey

The exploratory survey that was done in the beginning of the process, did not go as expected. The survey was sent to the users in Denmark that actually use the program in schools but the response rate was much lower than what was needed in order to draw any valuable conclusions. Since the answering rate was so low a reminder sent out could have resulted in more answers, however the problem was that Woof Technologies during that time had launched new features making parts of the exploratory survey irrelevant and maybe confusing for the participator. The decision was made that the survey could no longer be used.

The time between the first sent out of the survey and the possible reminder was quite long. Since the email list of users was not in possession, Woof Technologies had to be included as a middle man in this process. With more parties involved the possibility of a reminder sent out did take longer than preferred. However, problems would probably still be encountered since updates of functionalities of the original application still happened in parallel.

Additionally, the low answer rate could also be because of the design of the survey. It was quite long and would maybe if designed with less questions have generated more answers.

6.1.2 Low Fidelity Prototype

The original program was difficult to understand because the translation on the Swedish version was not complete and correct. There was no coherence and it made it more difficult to understand and to learn how the program worked. This made it difficult when developing the Lo-Fi prototype.

During the process when creating the Lo-Fi prototypes there was a some misunderstandings and confusions about the brainbreak and challenges functions. In the beginning it was understood as though the brainbreak and the challenges functions would be unlocked when a specific amount of WOOFs had been done in the program. But this was wrong, the functions were shaded in the Woof-space because the functions was not yet implemented. This was not clear and understood at first, therefore the first two Lo-Fi prototypes were created with this in mind. When it was discovered the third Lo-Fi prototype was created differently because of that. Changing the two earlier Lo-Fi prototypes might have affected the result of the usability testing however it would also have prolonged the Lo-Fi prototyping stage.

The Lo-Fi prototype testing was divided into three groups, were one group tested only one prototype. This was made to avoid recognition between the Lo-Fi prototypes. What could be made different was to let all participants test all three Lo-Fi prototypes but to avoid recognition let the participants test all the different prototypes at different times.

Another thing that could be done, was to have more participants of an older age. There was ten of eighteen participants between 18-24 years old and only four of eighteen was between 25-34 years old and 55-64 years old. The problem with this is that people between 18-24 years old are raised with technology and that can affect the result when testing of the Lo-Fi prototypes. However, the target users for the program are of different ages and it does not necessarily mean that it has affected the testing.

6.1.3 High Fidelity Prototype

As mentioned above, after the exploratory survey was sent out to the users in Denmark, a new version of the existing program came. This resulting in that it was not possible to send out the survey one more time in order to get more responses. This affected the process to get more data from users of the already existing program. Moreover, it affected the idea of comparing the original program with the final prototype. By realising this early in the process, the process and work changed. Instead of comparing the existing program with the final prototype, the idea was to make two Hi-Fi prototypes to compare with each other. One of the Hi-Fi prototypes was made more similar to the original program, however with some changes in functionality, and the other prototype completely different in the design from the original program.

When it came to the testing of the Hi-Fi prototypes, all 30 participants tested both prototypes. In the testing of the Lo-Fi prototypes the participants was divided into groups, were each group tested one prototype, this to avoid recog-

dition. Because of how the testing was made for the Hi-Fi prototypes, it may have affected the result. The solution was to let participants test every other prototype first. Another way to perform the testing could be as it was done for the Lo-Fi prototypes. Divide the participants in two groups, and let one group test one prototype and the other group the other prototype. On the contrary, it could be a problem to gather data from the participants which prototype that is preferred. The whole test would have received another main reason.

When letting the user test both prototypes after one another recognition is inevitable. However, recognition might have been minimized if letting each participant test the two prototypes on different occasions. Also, the testing was set up with the same test scenarios for the both prototypes. To decrease the recognition the test scenarios could perhaps been randomized for the second test.

The Hi-Fi functionality was limited to which functions that was in focus to evaluate. This could also have affected the result, because when the participant for example, clicked wrong on a function that had not been implemented it was understood that it was wrong and the participant tried again with a different one. In reality when a participant tries a real application this is impossible, because all functions that exist in the program is implemented. So if there was more time, completed prototypes would be made and tested to avoid the issues encountered.

Another thing that can affect the result is that the participant had no idea of how the application looked from the students view in their devices when answering questions. This could have lead the participants to confusions around the insight function. What could be done different was to let the participant actually perform a WOOOF from a students perspective, this would lead to more understanding for the participant what kind of data that would appear in insight and the graph mode.

Another factor to consider was that the test was performed on a laptop. The original program are meant to be used on a projector or a smart board. The prototypes were made for a laptop, it was not adapted to a projector or a smart board. This can also contribute to a different feeling if the prototypes was tested on a projector or a smart board. Everything is bigger and things that may were small on the laptop, may not be so small on a projector or a smart board.

The original application is meant to be navigated by teachers. However, the testing of the Hi-Fi prototypes was not made on only teachers. The data that was gathered was by different types of people with different occupations, some of them teachers. It would have been interesting to see if the result changed if the test was carried out only on teachers.

Lastly, according to the result of which Hi-Fi prototype that was preferred by the participants, the majority chose the first Hi-Fi. However, the participants that chose the second Hi-Fi prototype that was likely the existing program started with the second Hi-Fi. One reason of this result, can be because the participants felt comfortable with the second Hi-Fi due, they start the test with that prototype. It is interesting that all participants that preferred the second Hi-Fi actually start the test with that prototype. When it comes to the participants that preferred the first Hi-Fi it varied which prototype they started with. Of

this reason the conclusion that is taken, is that the first Hi-Fi was preferred of the majority by the participants.

6.2 Evaluation

When it comes to the SUS score from the Hi-Fi tests it was almost the same, both Hi-Fi prototypes was above average from a usability perspective. However, the first Hi-Fi prototype had higher score than the second Hi-Fi prototype. This means in that the first Hi-Fi prototype was more preferred by the participants comparing to the second Hi-Fi prototype. However, the SUS score are not saying anything about the different functionalities of the prototypes. Instead, it speaks more about the general impression, that the first Hi-Fi prototypes was more recommended and have a better result.

According to the observations the test leader noticed some things that is possible to draw conclusion of and discuss around. For example, the test leader notice that recognition played a big role in the outcome of the last tested prototype. If the participant for example started to test the first Hi-Fi prototype that were designed with crosses to close the pop up boxes, the participant searched for the same crosses in the second Hi-Fi prototype. This could have affected the result.

When it comes to the participants that participated in the test, it appeared that 30% was considered to have technical skills, 60% considered to have average technical skills and 10% of the participants considered themselves not having technical skills. The result could have differed if the groups were more evenly distributed. With more non-technical participants it could have resulted in more meaningful data collected.

For the first Hi-Fi prototype there was 15% that thought it was hard to understand the icons and for the second Hi-Fi prototype it was only 8%. However, this may had something to do with which prototype the participant started with. If the participant started with the first prototype then everything was new for the person. Then the participant recognized the icons in the second prototype because they had already seen it once before.

When it comes to preferred functions for both Hi-Fi prototypes the result was very even. However, certain features stood out in the result. For example, add and delete users, were 13% thought it was easier in the first Hi-Fi comparing to the 5% that thought it was easier in the first Hi-Fi prototype. This could also be involved with which prototype the participant started with.

6.3 Future improvements

Reflecting on the result of this thesis there are both possibilities for future work regarding evaluating the program but also concrete suggestions for Woof Technologies to implement.

This thesis did not focus on weather gamification would be fitted or how it

could be incorporated into this program. However, as Raju et al. [19] expresses, that gamification does increase the user engagement for tools similar to the Woof platform, leading to enhanced user experience. Therefore future research could be made of incorporating gamification into the Woof platform to deepen the usability. At the same time it would be important to investigate if gamification is appropriate for tools made for improving well being. Generally, one maybe should not compete in well being but it could be interesting to see if there were gamification aspects fitting to be incorporated.

Another suggestion for future investigation could be an evaluation of the students view in their devices when performing a WOOE. This combined with evaluating the other modules of the program such as Unicorn would be to further improve the overall usability of the platform.

Lastly, considering the result of the both the heuristic evaluation and the findings through usability testing there are some specific areas of the original application that can be improved. Below concrete suggestions are presented as Critical/short term changes and Non critical/long term changes.

6.3.1 Critical/short term

Some critical changes that should be made, and won't imply long implementation time, to improve the usability drastically are:

- **Language:** The whole application should have consistent language where everything is written in Swedish.
- **Escapes:** All functions should offer escapes. Create class, edit class, invite user etc. should provide some sort of escape if the user accidentally got there.
- **Error messages:** Error messages should be presented in one language, preferably Swedish, and provide clear information to the user.
- **Delete class:** The user should be able to delete classes that's been created.
- **User list:** Everything regarding the users should be gathered in the same place. It should also be possible to edit the list of users otherwise it is deemed not useful.
- **Calendar:** The calendar for one of the graphs in insight does not show the correct date. This should show the right date.

Some of these suggestions could be well applied throughout other parts of the application that has not yet been evaluated as well.

6.3.2 Non critical/long term

Some non critical changes that might improve the usability of the program and some long term changes which might require longer implementation time is suggested below:

- **Tabs:** Dividing the Woof-space into several tabs to get more overview and avoiding giving the user too much impressions.

- **Beginners guide:** Introduce the possibility of a beginners guide, guiding the inexperienced user through the application and its different functions.
 - **Hover-over information:** When holding the mouse over an icon or button a small text describing what it means pop up.
 - **Insight:** The navigation in insight could be updated. For example, have a front page with all the different graphs creating an overview for the user.
- These suggestions are more optional than the critical ones mentioned above.

Chapter 7

Conclusion

This master's thesis aimed to evaluate a tool used for improving students well-being and the goal was to suggest improvements for better usability before further integration in Sweden. An iterative working process resulted in two prototypes which were evaluated and compared to the original application to answer the research questions, which are concluded below:

How well does the existing design of the application perform based on a heuristic evaluation and what differences should be made to improve the user experience?

One clear improvement of the existing program would be that it needs more visual feedback in form of feedback messages. Another important improvement which is missing today, is having consistent language throughout the program. Moreover, options as cancel and go back buttons is also important for the user to be able to navigate more seamlessly. To make the application even more clear and easy for the user is adding more descriptions to give the user the information that is needed. Some details, that also can improve the usability for the user is to remove unnecessary pages that opens up and that is not needed on a whole page for example the list of teachers that has access to the specific class.

By comparing it with new developed design, what could be done both short term and long term to improve the existing application's usability?

Short term there are several opportunities of improvement. The critical changes would be to have consistent language through the whole program, cancel or escape buttons for every function and having error messages that are understandable and clear. Further, implementing the function to delete a class and look over the calendar for the second graph is needed. Things that for example regards the user should be gathered in the same place to avoid confusion.

Long term, tabs in the WOOF-space could be added to get a better overview and avoiding confusion for the user. Another possibility is making a beginners guide for new users. Further, hover-over information when holding the mouse over an icon or button is recommended as well as updating the navigation in insight, for example having a front page with all the different graphs creating an overview for the user and improve the usability.

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Appendices

Appendix A

Exploratory survey

The exploratory survey was made in the planning phase. Below the whole exploratory survey is shown. It can be read more about it in section 3.1.3.

Brugeroplevelse af woof

Hej Woof-brugere!

Vi er to studerende fra Lunds Universitet i Sverige, der laver vores speciale med Woof Technologies, hvor specialets mål er at evaluere brugeroplevelsen af Woof-plattformen. Med denne formular vil vi gerne vide, hvad almindelige brugere synes om de eksisterende funktioner og design, om det er nemt eller svært at bruge, og også hvad du som bruger gerne vil have forbedret.

Formularen tager kun 5 - 7 minutter at besvare og er fuldstændig anonym.

Vi er meget taknemmelige for, at du har taget dig tid til at besvare denne undersøgelse!

Alt det bedste,
Signe & Amanda

*** Anger obligatorisk spørgsmål ***

1. Hvad er dit køn? *

Markera endast en oval.

- Kvinde
 Mand
 Andet

2. Hvor gammel er du? *

Markera endast en oval.

- 18 - 24
 25 - 34
 35 - 44
 45 - 54
 55 - 64
 Over 64

3. Hvor længe har du brugt WOOF-plattformen i din klasse? *

Markera endast en oval.

- 0-3 måneder
- 4-6 måneder
- 6 måneder - 1 år

4. Hvor mange gange har du WOOFet med din klasse? (hvis du har WOOFet med flere klasser, så vælg ud fra den klasse, som du har WOOFet flest gange med). *

Markera endast en oval.

- 0 gange *Fortsätt till fråga 7*
- 1 - 4 gange *Fortsätt till fråga 5*
- 5 - 9 gange *Fortsätt till fråga 5*
- 10 eller flere gange *Fortsätt till fråga 5*

Generelt om platformen

5. Hvordan har du arbejdet med WOOF? (eks. hvor ofte I WOOFer? om I har kørt forløb? Hvordan I har brugt det i klassen? Om du har inddraget forældre eller andre lærere) *

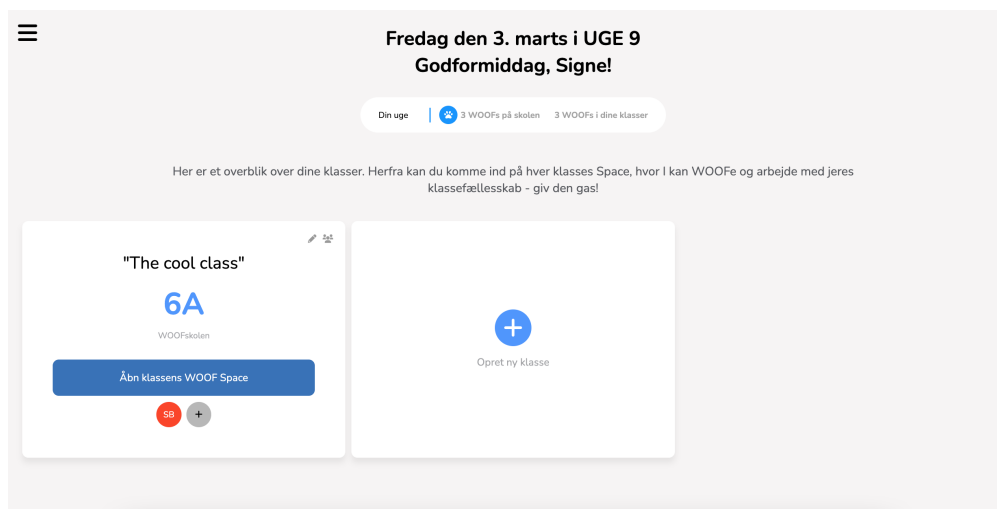
6. Hvad er din erfaring med at arbejde med WOOF-plattformen (eks. om det har gjort en forskel for klassen, om WOOF er let at arbejde med, om eleverne synes om det osv) *

Fortsätt till fråga 8

7. Hvorfor har du ikke brugt WOOF-funktionen? *

Funktioner på startskærmen

Følgende udsagn vedrører brugen af startskærmen. Se billede for reference.



8. Jeg har oprettet en klasse på startskærmen. *

Markera endast en oval.

- Ja *Fortsätt till fråga 9*
- Nej *Fortsätt till fråga 10*

9. Det er nemt at oprette en ny skoleklasse *

Markera endast en oval.

Jeg er meget uenig

1

2

3

4

5

Jeg er meget enig

10. Har du brugt funktionen "tilføj lærere"? *

Markera endast en oval.

Ja *Fortsätt till fråga 11*

Nej *Fortsätt till fråga 12*

11. Det er nemt at tilføje en lærer til en af mine klasser. *

Markera endast en oval.

Jeg er meget uenig

1

2

3

4

5

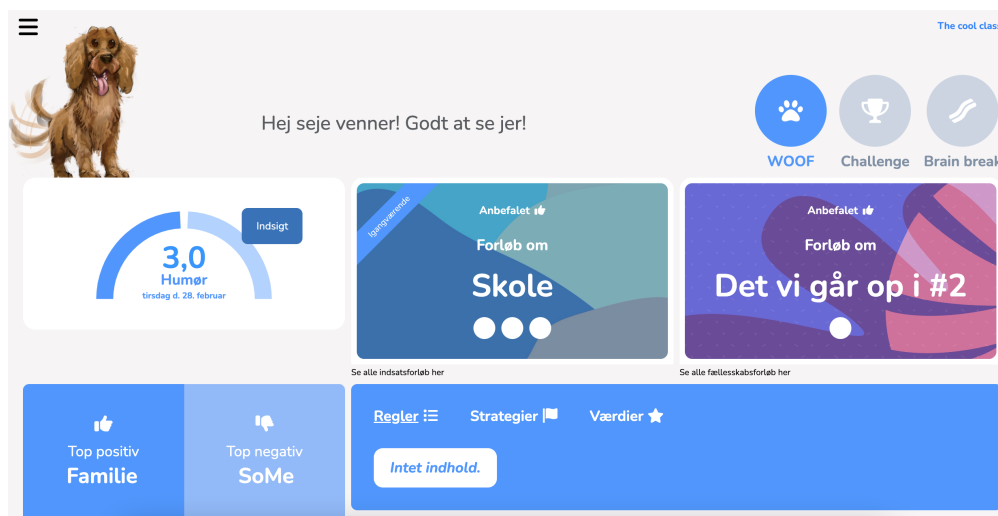
Jeg er meget enig

Med henvisning til startskærmen.

12. Er der nogen ændringer, du tror vil bidrage til lettere navigation og bedre oplevelse for startskærmen?

Reference til WOOF space.

Følgende udsagn vedrører brugen af en klasses WOOF space. Se billede for reference.



13. Har du brugt en eller flere af WOOF/Challenge/Brain break-funktionerne? *

Markera endast en oval.

- Ja Fortsätt till fråga 14
- Nej Fortsätt till fråga 16

14. Det er nemt at WOOFe. *

Markera endast en oval.

Jeg er meget uenig

1

2

3

4

5

Jeg er meget enig

15. Det er let at forstå, hvad der skal gøres for at adgang til "challenge" og "brain break". *

Markera endast en oval.

Jeg er meget uenig

1

2

3

4

5

Jeg er meget enig

16. Har du brugt funktionen Regler/Strategier/Værdier? *

Markera endast en oval.

Ja Fortsätt till fråga 17

Nej Fortsätt till fråga 18

17. Det er nemt at tilføje klassens værdier. *

Markera endast en oval.

Jeg er meget uenig

1

2

3

4

5

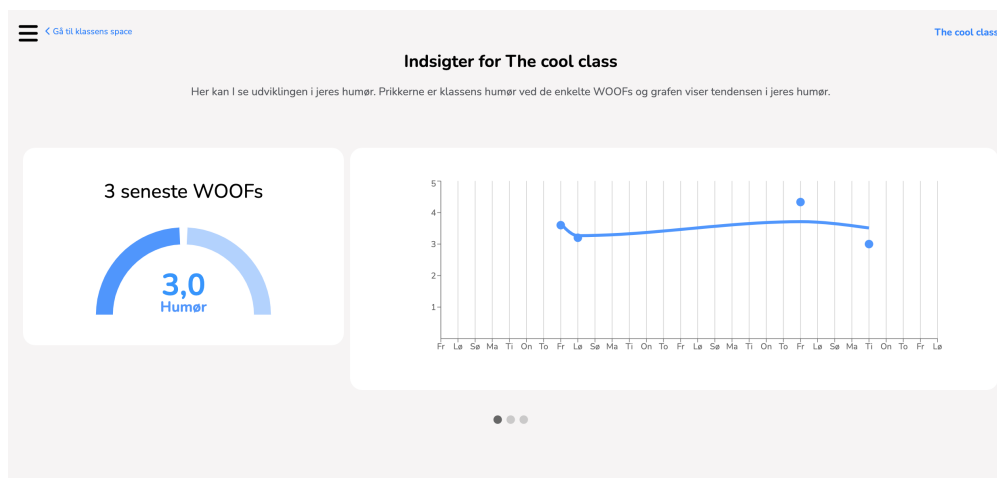
Jeg er meget enig

Med henvisning til WOOF space.

18. Er der nogen ændringer, du tror, vil bidrage til lettere navigation og bedre oplevelse for WOOF space?

"Indsig" funktionen.

Følgende udsagn vedrører brugen af indsigterne. Se billede for reference.



19. Har du brugt "indsigt"-funktionen? *

Markera endast en oval.

- Ja Fortsätt till fråga 20
- Nej Fortsätt till fråga 22

20. Det er nemt at navigere mellem de forskellige grafer. *

Markera endast en oval.

Jeg er meget uenig

1

2

3

4

5

Jeg er meget enig

21. Det er let at forstå hvad de forskellige grafer repræsenterer. *

Markera endast en oval.

Jeg er meget uenig

1

2

3

4

5

Jeg er meget enig

Med henvisning til "Indsigt"- siden.

22. Er der nogen ændringer, du tror, vil bidrage til lettere navigation og bedre oplevelse for "indsigterne"?

Dine generelle tanker.

23. Er der noget du mangler på platformen? Marker et eller flere alternativer, og kom gerne med dine egne forslag! *

Markera alla som gäller.

- At kunne slette en klasse fra startskærmen
- På alle sider en knap for at gå tilbage til forrige side
- At kunne få information om de forskellige funktioner i WOOF space
- En begynderguide til nye brugere
- Nej
- Övrigt: _____

24. Har du nogle kommentarer, du vil dele med os?

Det här innehållet har varken skapats eller godkänts av Google.

Appendix B

Background Questionnaire

The background questionnaire relates to the Hi-Fi evaluation and is presented below. This could be read more about in section 5.3.1.

Inledande frågor

* Anger obligatorisk fråga

1. Ditt testnummer? *

2. Din ålder *

Markera alla som gäller.

- < 20 år
- 20-29 år
- 30-39 år
- 40-49 år
- 50-59 år
- 60-69 år
- 70+ år

3. Kön? *

Markera alla som gäller.

- Man
- Kvinna
- Annat
- Vill ej uppge.

4. Ser du dig själv som en teknisk person *

Markera alla som gäller.

- Ja
- Nej
- Medel
- Vet ej

5. Vad jobbar du med/studerar du? *

Vi behöver ditt samtycke

Vi som genomför undersökningen är studenter som gör vårt examensarbete på Woof Technologies. Syftet med undersökningen är att utvärdera och kartlägga användarvänligheten och brister i design för en plattform som används inom skolan i Köpenhamn. Det kommer att utföras genom att du som testar kommer att få testa två olika prototyper där du kommer genomföra ett antal scenarios. Du kommer att vara anonym genom hela testet.

Under undersökningen kommer vi spela in skärmen på datorn som används. Testet är helt frivilligt att genomföra och du kan när som helst välja att avbryta ditt deltagande utan att motivera varför.

Jag godkänner att skärmen kommer att spelas in, och att insamlat material kommer användas i syfte för undersökningen. Efter avslutat examensarbete kommer allt insamlat material kastas.

6. Jag samtycker till ovanstående information. *

Markera alla som gäller.

- Ja
 Nej

Det här innehållet har varken skapats eller godkänts av Google.

Google Formulär

Appendix C

SUS Questionnaire

Below only one of the SUS Questionnaire is presented since both were exactly the same. The result of the SUS Questionnaire is presented in section 5.3.1.

SUS-enkät hifi 1 Signe

* Anger obligatorisk fråga

1. Ditt testnummer *

2. Jag tror att jag vill använda applikationen regelbundet. *

Markera endast en oval.

Instämmer inte alls

1

2

3

4

5

Instämmer helt

3. Jag tycker att applikationen är onödigt komplex. *

Markera endast en oval.

Instämmer inte alls

1

2

3

4

5

Instämmer helt

4. Jag tycker att applikationen är enkel att använda. *

Markera endast en oval.

Instämmer inte alls

1

2

3

4

5

Instämmer helt

5. Jag tycker att jag behöver stöd av någon teknisk kunnig person för att kunna använda applikationen. *

Markera endast en oval.

Instämmer inte alls

1

2

3

4

5

Instämmer helt

6. Jag tycker att de olika delarna i applikationen är välintegrerade. *

Markera endast en oval.

Instämmer inte alls

1

2

3

4

5

Instämmer helt

7. Jag tycker att det är för mycket inkonsekvens i applikationen. *

Markera endast en oval.

Instämmer inte alls

1

2

3

4

5

Instämmer helt

8. Jag tror att de flesta snabbt skulle lära sig denna applikation. *

Markera endast en oval.

Instämmer inte alls

1

2

3

4

5

Instämmer helt

9. Jag tycker att applikationen är besvärlig att använda. *

Markera endast en oval.

Instämmer inte alls

1

2

3

4

5

Instämmer helt

10. Jag känner mig trygg i att använda applikationen. *

Markera endast en oval.

Instämmer inte alls

1

2

3

4

5

Instämmer helt

11. Jag kommer att behöva lära mig många nya saker innan jag blir produktiv med denna applikation. *

Markera endast en oval.

Instämmer inte alls

1

2

3

4

5

Instämmer helt

Det här innehållet har varken skapats eller godkänts av Google.

Google Formulär

Appendix D

Semi Structure Interview

The Semi Structure Interview is presented below. The result can be read in section 5.3.4.

1. Vad är dina spontana tankar efter att ha genomfört testerna?
2. Vad var svårast med respektive prototyp?
3. Vad var enklast med respektive prototyp?
4. Fanns det någon funktion du tyckte mycket om?
5. Behövs det mer feedback eller information till användaren?
6. Vilken av prototyperna föredrar du?

