LISANNE DE JONGE
FINAL BACHELOR PROJECT

BABBELBORD
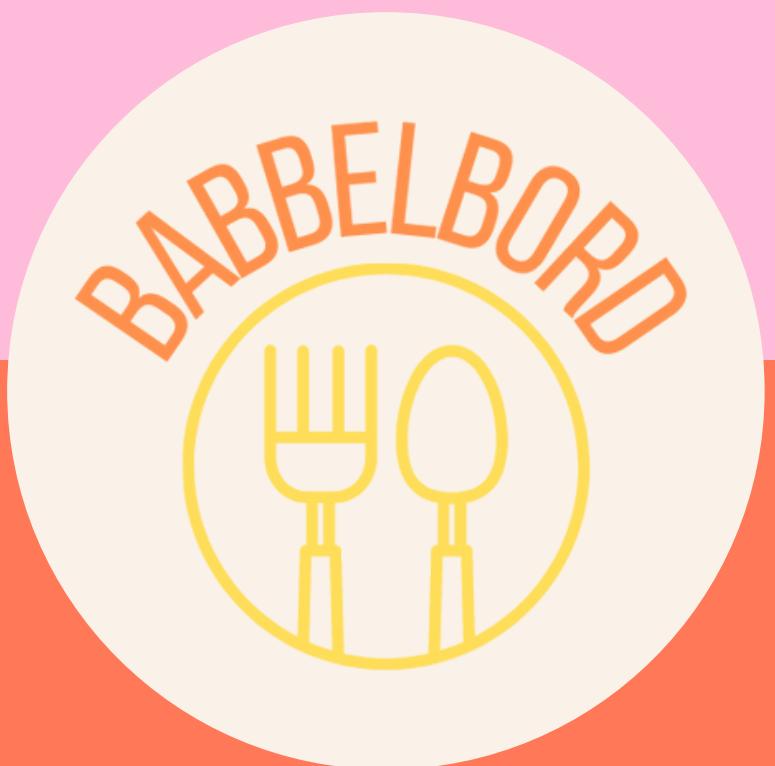
BABBELBORD
IMPLEMENTING INTUITIVE EATING INTO DAILY LIFE THROUGH A MEAL

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FOREWORD

This Final Bachelor report aims to create more awareness of the new health, mind, and body approach, called Intuitive Eating. There are a ton of diet and diet apps, all creating guilt towards people when they fail the diet or diet app plan.

Nowadays not only diets and diet apps, but also social media influence our perspective on how the human body looks and how humans should behave around food. This influence not only creates negative body images but also fosters unhealthy eating and exercise habits.

Present-day society created a perfect picture that people should work out by doing one-hour sweaty cardio exercises, like cycling or running and that people should go to the gym. If someone does not sweat or experience muscle soreness the day after a workout, it is considered inadequate. Social media and societal expectations also shape eating habits. They often portray images of consuming primarily vegetables, fruits, and protein sources like soy, while suggesting minimizing carbohydrate intake. However, carbohydrates are essential for providing energy, particularly for fuelling intense workouts.

I had this image as well

These accumulations of "perfect pictures" create mental diseases like anorexia, orthorexia, and bulimia, but also eating habits like binge eating and diseases like obesity. All because people are not happy with their bodies, because of the comparison with other people. The word other says it all, it is someone else, not you, you should not compare yourself with them, everything inside you is different, your DNA, family, character, etc.

Finally, there is a new mind, body, and health approach that aims to bring people back to their natural eating habits from infancy. During that period, individuals ate when they craved something and only consumed what they desired at that moment. This approach incorporates some nutrition knowledge to understand which macronutrients promote satiety and fuel for exercises, among other things. It not only helps restore body positivity but also allows individuals to explore and discover the types of exercise they genuinely enjoy.

There is limited knowledge about this approach in the Netherlands, something I aim to address through this report.

Happy reading!
Lisanne de Jonge

ABSTRACT
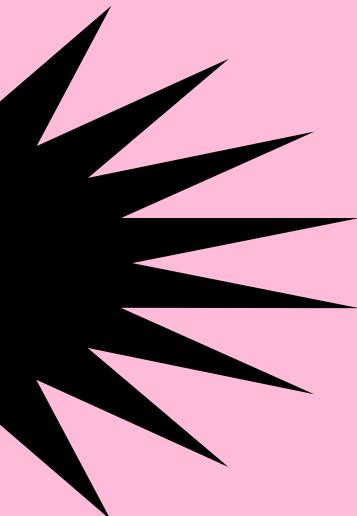
Intuitive Eating is a mind, body and health approach created in 1990. Its goal is to promote body positivity, help individuals discover their preferred types of exercise, reconnect with their hunger cues, and develop a better understanding of nutritious foods to support overall well-being.

This study has created a new way to learn to use intuitive eating in your daily life. While there are existing resources such as a book and workbook, this study proposes the creation of a placemat and plate with a built-in display. This innovative product aims to enhance the understanding and application of intuitive eating concepts in real-life scenarios. The display generates at the start, in the middle and at the end of the meal a randomly chosen sentence. Sentences based on the Intuitive Eating book by Evelyn Tribole and Elyse Resch (2020). By answering these questions, users can develop a deeper connection with their body's cues, ultimately helping them incorporate this knowledge into their daily routines.

The study initially developed a low-fidelity prototype of the product, followed by a survey to gather feedback on its appearance and functionality. Based on the survey results, the prototype was further evaluated, leading to the creation of an improved version. The survey responses indicated that the prototype's sentences were clear, and users found it easy to understand how to use the product in their daily lives. The final prototype is creating more awareness of intuitive eating.

INTRODUCTION

Since 2012, there is a mind-body health approach called Intuitive Eating. This method consists of ten principles created by Tribole & Resch (2020). It is not a diet that requires calorie tracking or imposes restrictions on food choices and exercise quantity. Instead, it focuses on respecting your body at any size, rediscovering your innate hunger signals from infancy, understanding the nutrition of food, and exploring the types of movement that you genuinely enjoy. Intuitive Eating has been found to improve body image (Linardon et al., 2021), reduce disordered eating behaviours (Hazzard et al., 2021; Tylka, 2006), promote long-term health (Bacon et al., 2005), and reduce weight cycling (Tylka et al., 2020). There have been more than 125 studies conducted on intuitive eating, and the number continues to grow (Tribole & Resch, 2020). Unlike traditional diets, Intuitive Eating takes into account physiological factors that are often overlooked (Singh, 2014).

I have designed a conscious eating plate and placemat. In the plate and placemat there is an extra feature added, a display. At the beginning, middle and end of your meal, a random sentence appears on the display. With sentences to help you eat more consciously. The questions are based on the principles of Intuitive Eating from Resch and Tribole (2020).

With this idea, I want to help non-intuitive eaters from 18 to 80 years old, more easily understand their hunger, satiety and fullness cues. The idea is in Dutch as there is less material about Intuitive Eating in Dutch. Currently, there is a book and workbook (Tribole & Resch, 2020), but hands-on learning tends to be more effective than relying solely on reading materials (Kirschner et al., 2000; Tribole & Resch, 2020; Fiorella & Mayer, 2014). The goal of the plate is to assist Dutch individuals who are not yet practising intuitive eating in adopting this approach, helping them reconnect with their hunger, satiety, and fullness cues by reflecting on their eating behaviour during meals. This is important because intuitive eating promotes long-term health. The central question of this report is: How can we make intuitive eating easy to implement in daily life?

The research process started with brainstorming, followed by prototyping and validation through a survey. Subsequently, another round of prototyping, user testing, and a survey were conducted to refine the design of the plate and placemat, leading to the final product.

This research has provided me with valuable knowledge and skills, including programming an OLED display with an Arduino, manufacturing the display on a plate and placemat, collecting user information, and effectively incorporating feedback to improve the prototype. I learned from making a user manual how this product could be made into a real package that could be sold. Through the process of developing numerous prototypes and designing the report, I have acquired new skills across various areas of expertise (TU/E - Technische Universiteit Eindhoven, n.d.), which will be beneficial for my future studies in the master's program in Industrial Design.

The structure of this report begins with a background section that provides contextual information on dieting, exercise, and intuitive eating research. This is followed by a description of the research methodology to outline the process undertaken. After this, a position in context is written to make clear what the benefits of the product could be. Making this more convincing by the results and the findings. Finalizing the report with a discussion and a conclusion.

BACKGROUND

Nowadays, health and body image plays a significant role in society, and social media has both positive and negative impacts in this regard. On the positive side, social media can showcase body positivity, inspirational stories, and serve as a supportive community for people to connect. However, on the negative side, social media can also contribute to unhealthy body image (Tiggermann et al., 2013) and unrealistic beauty standards (Kross et al., 2013; Brailovskaia et al., 2021) contributing to eating disorders like Anorexia nervosa and more (Fardouly et al., 2015; Perloff et al., 2016; Sidani et al., 2016; Shisslak & Crago, 1995). The amount of people with an eating disorder has more than doubled from the 2000-2006 period to the 2013-2018 period, from 3.5 per cent to nearly 8 per cent (Galmiche et al., 2019).

In addition to anorexia nervosa (Levinson et al., 2017; Eikey & Reddy, 2017), orthorexia is also a condition that can develop. Individuals with orthorexia strive to appear as "perfect" eaters, but in reality, they are obsessed with healthy eating and fitness, often resorting to methods like counting macros. However, this obsession poses risks of malnutrition, social isolation, and decreased quality of life (Tribole & Resch, 2020; Bratman, 2017). Although orthorexia is not officially recognized as an eating disorder, it is important to raise awareness and understanding about the risks it entails. For individuals with orthorexia, their pride and identity are intertwined with their eating habits, making it challenging to break free from this behaviour.

"I HAVE TO EXERCISE FOR ONE HOUR AND BE SWEATY AFTERWARDS, OTHERWISE I CAN'T COUNT IT AS EXERCISING." THOUGHT FROM ME A FEW YEARS AGO

Due to reasons like body dissatisfaction (Baker et al., 2019), health concerns or social pressure (Juarascio et al., 2011) people go on a diet. The global weight loss and weight management market was valued at $245.51 billion in 2019, and it is expected to grow at a compound annual growth rate (CAGR) of 8.3% from 2020 to 2027 (Grand View Research, 2019). According to a report from the World Health Organization (WHO) published in 2016, global obesity rates have more than doubled since 1980 (World Health Organization, 2016). This indicates a significant number of individuals interested in managing their weight and improving their health through methods such as dieting or lifestyle changes.

But why do we worship those diets? According to Christy Harrison (2018), a certified intuitive eating Counsellor and podcast host "Diet culture has become a system of beliefs that:
- Worships thinness and equates it to health and moral virtue.
- Promotes weight loss as a means of attaining higher status.
- Demonizes certain ways of eating while evaluating others.
- Oppresses people who do not match up with its supposed picture of "health"."

"IRONICALLY, WE SEEM TO HAVE MORE RESPECT FOR OUR CARS THAN FOR OURSELVES. IF YOU TOOK YOUR CAR TO AN AUTO MECHANIC FOR REGULAR TUNE-UPS, AND AFTER TIME AND MONEY SPENT THE CAR DIDN'T WORK, YOU WOULDN'T BLAME YOURSELF. YET IN SPITE OF THE FACT THAT UP TO 95 PERCENT OF ALL DIETS FAIL, YOU TEND TO BLAME YOURSELF, NOT THE DIET! ISN'T IT IRONIC THAT WITH A MASSIVE FAILURE RATE FOR DIETING WE DON'T BLAME THE PROCESS OF DIETING?", WRITTEN BY RESCH AND TRIBOLE (2020).

Are those diets effective and healthy? Weight cycling from dieting has even a higher overall death rate and twice the normal risk of dying of heart disease (Lissner et al., 1991). Why are we still using those diets as there are more and more reports showing the opposite which is that diets are one of the strongest predictors of weight gain regardless of the actual body weight of the dieter (O'Hara &Taylor, 2018). Doctors and dietitians continue to prescribe diets despite the fact that dieting is not sustainable in the long run (Mann et al., 2007; Field et al., 2003; Pietilainen et al., 2011) and can even cause harm (Neumark-Sztainer et al., 2006; Messner et al., 2018), such as increased stress (McEwen, 2008). Dieting leading to regaining weight instead of weight loss and not providing the health improvements dieting implies to do (Vickers et al., 2007).

For example, a study about the Biggest Loser show contestants found that six years later, their metabolism was reduced by an average calorie of 700 per day and even worse, their muscle mass was lower than their baseline by over then pounds (Fothergill et al., 2016). Meaning that their body uses its own body mass to compensate for the loss of energy due to their low metabolism (Nelson & Cox, 2017).

"IMAGINE, FOR EXAMPLE, TAKING AN ASTHMA MEDICATION THAT IMPROVES YOUR BREATHING FOR A FEW WEEKS, BUT IN THE LONG RUN CAUSES REBOUND ASTHMA ATTACKS AND ULTIMATELY DAMAGES YOUR LUNGS. WOULD YOU BLAME YOURSELF FOR THE MEDICATION NOT WORKING, YET STILL CONTINUE TO TAKE IT? OF COURSE NOT! THAT'S WHAT THE PROCESS OF DIETING IS LIKE, EVEN IF YOUR HEALTHCARE PROFESSIONAL PRESCRIBES IT." QUOTED FROM RESCH AND TRIBOLE (2020).

In the Dieter's dilemma you can see the vicious cycle dieters are going through, figure 1.

DIETER'S DILEMMA

DESIRE TO BE THIN

DIETING

REGAIN OF LOST WEIGHT

CRAVINGS & REDUCED SELF-CONTROL

LOSS OF CONTROL & OVEREATING
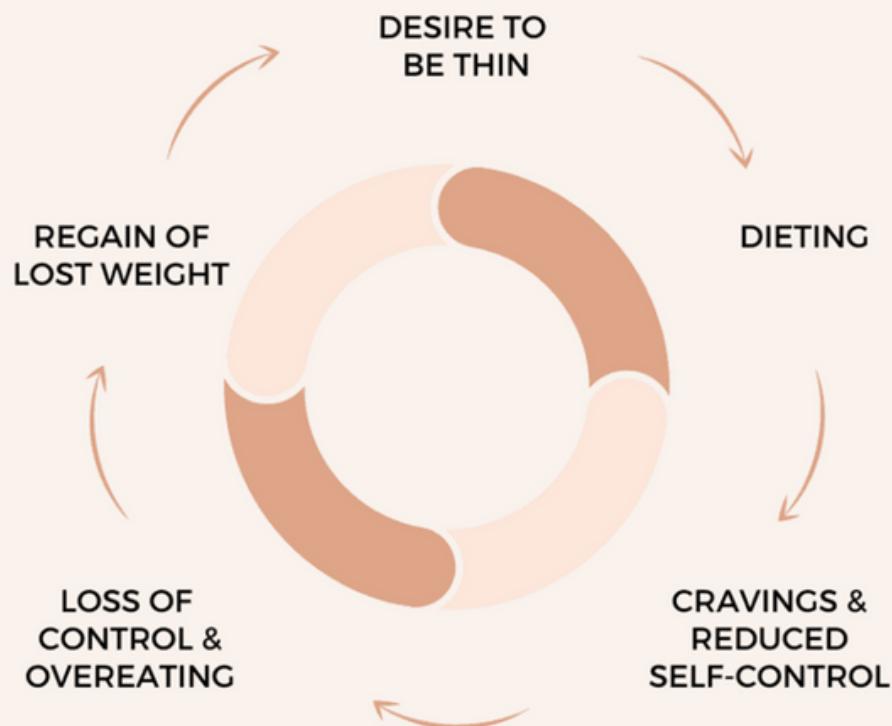
LINDSAYPLESKOT.COM

Figure 1, (Rd, 2020)

To break this circle and to break our old paradigm we should shift our paradigm according to Stephen Covey (2004). Paradigm means a model of something (paradigm, 2023). To shift the concept paradigm to diets and its weight management, dieting is the cultural paradigm, and we try to control our weights by this. To break this barrier, we should shift our old mindset and embrace a new paradigm that promotes a healthy relationship with food and our bodies, where healthcare is not solely focused on weight (Hunger & Tomiyama, 2020). Because people can both be fat and healthy, fat is not always an indicator (Nuttall, 2015). Concentrating on weight and BMI does not predict someone's health (Tomiyama et al., 2016; Tomiyama et al., 2018).

Constantly denying our hunger cues makes it almost impossible to listen to them (Polivy & Herman, 1999; Tribole & Resch, 2020). Restriction also leads to wanting the product even more (Keeler et al., 2015). A study showed that children not allowed to eat the red M&M's were eating the most.... red ones (Semmelweis, 1861).

We try to improve our diet culture by suggesting that there should be a holistic approach that includes both dietary and policy interventions to address cardiovascular disease, diabetes, and obesity (Mozaffarian, 2016). But to really solve the problems dieting gives, we should start intuitive eating. Intuitive eating is about eating to your hunger cues and eating whatever you choose is satisfying, without having guilt or ethical dilemmas when eating (Tribole & Resch, 2020). It is an inside job, where you must listen to the messages coming from inside. Being scared that intuitive eating will free your craving for pizza every single dinner is not necessary. Food habituation makes sure you get a decrease in behavioral and psychological response, so you do not want it every single dinner (Ernst, 2002; Epstein, 2009). It is called sensory-specific satiety (Smit, 2015).

Going through every single principle of intuitive eating helps to get the inner body cues back and your respect towards your body, getting you authentic health, see figure 2. Of course, it will take some time, but how much time and money did you waste on diets?

Intuitive eating emphasizes the importance of being fully present and focused during meals. It discourages paired eating, which involves engaging in other activities, such as watching TV, while eating (Tribole & Resch, 2020). Paired eating often leads to faster eating, increased food intake, and a decreased sense of fullness (Oldham-Cooper et al., 2011).

Research has demonstrated that intuitive eating is more effective in promoting long-term health compared to restrictive dieting (Bacon et al., 2005). This is attributed to greater weight stability achieved through intuitive eating practices (Tylka et al., 2020). Furthermore, intuitive eating has been found to have positive psychological effects, including reduced psychological distress (Homan & Tylka, 2018; Augustus-Horvath & Tylka, 2011; 90) and improved disordered eating behaviours, particularly binge eating (Hazzard et al., 2021), which often arise from diet culture. Intuitive eating helps individuals develop a positive body image, enhance self-esteem, and promote overall well-being (Linardon et al., 2021). It is an approach that can benefit individuals of any gender, ethnicity, culture, age, or weight category (Bruce & Ricciardelli, 2016). It is important to note that intuitive eating does not solely focus on eating whatever one desires but also emphasizes the incorporation of nutrition. well.

"JUST AS A PERSON WITH A SHOE SIZE OF EIGHT WOULD NOT EXPECT REALISTICALLY SQUEEZE INTO A SIZE SIX, IT IS EQUALLY FUTILE (AND UNCOMFORTABLE) TO HAVE THE SAME EXPECTATION ABOUT BODY SIZE."
(TRIBOLE & RESCH, 2020)

Intuitive Eating: the Dynamic Integration
of Inner Attunement &Health Values
to Achieve Authentic Health

Inner Attunement — Authentic Health — External Health Values

Figure 2, (Lawson, 2017)

10 PRINCIPLES OF INTUITIVE EATING

1.REJECT THE DIET MENTALITY

It is about stopping the diet apps you are using and stopping reading the articles about diets that only give you feelings of guilt.

2. HONOR YOUR HUNGER

Just eat whenever you feel a bit of hunger or when the normal mealtimes are, do not hesitate with eating carbs and overall make sure your body is getting enough fuel.

3. MAKE PEACE WITH FOOD

It is about stopping the diet apps you are using and stopping reading the articles about diets that only give you feelings of guilt.

4. CHALLENGE THE FOOD POLICE

Try to stop the thoughts with diet rules, rules like 'this is a "good" food because it has a low amount of calories'.

5. DISCOVER THE SATISFACTION FACTOR

Notice what you eat, where, and with whom you are eating and experience the satisfying factor at that moment.

6. FEEL YOUR FULLNESS

Feel when you are hungry and when you are full.

7. COPE WITH YOUR EMOTIONS WITH KINDNESS

Find out when you are eating to cope with your emotions.

8. RESPECT YOUR BODY

Accept your genetics and the body it creates. Respect your body. Likewise, you cannot change your shoe size or body length.

9. MOVEMENT FEEL THE DIFFERENCE

Just get some movement instead of making to the gym a must. Just feel how your body reacts to the movement, like energized perhaps.

10. HONOR YOUR HEALTH – GENTLE NUTRITION

Make food choices that honor your satisfying factor and your taste buds, but also make choices that keep you full, makes you feel good and keep you healthy.

METHOD

In this research, multiple methods were employed to develop the final prototype based on the health, mind, and body approach of Tribole and Resch (2020). The process began with a brainstorming session to generate initial ideas related to nutrition and health. The most promising ideas were then transformed into low-fidelity prototypes to assess their real-life feasibility. In the meantime, companies and dietitians were emailed. An interview with Daisy O'Neill a PhD student researching females in cardiac rehabilitation with an app based on intuitive eating gave insights into what a project about intuitive eating could look like. A consent form and ERB form were made. Two ideas remained, an intuitive eating game and a plate with a display. A survey was conducted to gather feedback specifically on the intuitive eating game idea (see Appendix A). Additionally, responses were received from Marijke Kneepkens, a dietitian and nutritionist, and Annemarie van Elburg, a psychiatrist and eating disorders teacher. Their interest in the plate concept, combined with the survey results, led to the decision to proceed with the plate with a display as the chosen prototype. Using an Arduino UNO and an OLED display, the plate with a display prototype was developed. After this, the user test could begin. A variation on the plate with a display was made to look at the possibilities of an extra sensor. The final stages of the project involved refining and finalizing the prototype.

Brainstorming

The brainstorming process involved several steps, including clarifying, ideating, developing, and implementing (Rudy, 2020). Clarifying the scope of the project involved narrowing down the broad topic of health to focus specifically on nutrition and physical activity. Narrowing it by having the goal to get people with overweight, obese or have an eating disorder healthier. With questions like 'How can we improve people their health?' and 'What type of daily task could be improved and give better health?'. With this information, sketches were made, see figures three and four.

Plate asking you questions about the food of your meal

App that tells you where you can buy the cheapest fruit + gives receipe

Toothbrush which gives a notification to switch hand → gives will power

Refrigerator that asks what you want to eat

Drawer that places "unhealthy" at the back

Stove which tells you how you can complete your meal in terms of nutrients

App that walks you through the day, to see what went well and what not, to stick with the good things

Black calender that gives you a challenge every day. A reflection challenge that makes you implement your reflection in your daily life.

On the ceiling a reflection question of the day. In the morning a strong point to focus on.

Painting with your goal, which becomes blurry when your not reaching it.

Figure 3

Function in app for people with a eating disorder → to get to intuitive eating (with Voedingscentrum)

Game to get parents and child to understand social media to prevent eating disorders

The book Intuitive Eating in a app

Function in smartwatch that tells you that you are exercising to much + that you should eat

Mirror with app that lets you reflect on your self-image and challenges you to improve it.

App that notifies you when eating too little

Backpack that checks if you eat enough and if you have enough water with you

Game which you play in phases on the steps of the Intuitive Eating book

Cardgame with every day a challenge

A sign where you can show which emotion your feeling → which will be gathered in an app

Diary which translates your writtings into data which gives you feedback back

Figure 4

15

Protyping

In the research, two low-fidelity prototypes were created to explore the ideas further (appendix B). The game prototype existed out of eight mini-games based on the 10 principles of intuitive eating (Tribole & Resch, 2020). See appendix A for a detailed explanation of every mini-game. As the plate was part of one of the mini-games, the two separate ideas were made into one, the Intuitive Eating Game.

Figure 5

Figure 6

Survey

A Microsoft Forms survey to show the looks and working of the Intuitive Eating Game was made, see appendix A for all the questions and appendix G and H for the consent form and ERB form. These questions were about the working of the prototype if it was easy to understand and if they thought it could help the target group (Dutch people from 18-80 years old). See the Results section for the whole explanation of the outcome and the analysis. But in the end, after analyzing the answers the survey showed that the game was a nice idea. Some thought it could be simpler and less time-consuming, but the goal of the idea was good and there was no extra reward necessary next to the reward you get from finishing all the mini-games. As the survey participants wanted it simpler and less time-consuming and due to dietitian and nutritionist Marijke Kneepkens and psychiatrist and teacher eating disorders Annemarie van Elburg the plate was used for further research.

Programming

To create the prototype of the plate with display a programming example was found to build on (Santos & Santos, 2023) and the electronica was bought. An Arduino UNO and a 0.96-inch OLED Display 128*64 pixels blauw - I2C where needed. Assembling this together, installing the adafruit.ssd1306.h and adafruit.GFX.h library let the display work. For this project, the example had to be adjusted into sentences randomly chosen that were at the start, middle and end of a meal, see appendix C for the full code. The display was taped to a square plate to get the looks and working better explained during the user test, see figures seven and eight for the pictures of the looks.
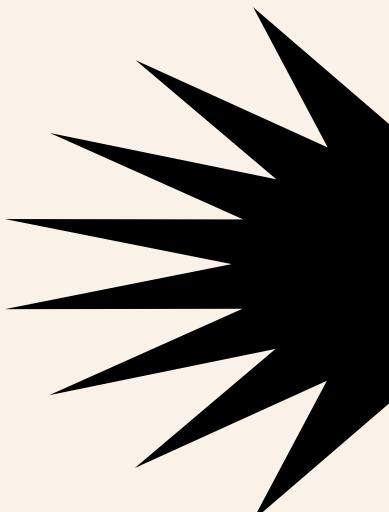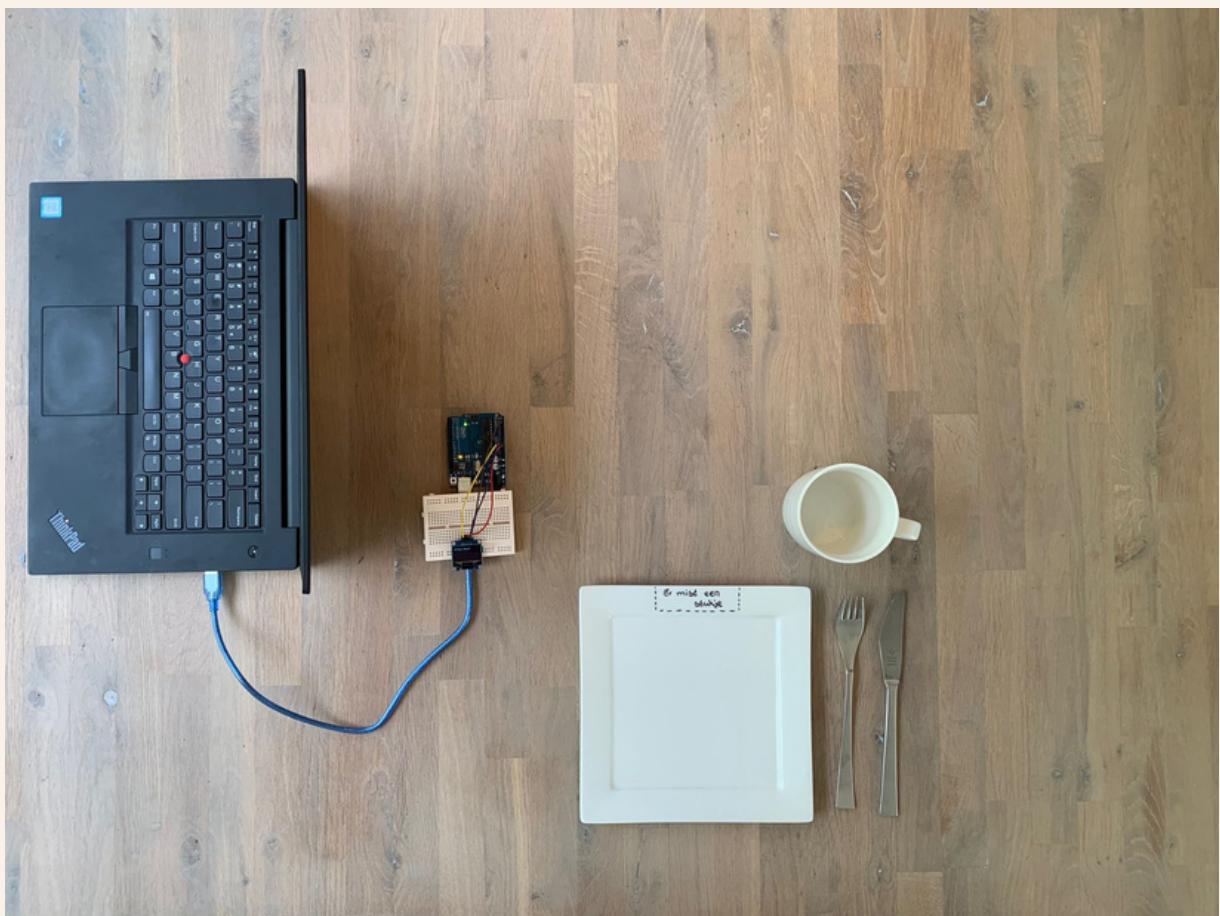
Figure 7
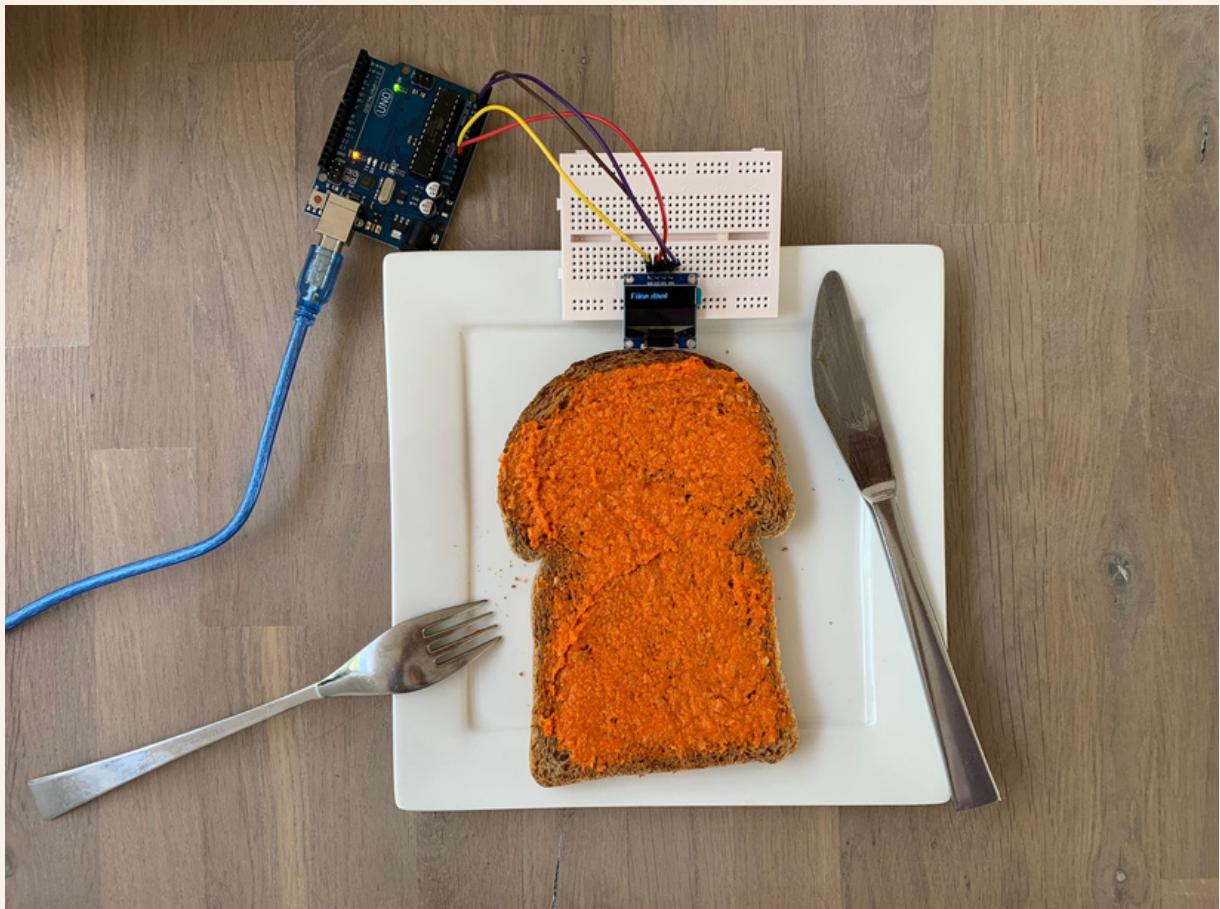
Figure 8

User test

At the start of the user test, a little introduction was given about how the user test would look like. The user test existed out of placing food on the plate, and then sticking the display on the plate. After this the programming started by the researcher and, on the display, an introduction picture and a 'eetsmakkelijk' ('enjoy your meal') word appeared. Then the randomly chosen start sentence appeared for 40 seconds, the participants read it, watched a bit, and then started to eat. After this sentence, the display was blank for 30 seconds after which the middle of the meal random sentence appeared for 40 seconds. Then the display was blank again for 40 seconds and at the end after the meal random sentence appeared on the display for 30 seconds. This was finalized by a 'fijne dag' ('have a nice day') sentence on the screen. To minimize bias, participants were not familiar with the sentences beforehand and were unaware of the duration of each sentence. Participants were encouraged to consume their usual type of food during their regular mealtime to replicate a more realistic experience. The selected participants, chosen intentionally, were two Dutch males (aged 18-25 and 55-60) and three Dutch females (aged 18-25, 45-50, and 55-60) to provide a range of perspectives.

Survey

After the user test, the participants had to fill in a survey to evaluate what they thought about the prototype. The questions (appendix D) were about the global working of the prototype. The survey results were analyzed and indicated that the prototype's functionality and appearance were suitable for daily use.

Protoyping

The user test gave the insight that people could eat at different speeds. That is why there was chosen to make two more finalized prototypes for Demoday. A placemat with a display, see figure nine and a clip with a display, see figure ten. The display worked in both prototypes in the same way. The placemat had the display built in. And could have a weight sensor in the middle underneath the plate. This sensor could adjust the sentence appearing speed due to the measured weight of the plate at the start. The clip could be clicked onto a plate of choice and used with every meal and easily be taken with. For the clip, there should be an average time for the sentence appearance or could have a button to start the next sentence for more participation from the user.

Figure 9
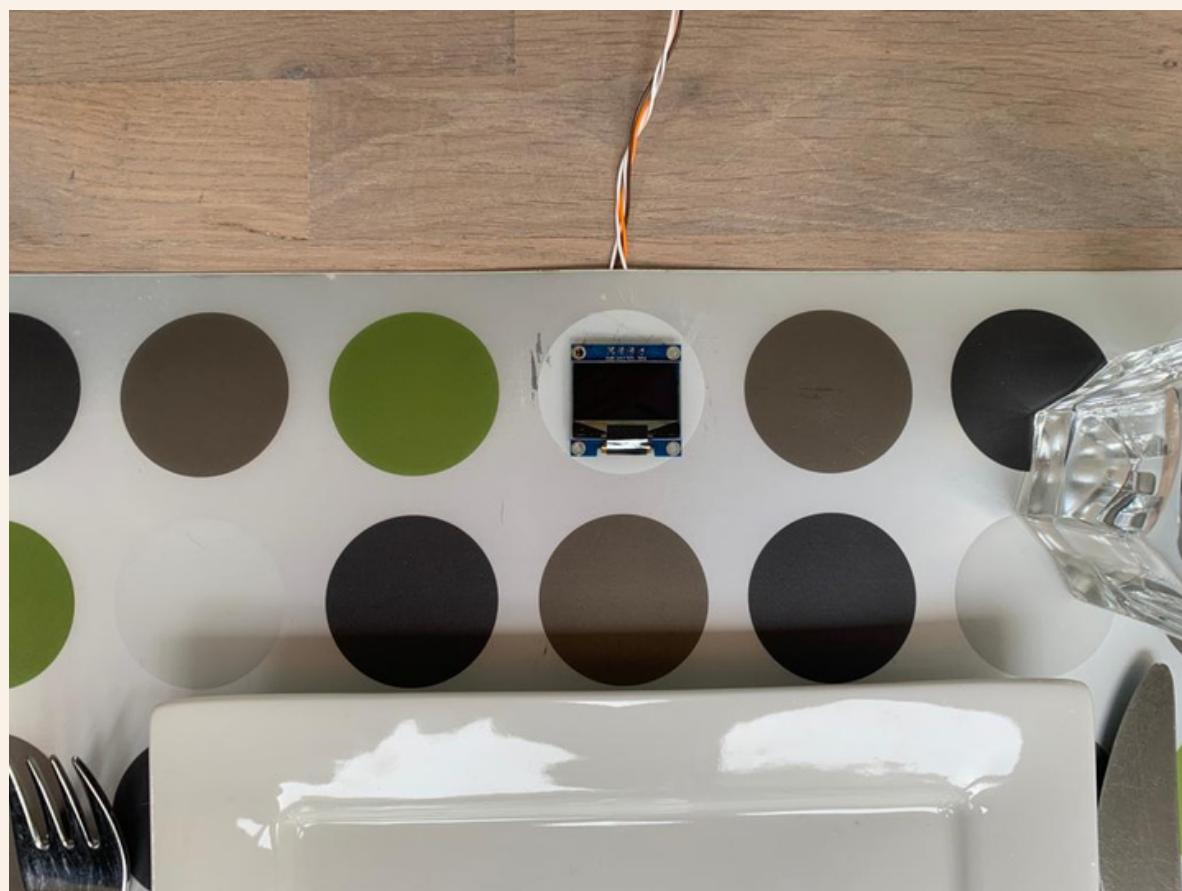
Figure 10

Manual

Making the prototypes more of a package, a manual and a video were made (appendix E and F). In the manual, an introduction of the product was written, a how-to-use page, a cleaning page and a where to find more information ending page. The manual had the logo on it, Babbelbord which was specially created for this. With two colours, orange and yellow as they are more appealing for dining time (Kleurenpsychologie in De Keuken | Interno.nl, 2022).

Demoday

Demo day showed that the idea is good, and most people liked the portable clip. But I should elaborate more on the process of the sentences. How are the sentences built, how is theory made into design? The sentences are all based on the Intuitive Eating book and workbook of Tribole & Resch (2020) and on the workbook of Christensen & SociEATy (2021). Some questions now are more global and some more about details on the plate or about inner cues. There could be made more sentences by looking into chapters 5 and 6 of the workbook (Tribole & Resch, 2020). As the questions arising in those chapters can be used or only have to be adjusted to the display size which is now 39 characters long. Here is a list of the created sentences for this prototype;

- How does your plate look?
- Which colours are in there?
- Which part looks most appealing?
- What is the structure of the food like?
- How does it smell?
- How are the spices?
- Are their spices used in the dish?
- Would you add more spices next time?
- Which colour of the food is most appealing?
- Was something less appetizing than expected?
- Does the food still taste as tasty as at the start?
- What was the best part of the plate?
- Are you feeling full?
- How would you rate your fullness?
- How do you feel?
- Are you hungry?
- Are you satisfied from this meal?
- How would you rate your hunger on a scale from 1-10, with 1 ravenously hungry and 10 over full?
- Take a break
- Take a sip of your drink
- Would you make or eat this again?

I have chosen those types of user tests and research methods as I thought those were best suited and would give the best results for creating a final prototype. With the user test, I was able to get a global idea of the working was easy to understand and with the surveys, I created a way to get easier more responses. By prototyping the working was made clearer.

THIS PROTOTYPE WAS MADE TO HELP PEOPLE NOT EATING INTUITIVELY GET IN TUNE WITH THEIR INNER BODY, THEIR MIND, AND THEIR PHYSICAL MOVEMENT. THIS IS TO HELP PEOPLE GET HEALTHIER IN THE LONG TERM. THIS RESEARCH IS TO HELP PEOPLE GET MORE KNOWLEDGE IN THIS AREA. THE PROTOTYPE HELPS TO GET A BETTER UNDERSTANDING OF INTUITIVE EATING IN DAILY LIFE INSTEAD OF THE ALREADY EXISTING READINGS.
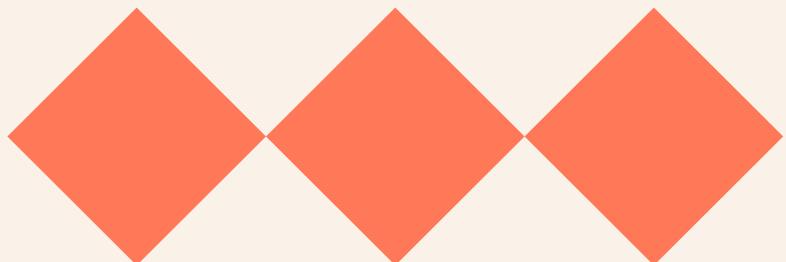
RESULTS
SURVEY 1

See appendix A for the whole survey.

1. RESPONDENTS

54 people

2. COUNTRY OF BIRTH

52 from the Netherlands
2 from another country

3. GENDER

34 women
18 men

4. AGE CATEGORY

18-24 jaar	14
25-29 jaar	5
30-34 jaar	3
35-39 jaar	1
40-44 jaar	0
45-49 jaar	6
50-54 jaar	8
55-59 jaar	8
60-64 jaar	6
65+ jaar	1
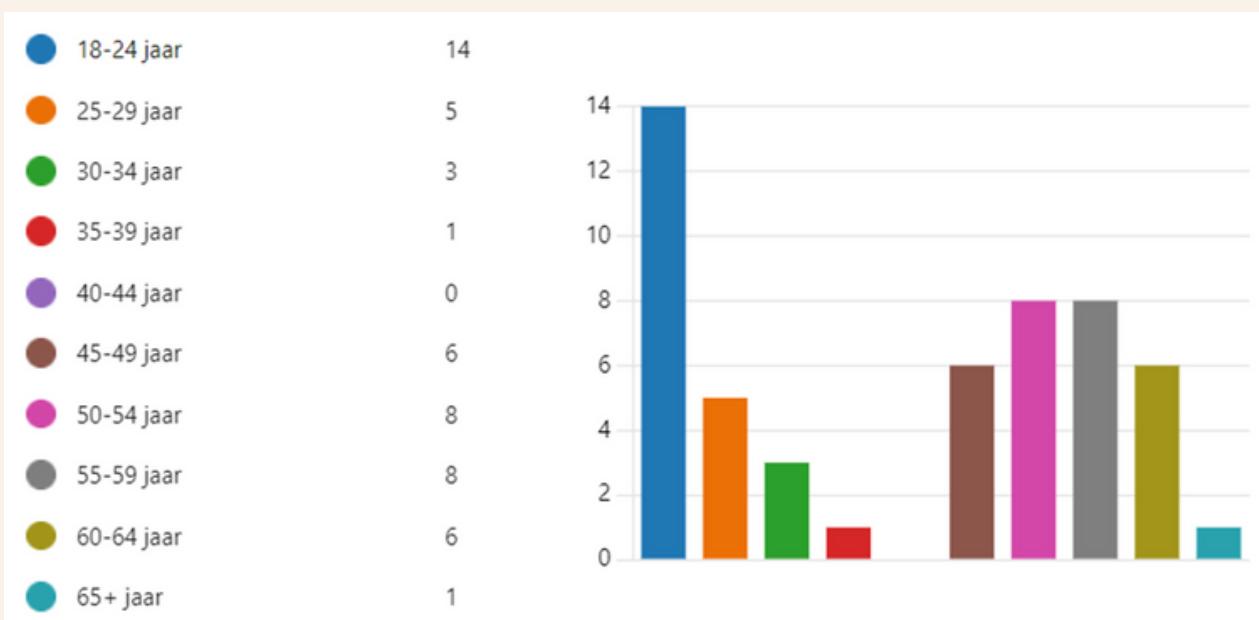
5. DIET HISTORY

17 people from the 54 people has been on multiple diets and 28 had never done a diet, whereas seven had done one diet. According to statistics from the TNS NIPO (Redactie, 2016) almost half of the people in the Netherlands are dieting. This is in common with the data gathered, as 24 people from the 54 had done at least one diet, almost half of the survey people.

6. KNOWLEDGE ABOUT INTUITIVE EATING

6 people knew and used IE
6 people knew, did not use IE
That is why this paper is created, to get more awareness for the method in the Netherlands.

7/8. WOULD YOU USE THE GAME?

12 people would use it
25 people doubted it
32 recommended the game
This could mean that the people filling in the questionnaire were not struggling with body image, food habits and dieting and that friends of them are. Which makes them want to recommend it to friends or family who are struggling.

9. SHOULD THEIR BE A REWARD?

The biggest group did not find it necessary to add a reward. Summarizing the answers gives a conclusion that getting yourself doing the game and finishing the game which means having a healthy mind and body relationship is a reward on its own.

'Think that getting the satisfaction out of it already counts as a reward'

'Recognizing the underlying idea is enough in itself'

'Participating is satisfying'

11/12/13. TIPS AND TOPS

To gather feedback on the game and identify its strengths, the question asked was: "What do you like about the product?" 52 people responded to this question, 48 of which were positive. People liked that it was **innovative**, something which **changes your perspective on food** in an effective way by making you conscious of your food habits. The game exists out of a lot of mini-games, something that could be overwhelming but due to distributing the mini-games over weeks or months it is more **manageable**. Regarding the question "What do you dislike about the product?", 30 respondents provided suggestions for improvement. The game was now **too straightforward**. Some of the aspects of the mini-game were not enough to really understand what surfs you and what not. Like mini game five, principle seven, Cope with your emotions, it **did not show the value** if you cope with your emotions in another way than eating. Another point, people with an eating disorder could be **triggered** by the thought that they cannot go further to the next mini-game because they did not finish the last one, but it was too hard so they cannot get further, meaning they are stuck. That is why (Facebook, n.d.) a Belgian Dietitian from the Facebook group Intuïtief Eten suggested thinking about which target group should be used for the game. The game has not clearly stated what the purpose of the game is, this could be included in a manual for example. A few people also mentioned that there are too many rules and too many mini-games which takes **a lot of time**. After this feedback people gave the game a **3.56 on average** from the five stars they could rate it.

14. SHOULD THEIR BE AN EXTRA REMINDER?

32 people said YES
To a phone background that grows like a tree or flower

16/17. SHOULD MINI GAME FOUR BE A OWN GAME?

4 NO
2 YES
They thought an improvement on mini-game four would be to lighten up the edges of the screen where the sentence appears. Unfortunately, there were only six answers to these two extra questions. Which makes it less reliable.

The conclusion of the answers from the survey is the mini-game should be shorter, simpler, and catchier. An instruction manual or video should be made for beginning the game. Because of the intrinsic value the game gives, there is no further need for a reward. But to help the player remind playing the game there should be an extra created, like a telephone background that grows while playing. The target group will be people from 18 to 80 with dieting experience because those people have the greatest opportunity to benefit from the game as those people could be having eating rules. The target group includes people with an eating disorder, although this game is best played for those people together with their dietitians. This way triggering parts can be discussed with the dietitian immediately.

The next step is creating an introduction video and manual, limiting the number of mini-games, creating a growing phone background, improving the low fi-prototype into a 'real' prototype, and doing a user test after this.

However, Dietitian and nutritionist Marijke Kneepkens and psychiatrist and teacher of eating disorders Annemarie van Elburg expressed their preference for mini-game four, which focused on the plate concept. This idea would be suitable to showcase at the Nederlandse Academie Eetstoornissen (Dutch Academy for Eating Disorders) day. Therefore, the next steps included programming the OLED display with Arduino, prototyping the electronics with the plate, creating an introduction video and manual specifically for the plate concept, and conducting user testing for the complete plate prototype.

RESULTS
USER TEST

During the user test, it was determined that having the sentence displayed for 40 seconds with a 30-second blank interval in between was appropriate. However, it was noted that most participants consumed only a single slice of bread or a small portion of food, rather than a full dinner. For a complete dinner, a longer duration may be necessary as it typically takes more time to finish a meal. Perhaps for the clip, there should be an average time, but the user could also get a button to arrange the sentences by themself. The participants were incredibly careful when sticking the display on the screen, when used to the prototype or without the researcher next to them this could be different. Most of the participants automatically read the question aloud and were sharing their thoughts on this question without the research asking for this, but this gave great insights into their minds, and it gave some feedback for improvements. For example, when the question was read multiple times, this could mean it was a difficult question. The piece of food now placed on the plate during the user test was often small but considering a dinner the plate could be bigger or the display should be food proof as the edge is easily touched by the food.

SURVEY 2

After the user test, a brief survey was conducted to gather feedback on the use of the prototype. The participants were asked various questions, and their responses were rated on a scale from 1 to 5. Here are the findings:

- Understanding of Questions: The participants gave an average score of 4.4, indicating that they found the questions on the display relatively easy to understand. This suggests that there is no need for significant adjustments to the wording of the questions.
- Duration of Sentences and Blank Display: The participants felt that the duration of the sentences on the display and the blank display interval in between were appropriate. However, some participants mentioned that for larger meals, longer durations may be needed.
- Use in Daily Life: The participants rated their likelihood of using the prototype in their daily lives with an average score of 4.0. This indicates a positive response, suggesting that if the product were to be available on the market, they would be inclined to incorporate it into their daily routine.

4.0

- Awareness of Intuitive Eating Principle: When asked if the participants were familiar with the principle of intuitive eating, they gave a rating of 4.2. This implies that they believed using the prototype would improve their understanding of intuitive eating and enhance their ability to eat intuitively.

4.2

- Likelihood of Recommending the Product: The participants expressed a high likelihood of recommending the product to others, giving it an average rating of 4.4. This suggests that they not only found it beneficial for themselves but also believed it could be helpful for their family and friends.

4.4

Overall, the survey results indicate a positive reception of the prototype, with participants finding it understandable, suitable for daily use, and potentially effective in improving intuitive eating knowledge. Additionally, they expressed a willingness to recommend the product to others.

Question nine focused on the product's appearance, specifically whether the text on the display should be enlarged. Four participants responded that it did not matter, and one participant even mentioned that the font size was good as it is. As already discovered with the first survey, the display should get an edge that lights up, when the question arises. Four out of the five answered this.

The remaining questions were more general and aimed at gathering tips and suggestions. Starting with the question if they had some tips to improve the concept in a way that owners of the prototype would not forget to stick the display on the screen when going for a meal.

<div style="background-color:pink; padding:1em;">

Suggestions where:

'Add a logo or text'

'Make sure they stick the display to their next meal already'

'Suggest people to store the display with the dining plates'

</div>

Other answers showed that they liked the small text on the edge of the plate already as a notification. The second-last question asked for more global tips on the prototype. Suggesting adding a video or instruction manual, to add something to the appearance of the plate to make it more appealing and a suggestion to add questions concerning their emotions. Another tip proposed is to add more questions when the meal is bigger, to get more insights for the person. And adding more questions to the possibilities to not get bored or familiar with the question too much. Creating the opportunity for people to keep thinking about every question instead of answering it manually. The last question asked what their thoughts were about the prototype as it was shown now.

<div style="background-color:pink; padding:1em;">

Answers where:

'Easy to use'

'It makes you more conscious during your meal'

'The sentences where clear and the plate is good'

It looked like the prototype demonstrated the use and the looks well.

</div>

POSITION IN CONTEXT
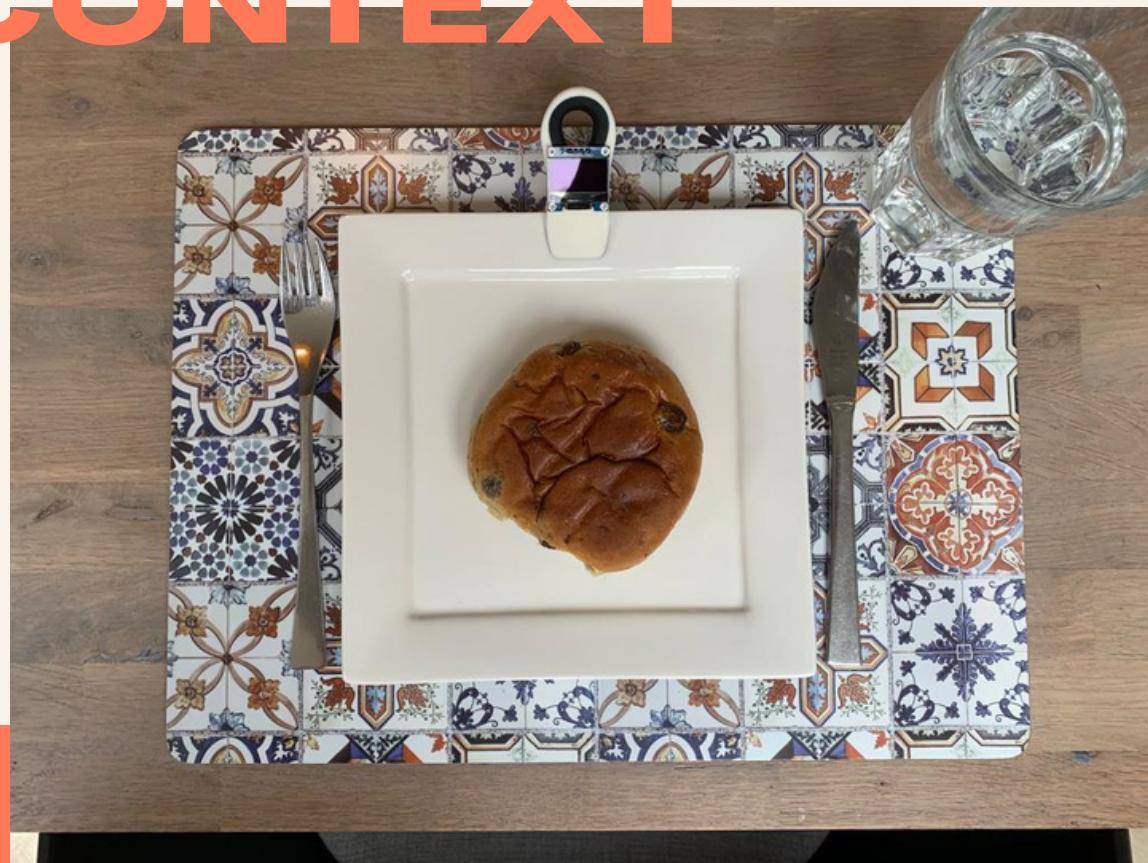
This research has demonstrated the potential for an alternative lifestyle that shifts focus away from weight, diets, and exercise. The prototype developed in this study can be effectively integrated into daily life, either as a supplement to existing resources on intuitive eating or as a standalone tool. Participants found the prototype understandable and believed it could help them connect with their internal body cues while eating. However, there are areas for improvement, such as a further investigation into the optimal duration of the sentence and blank intervals on the display. The sentences given could be personalized in the future to help people more in the area, they find difficult.

There should be more research on a weight sensor or button that starts the sentences when beginning the meal.
More research into an average eating time and more research into programming a button for use. More research into a food-repellent display could be done. The edges of the display should get an LED strip to have more attention when the sentence appears. Contrary to initial assumptions, the text on the display does not need to be enlarged, and neither does the display itself. However, the inclusion of an introduction video and manual would enhance the clarity and ease of use for the product.

DISCUSSION

This research indicates the need for further survey work and user testing specifically targeting individuals within the target group. The target group consists of individuals aged 18 to 80 living in the Netherlands who do not currently practice intuitive eating. The survey results revealed that none of the participants was familiar with intuitive eating and expressed a lack of interest in using the intuitive eating game. However, the five participants in the user test expressed willingness to use the prototype, which was part of the intuitive eating game. Nevertheless, the user test sample size was small and not statistically significant, making it difficult to generalize the findings. Additionally, the participants in the user test only evaluated the appearance of the prototype and did not undergo testing to measure its actual impact on individuals. Given that the prototype could be beneficial for individuals with eating disorders, it is crucial to conduct user testing in collaboration with a dietitian.

During the user test, each participant ate something different and received a random question. It is important to investigate whether this approach introduces bias and affects the results. Furthermore, the presence of the researcher sitting next to the participant during the user test, although necessary to ensure the functionality of the electronics, may have influenced participant behaviour. By having the researcher next to the participant, the participant often spoke aloud the question and the participant was really showing to look at the question. Perhaps when no researcher is next to the participant, the participant will not notice the question. This should have more research.

For future studies, the use of LED strips surrounding the display could be explored to provide visual cues. These strips could be programmed to light up specifically when the sentence is displayed, rather than being constantly illuminated when the device is powered on.
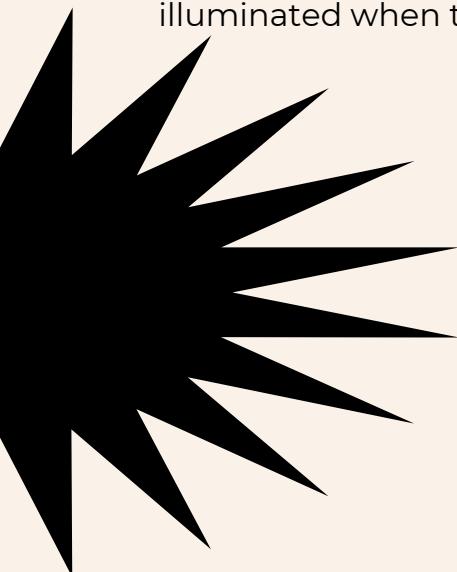
Regarding the timing of the sentence and blank screen intervals, further research can be conducted to determine an optimal duration. One option is to establish an average time based on user preferences, as indicated by the Demoday visitors who favoured this idea. Alternatively, incorporating a button that allows users to control the timing themselves could be explored. Additionally, investigating the use of a weight sensor or load cell underneath the plate could provide precise timing information. However, considerations should be made to ensure the sensor is not too thick and does not interfere with the eating experience, particularly when cutting food or eating with hands. But the code should consider that a person can put force onto the plate when cutting their food and, when eating a slice of bread someone can eat with his hands and take the piece of bread off the plate while eating.

To gain a better understanding of participants' intuitive eating habits, it could be beneficial to administer the questionnaire developed by Tylka (2006; 2013) before conducting the user test. This questionnaire can determine if an individual already practices intuitive eating or not, providing insights into their baseline eating behaviours and attitudes.

By incorporating these elements into future research, a more comprehensive understanding of the relationship between emotions, intuitive eating, and the effectiveness of the prototype can be obtained.
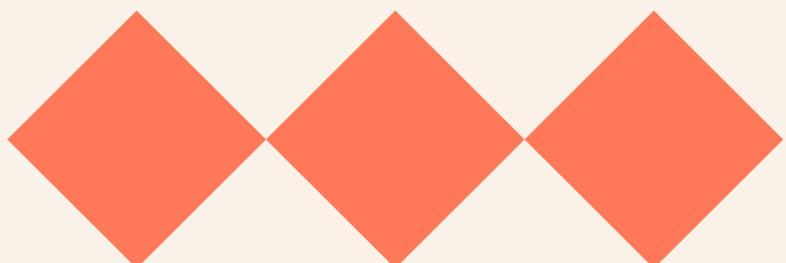
CONCLUSION
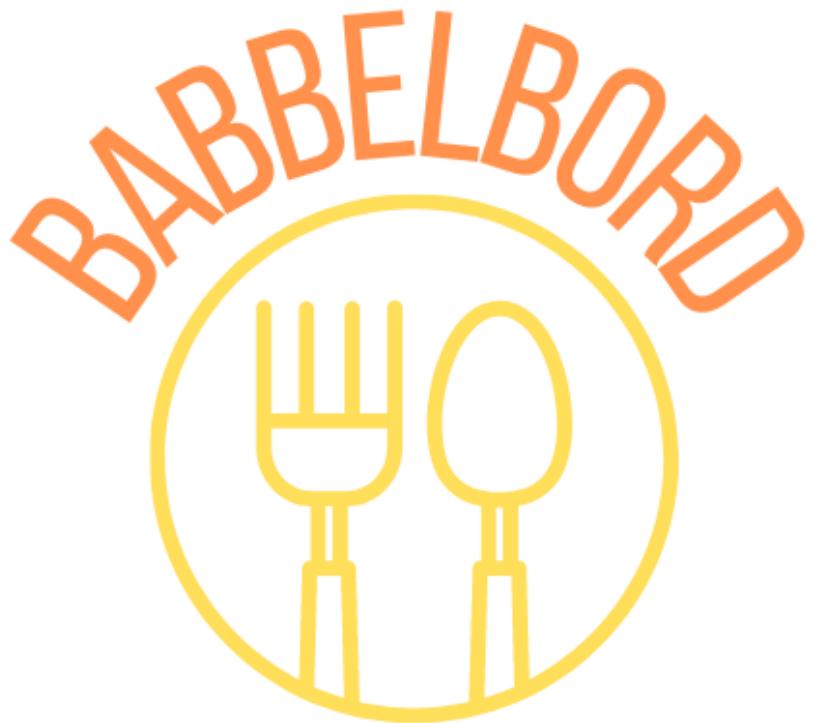
This research demonstrates that the Babbelbord product has the potential to have a positive impact on daily life by helping non-intuitive eaters learn to eat intuitively. It can serve as a valuable complement to the existing Intuitive Eating book and workbook by Tribole & Resch (2020). The interactive learning approach offered by the Babbelbord can effectively facilitate the reconnection with inner body cues for intuitive eating.

The product Babbelbord existed out of a placemat with display and clip with display, but the clip with display would be the preferred product for further research. Ultimately, this project has laid the foundation for introducing and promoting intuitive eating knowledge and its practical application in the Netherlands.

THANK YOU

I am deeply grateful for the support and assistance I received from those around me during this project.

I would like to express my sincere appreciation to Coach Daniel Tetteroo for his guidance and enthusiasm in helping me navigate through a topic that was relatively new in the health field.

A big thank you to the people who took the time to fill in the survey and participate in the user tests, including the additional survey. Your input and contribution have been instrumental in shaping this research.

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A big thanks to Daisy O'Neill for her efforts in raising awareness about intuitive eating at Tu/e for the subject intuitive eating and for assisting me in getting started with my FBP.

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APPENDIX

APPENDIX A

Op weg naar intuïtief eten

54	10:25	Active
Responses	Average time to complete	Status

1.*!Let op! In dit formulier word gesproken over diëten, heb jij dit liever niet, sla dan de survey over*

Het doel van dit stukje tekst is om jou te informeren over de aard van het onderzoek van Lisanne de Jonge bij de afdeling Industrial Design en om toestemming voor deelname te vragen.

Deelname aan dit experiment is strikt vrijwillig. Jij kunt op elk moment stoppen. Twijfel jij over deelname of heb je vragen over het onderzoek, stel ze gerust aan Lisanne de Jonge (e-mail; l.j.j.d.jonge@student.tue.nl).

De enquête vragen gaan over intuïtief eten en een methode om tot deze levensstijl te komen. De antwoorden op de enquête worden beoordeeld door Lisanne de Jonge. Alle gegevens die in dit experiment worden verkregen, worden anoniem verwerkt.

Ik heb dit toestemmingsformulier gelezen en begrepen. Ik ga akkoord met deelname aan het onderzoek van Lisanne de Jonge, afdeling Industrial Design van de Technische Universiteit Eindhoven.

● Ik geef toestemming	54
● Ik geef geen toestemming	0
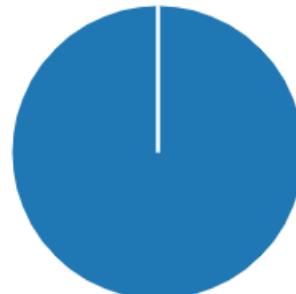
2.Kom jij uit Nederland?

🔵 Ja   52

🟠 Nee   2
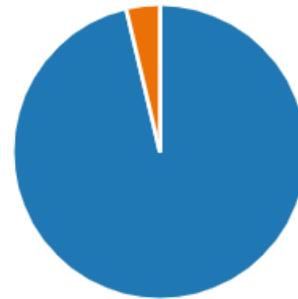
3.Welk geslacht heb jij?

🔵 Vrouw   34

🟠 Man   18

🟢 Non-binair   0

🔴 Wil ik liever niet zeggen   0

4.Hoe oud ben jij?

🔵 18-24   jaar   1

🟠 25-29   jaar   4

🟢 30-34   jaar   5

🔴 35-39   jaar   3

🟣 40-44   jaar   1

🟤 45-49   jaar   0

🩷 50-54   jaar   6

⚫ 55-59   jaar   8

🟡 60-64   jaar   8

🔵 65+ jaar   6

     1
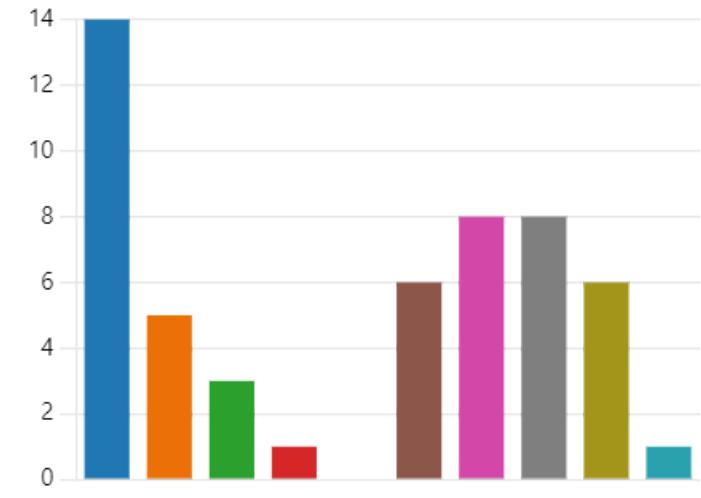
5.Heb jij wel eens een dieet gevolgd? Paleo, Weight Watchers, keto, detox, etc.

🔵 Ja, meerdere	17
🟠 Ja, één keer	7
🟢 Nee, nog nooit gedaan	28

6.Ken jij het concept Intuitive eating?

🔵 Nee, nooit van gehoord	29
🟠 Nee, maar ik heb er wel eens va...	11
🟢 Ja, ik ken het	6
🔴 Ja, ik gebruik het	6

7.Zou jij dit gebruiken?

🔵 Ja	12
🟠 Nee	15
🟢 Misschien	25

8.Zou jij dit aan iemand aanbevelen?

🔵 Ja	32
🟠 Nee	20

9.Vind jij dat er een beloning in het spel moet zitten?

🔵 Ja	19
🟠 Nee	33
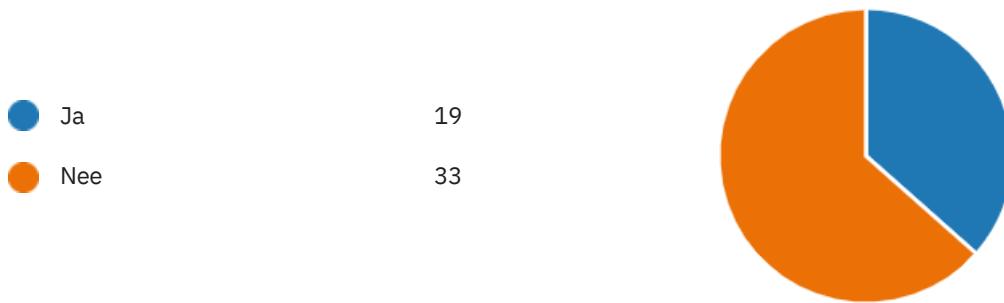
10.Wat voor beloning?

34
Responses

Latest Responses
"Ik heb bij vraag 8 nee aangeduid omdat ik dit enkel zou aan…

11.Wat vind jij goed aan het product? Noem hier de eventuele tops

52
Responses

Latest Responses
"Het is goed dat het rustig begint en opbouwt in levels."
"Het maakt je bewust van je eet patronen en zorgt voor een …
"Speels, leuk"

12.Wat zou jij verbeteren aan het product? Zodat je het wellicht wel zou gebruiken

52
Responses

Latest Responses
"Het zijn wel veel mini games, het kan daardoor wat overwel…
"Wellicht iets om samen te doen zodat je elkaar motiveert o…
"Het is voor mij te straight forward, ik geloof dat je meer dan…

13.Welk cijfer zou jij het product geven?

3.56
Average Rating
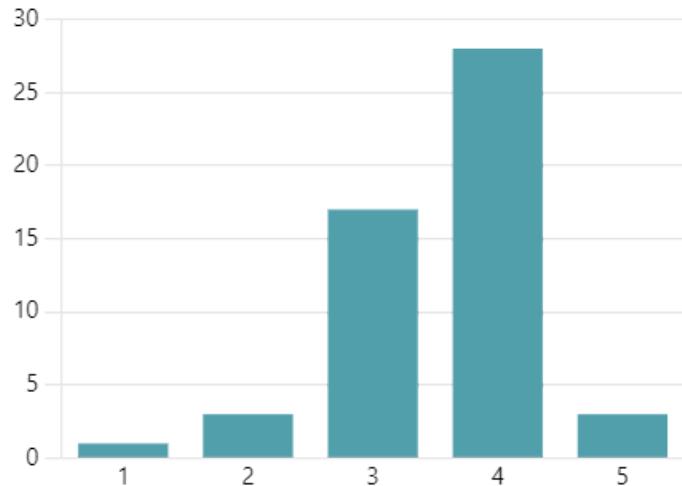
14.Zou er iets naast het spel moeten zijn om je te helpen herinneren het spel te gaan spelen?

🔵 Nee9

🟠 Ja, zoals een schilderij met een r...5

🟢 Ja, zoals een sieraden doosje wa...0

🔴 Ja, zoals een achtergrond op je t...32

🟣 Ja, zoals.... (eigen idee)6
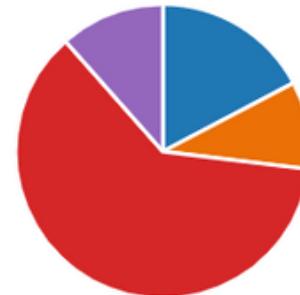
15.Zoals een .... (schrijf hier je eigen idee)

5
Responses

Latest Responses
"Berichtjes of mailtjes met een reminder. "

16.Zou de zin in het bord (bij mini game 4) moeten oplichten wanneer het verschijnt?

● ja   4
● nee   2

17.Zou ik het hele spel concept moeten schrappen en alleen het bord (van mini game 4) verder uitwerken? Het bord gaf je tijdens het eten een zin om jou te laten stil staan over je eten.

● Nee   4
● Ja   2

18.Zou jij willen mee doen aan een user test over dit product (duur; maximaal 30min)? Zo ja, vul hier dan alstublieft jouw emailadres in zodat ik je kan bereiken. Alvast bedankt.

29
Responses

Latest Responses
"tinasomers@lievereten.be"

Appendix B

https://youtu.be/Fk2n7CqyT2k

Appendix C

```cpp
//including all the needed programms from Arduino, like Adafruit
#include <Wire.h>
#include <Adafruit_GFX.h>
#include <Adafruit_SSD1306.h>
#include <Fonts/FreeSans9pt7b.h> //this is the font I use

#define SCREEN_WIDTH 128 // OLED display width, in pixels
#define SCREEN_HEIGHT 64 // OLED display height, in pixels

// Declaration for an SSD1306 display connected to I2C (SDA, SCL pins)
Adafruit_SSD1306 display(SCREEN_WIDTH, SCREEN_HEIGHT, &Wire, -1);
```

```cpp
//The image information
static const unsigned char PROGMEM image_data_bestekenbord20[] = {
 0xff, 0xff, 0xff, 0xff, 0xff, 0xff, 0xe0,
   //0xff, 0xff, 0xff, 0xff, 0xff, 0xff, 0xe0,
   0xff, 0xff, 0xff, 0xff, 0xff, 0xff, 0xe0,
   0xff, 0xff, 0xff, 0xff, 0xff, 0xff, 0xe0,
   0xff, 0xff, 0xff, 0xff, 0xff, 0xff, 0x80,
   0xff, 0xff, 0xff, 0xff, 0xff, 0xff, 0x00,
   0xff, 0xff, 0xff, 0xff, 0xff, 0xff, 0x00,
   0xdb, 0xff, 0xf0, 0x00, 0xff, 0xff, 0x00,
   0xdb, 0xff, 0x80, 0x00, 0x1f, 0xff, 0x00,
   0x53, 0xfe, 0x00, 0x00, 0x07, 0xfe, 0x00,
   0x51, 0xf8, 0x01, 0xf8, 0x03, 0xfe, 0x00,
   0x51, 0xf0, 0x18, 0x00, 0x00, 0xfe, 0x00,
   0x51, 0xe0, 0x20, 0x00, 0x00, 0x7e, 0x00,
   0x01, 0xc0, 0x80, 0x00, 0x00, 0x3e, 0x00,
   0x03, 0xc1, 0x00, 0x00, 0x00, 0x3c, 0x00,
   0x83, 0x82, 0x00, 0x00, 0x00, 0x1c, 0x00,
   0x83, 0x86, 0x00, 0x00, 0x00, 0x1c, 0x00,
   0xc7, 0x04, 0x00, 0x00, 0x00, 0x0c, 0x00,
   0xcf, 0x08, 0x00, 0x00, 0x00, 0x0c, 0x20,
   0xef, 0x08, 0x00, 0x00, 0x00, 0x0c, 0x20,
   0xee, 0x08, 0x00, 0x00, 0x00, 0x0e, 0x20,
   0xee, 0x08, 0x00, 0x00, 0x00, 0x07, 0x20,
   0xee, 0x08, 0x00, 0x00, 0x00, 0x07, 0x20,
   0xee, 0x08, 0x00, 0x00, 0x00, 0x0f, 0xa0,
   0xef, 0x08, 0x00, 0x00, 0x00, 0x0f, 0xa0,
   0xef, 0x08, 0x00, 0x00, 0x00, 0x0f, 0x20,
   0xcf, 0x04, 0x00, 0x00, 0x00, 0x0f, 0x20,
   0xcf, 0x84, 0x00, 0x00, 0x00, 0x1f, 0x20,
   0xc7, 0x82, 0x00, 0x00, 0x00, 0x1f, 0x00,
   0xc7, 0xc1, 0x00, 0x00, 0x00, 0x3f, 0x00,
   0xc7, 0xe0, 0x80, 0x00, 0x00, 0x7f, 0x00,
   0xc7, 0xe0, 0x00, 0x00, 0x00, 0xff, 0x00,
   0xc7, 0xf8, 0x00, 0x00, 0x00, 0xff, 0x00,
   0xc7, 0xfc, 0x00, 0x00, 0x03, 0xff, 0x00,
   0xc7, 0xfe, 0x00, 0x00, 0x0f, 0xff, 0x00,
   0xc7, 0xff, 0x80, 0x00, 0x1f, 0xff, 0x00,
   0xc7, 0xff, 0xf0, 0x00, 0xff, 0xff, 0x00,
   0xc7, 0xff, 0xff, 0xff, 0xff, 0xff, 0x20,
   0xff, 0xff, 0xff, 0xff, 0xff, 0xff, 0xe0,
   0xff, 0xff, 0xff, 0xff, 0xff, 0xff, 0xe0,
   0xff, 0xff, 0xff, 0xff, 0xff, 0xff, 0xe0,
   0xff, 0xff, 0xff, 0xff, 0xff, 0xff, 0xe0
};

//Thess are the sentences for at the start, in the middle and after the meal
//Storing the sentences in PROGMEM to avoid memory issues (see
https://www.arduino.cc/reference/en/language/variables/utilities/progmem/)
const char b1[] PROGMEM = "Hoe ruikt het  eten?";
const char b2[] PROGMEM = "Hoe ziet het  eten er uit?";
const char b3[] PROGMEM = "Ziet het eten er lekker uit?";
const char b4[] PROGMEM = "Welke kleuren heeft het eten?";
```

```arduino
static const char* const phrasesbefore[] PROGMEM = {b1,b2,b3,b4};
short before1;

const char m1[] PROGMEM = "Neem een        slokje drinken";
const char m2[] PROGMEM = "Proeft het eten  lekker?";
const char m3[] PROGMEM = "Ziet het er uit    zoals het proeft?";
const char m4[] PROGMEM = "Heb je honger  of zit je vol?";

static const char* const phrasesmiddle[] PROGMEM = {m1,m2,m3,m4};
short middle1;

const char a1[] PROGMEM = "Proefte het eten zoals het er uit  zag?";
const char a2[] PROGMEM = "Zou je het nog een keer eten?";
const char a3[] PROGMEM = "Ben je              verzadigd?";
const char a4[] PROGMEM = "Was de 1e hap zoals de laatste?";

static const char* const phrasesafter[] PROGMEM = {a1,a2,a3,a4};
short after1;

char buffer[39]; // so the memory from the PROGMEM can be read, 39 because the longest
sentence has 39 characters otherwise with 38 for example this sentence couldn't be read

void setup() {
 Serial.begin(115200);
 randomSeed(analogRead(0)); //to create the random sentence
 Serial.println(F("a"));
 // SSD1306_SWITCHCAPVCC = generate display voltage from 3.3V internally
 if(!display.begin(SSD1306_SWITCHCAPVCC, 0x3C)) { // Address 0x3D for 128x64
  Serial.println(F("SSD1306 allocation failed"));
  for(;;); // Don't proceed, loop forever
 }
 delay(2000); // Pause for 2 seconds
 Serial.println(F("b"));
 // Clear the buffer.
 display.clearDisplay();

 //Draw bitmap on the screen
 display.drawBitmap(40, 10, image_data_bestekenbord20, 51, 42, 1);
 display.display();
 delay(3000); //2 seconds
 display.clearDisplay();
 display.setFont(&FreeSans9pt7b); //the font
 display.setTextSize(1);
 display.setTextColor(WHITE);
 display.setCursor(0, 15);
 // Display static text
 display.println("Eet smakkelijk!");
 display.display();
 delay(1500); // 1 second
 display.clearDisplay();
```

```
  display.setTextSize(1);
  display.setTextColor(WHITE);
  display.setCursor(0,15);
  before1 = random(4);   //get random sentence from list
  strcpy_P(buffer, (char *)pgm_read_word(&(phrasesbefore[before1])));   // Necessary
casts and dereferencing, just copy.
  display.println(buffer); //use it as the index to the array of phrases
  display.display();
  delay(40625); //41 seconds is the sentence on the display
  display.clearDisplay();

// //to get a blank screen inbetween
  display.display();
  delay(31250); //the display is 31 seconds blank
  display.clearDisplay();

  display.setCursor(0,15);
  middle1 = random(4);   //get random sentence from list middle
  strcpy_P(buffer, (char *)pgm_read_word(&(phrasesmiddle[middle1])));   // Necessary
casts and dereferencing, just copy.
  display.println(buffer); //use it as the index to the array of phrases
  display.display();
  delay(40625); //41 seconds is the sentence on the display
  display.clearDisplay();

// //to get a blank screen inbetween
  display.display();
  delay(31250); //the display is 31 seconds blank
  display.clearDisplay();

  display.setCursor(0,15);
  after1 = random(4);   //get random sentence from list after
  strcpy_P(buffer, (char *)pgm_read_word(&(phrasesafter[after1])));   // Necessary
casts and dereferencing, just copy.
  display.println(buffer); //use it as the index to the array of phrases
  display.display();
  delay(40625); //41 seconds is the sentence on the display
  display.clearDisplay();

  display.setCursor(0, 15);
 // Display static text
  display.println("Fijne dag!");
  display.display();
  delay(1500); // 1 second
  display.clearDisplay();

}

void loop() {

}
```
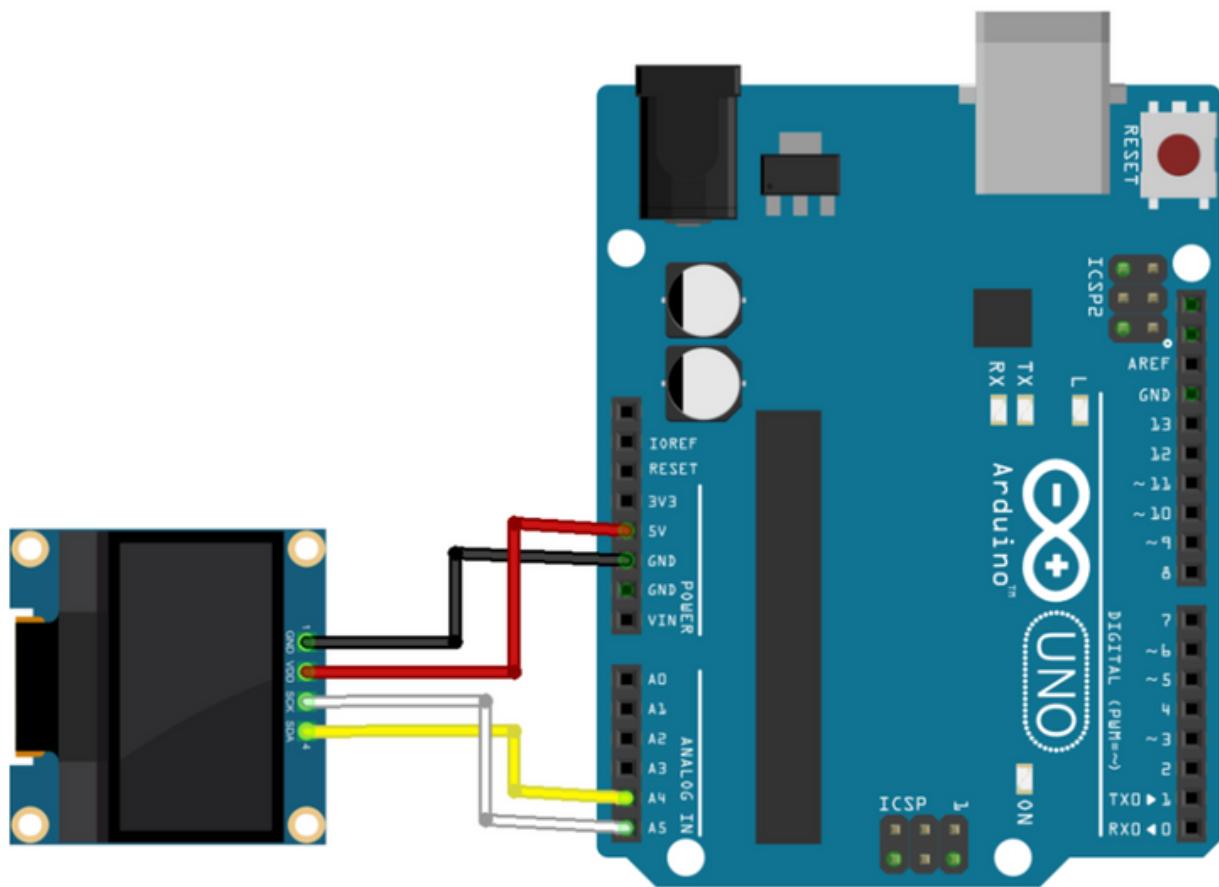
schematic (Santos & Santos, 2023)

APPENDIX D

Voor na de user test, survey

5	32:15	Active
Responses	Average time to complete	Status

1.Het doel van dit stukje tekst is om jou te informeren over de aard van het onderzoek van Lisanne de Jonge bij de afdeling Industrial Design en om toestemming voor deelname te vragen.

Deelname aan dit experiment is strikt vrijwillig. Jij kunt op elk moment stoppen. Twijfel jij over deelname of heb je vragen over het onderzoek, stel ze gerust aan Lisanne de Jonge (e-mail; l.j.j.d.jonge@student.tue.nl).

De enquête vragen gaan de user test die jij hebt afegelgd. De antwoorden op de enquête worden beoordeeld door Lisanne de Jonge. Alle gegevens die in dit experiment worden verkregen, worden anoniem verwerkt.

Ik heb dit toestemmingsformulier gelezen en begrepen. Ik ga akkoord met deelname aan het onderzoek van Lisanne de Jonge, afdeling Industrial Design van de Technische Universiteit Eindhoven.

Ik ga akkoord	5
Ik ga niet akkoord	0
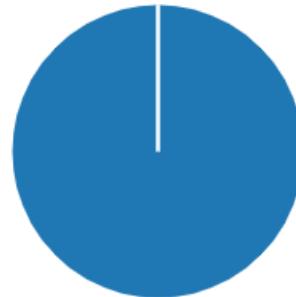
2.Waren de zinnen makkelijk te begrijpen?

4.40
Average Rating
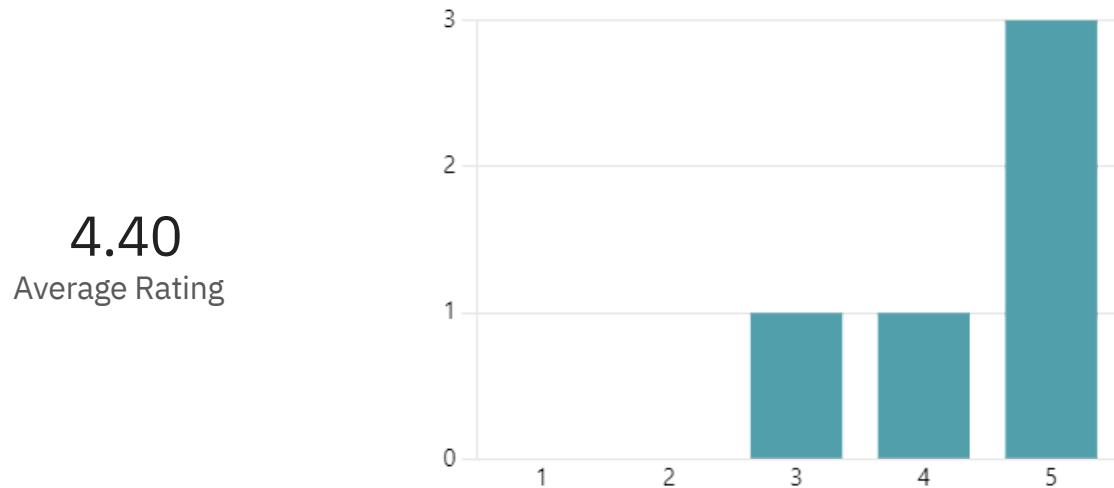
3.Was de tijd tussen de zinnen passend? Ja, nee, mag 1 min langer, mag 2 min korter, etc.

5
Responses

Latest Responses
"Dat ligt aan het type maaltijd."

"Ja! Bij een grote maaltijd wellicht langer de tijd nodig tussen..." "Normaal gesproken wel, maar omdat ik nu een klein bakje y..."
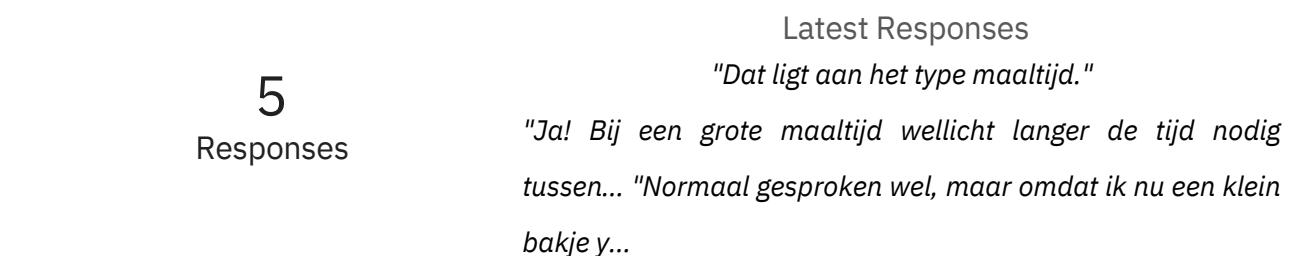
4.Zou je dit product in je dagelijks leven gaan gebruiken?

4.00
Average Rating
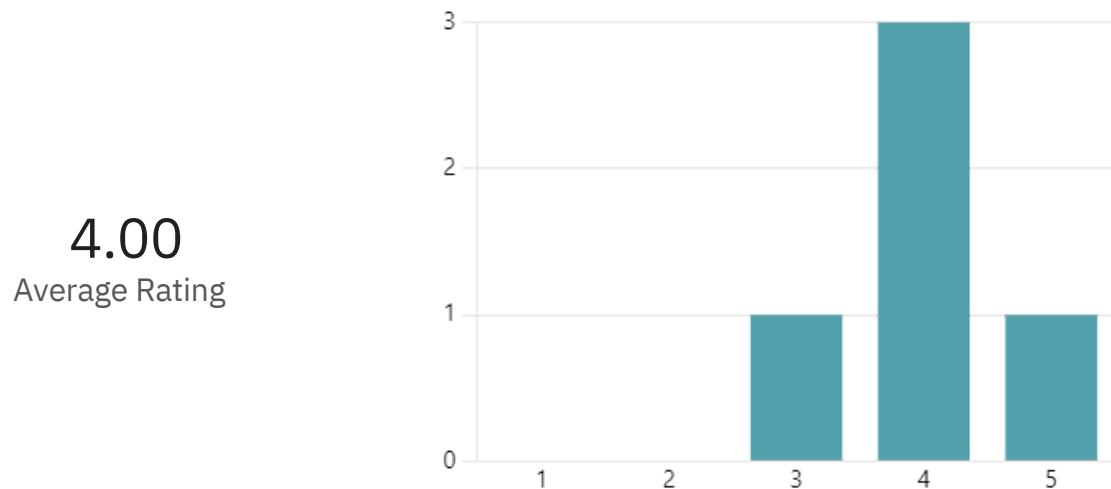
5.Ken je het principe intuïtief eten?

🔵 Ja	2
🟠 Heb er wel eens van gehoord	3
🟢 Nee	0

6. Intuïtief eten gaat er om dat je beter luistert naar je honger en vol gevoelens, beter luistert naar je emoties, beter luistert naar je lichaam tijdens het bewegen en dat je je lichaam respecteert zoals het is.

3
Responses

Latest Responses
"Ja! "

7.Snap je door het product beter hoe je intuïtief kan eten?

4.20
Average Rating
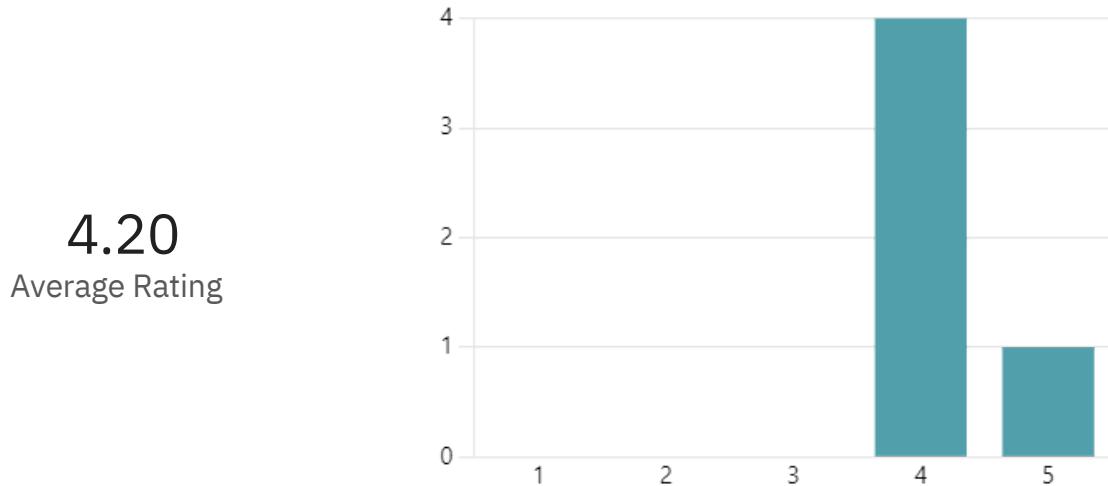
8.Zou je dit product aanraden aan andere mensen?

4.40
Average Rating
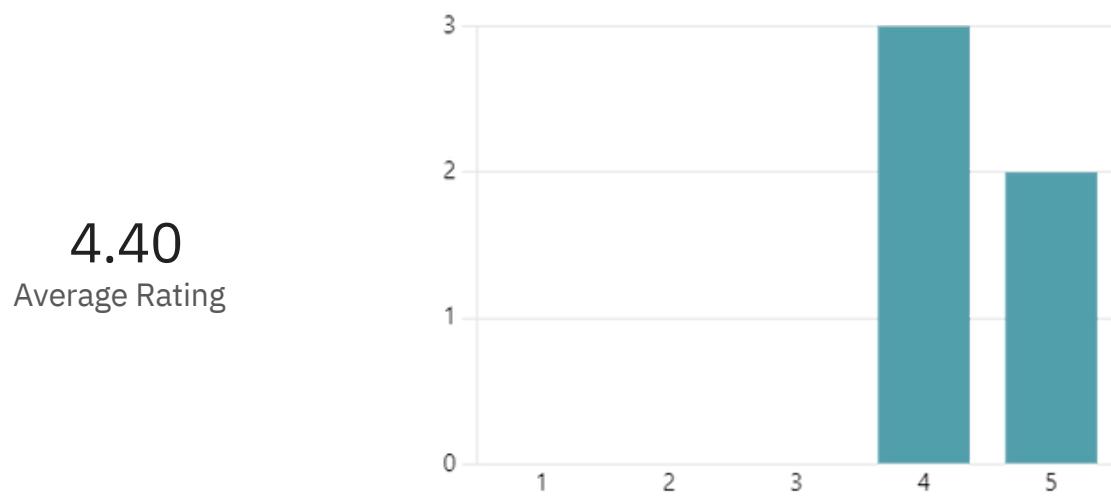
9.Zou de tekst groter moeten en dus ook het schermpje?

🔵 Ja	0
🟠 Maakt mij niet zoveel uit	4
🟢 Nee, dit is goed	1

10.Zou er een rand moeten oplichtten wanneer de zin verschijnt?

🔵 Ja	4
🟠 Nee	1

11.Heb je nog tips hoe we zouden kunnen zorgen dat je niet vergeet het schermpje op het bord te klikken?

5
Responses

Latest Responses
"Bord met logo of tekst "

"Geef mensen als tip mee het schermpje te bewaren bij de bo... "Misschien dat het mogelijk is om het schermpje op je eerstvo...

12.Heb je verder nog tips?

5
Responses

Latest Responses
"Nee"

"Nee! Enorm goed bedacht, leuk concept"

"Doe er een fototje bij☺ Misschien is het handig om een "ho...

13.Wat vond je goed aan het product?

<div align="center">

Latest Responses

"Het maakt je bewust van wat je eet. "

5

Responses

"Het laat je heel erg bewust zijn van het eten"

"Duidelijke zinnen, het bord is leuk. Het werkt! Je gaat echt b…

</div>

14.Bedankt voor het invullen!

<div align="center">

Latest Responses

"Graag gedaan "

2

Responses

"Slim idee!"

"😟"

</div>

APPENDIX E

BABBELBORD

BABBELBORD
HANDLEIDING
HANDLEIDING
HANDLEIDING
HANDLEIDING

TIME TO START!
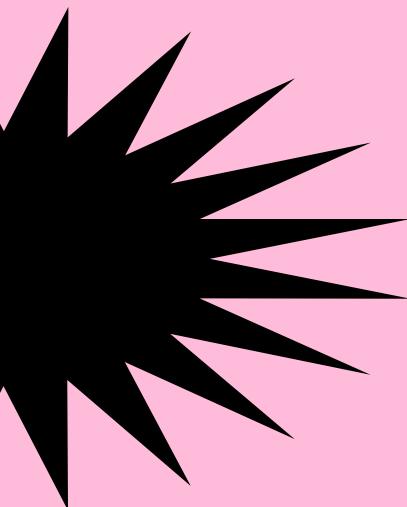
Bedankt voor het kiezen voor Babbelbord!

Het klinkt misschien een beetje bevooroordeeld, maar ik ben heel blij dat je deze goede keuze hebt gemaakt en ik ben heel blij nu uit te maken van je dagelijkse maaltijden.

Samen kunnen wij zorgen dat je een intuïtieve levensstijl krijgt die je voor altijd kan vasthouden en alleen maar meer zal verbeteren.

Het idee dat je hiermee van het eindeloos vermoeiende, geld verspillende en tijd rovende diëten kan afkomen maakt me blij.

Veel plezier met eten! Hopelijk brengt het je naar je doel en vrijheid in het eten. Veel plezier met het proces! En houd in gedachte een proces is niet in een dag volbracht, geef en gun jezelf de tijd.

Lisanne

JOU INTUÏTIEF LATEN ETEN

Intuïtief eten gaat om het luisteren naar je eigen lichaamssignalen. Het opmerken wanneer je vol zit. Het signaleren wanneer je honger hebt. Het inzien waar je zin in hebt en waar jij je verzadigd door voelt.

We willen je die gevoelens in je lichaam laten ervaren. Dit proberen we te doen door je aan het begin van je maaltijd, in het midden en aan het einde een vraag te stellen. Door deze vraag even op het scherm te laten staan heb jij de tijd om de vraag te beantwoorden en op deze manier te reflecteren. Hiermee kan je meer gaan nadenken over wat je eet en wat je voelt tijdens en na het eten.

De vragen zullen je helpen stil te staan. Hierdoor zal je meer mindfull eten en misschien ook wel aan het begin wat minder snel eten dan dat je gewend was. Je mag zelf weten of je het Babbelbord voor elke maaltijd gebruikt óf dat je het Babbelbord alleen voor een snack gebruikt óf voor maar één maaltijd.

WAAR BESTAAT BABBELBORD UIT?

Het placemat met display

HET PLACEMAT MET DISPLAY

Het placemat bevat de display waarop de zinnen te zien zijn. Deze worden zichtbaar wanneer jij gaat eten.
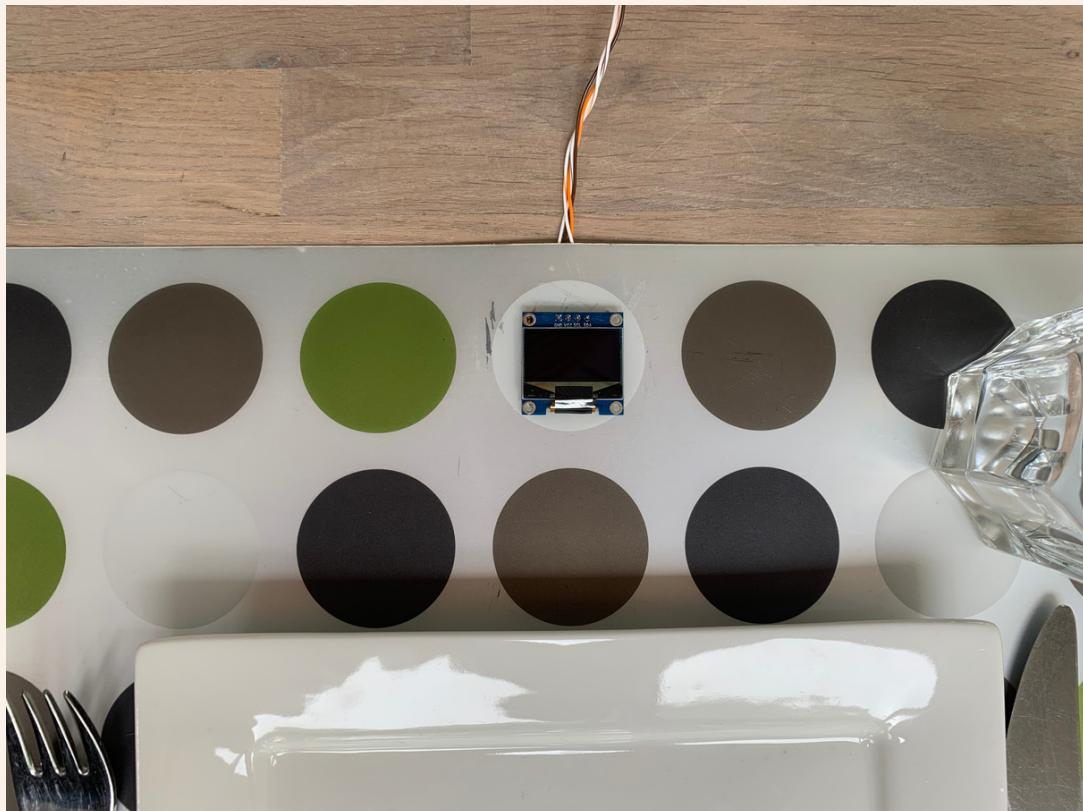
Het display met clip

DE CLIP

De clip bevat een display waarop de zinnen te zien zijn. Deze klik je vast op het bord wanneer je gaat eten.

HET BORD

Hieraan bevestig je de clip en hierop kan jij je maaltijd eten.

Babbelbord

OM VOOR ALTIJD MEE TE GAAN

Zorg dat er geen eten in de clip komt. Gebeurt dit wel, kan gebeuren! Haal dan een vochtig doekje over de clip heen en het display om zo te kunnen zorgen dat je Babbelbord altijd kan blijven gebruiken. Door de clip van het bord te halen kan je het bord gewoon in de afwasmachine stoppen of natuurlijk zelf met de hand afwassen.
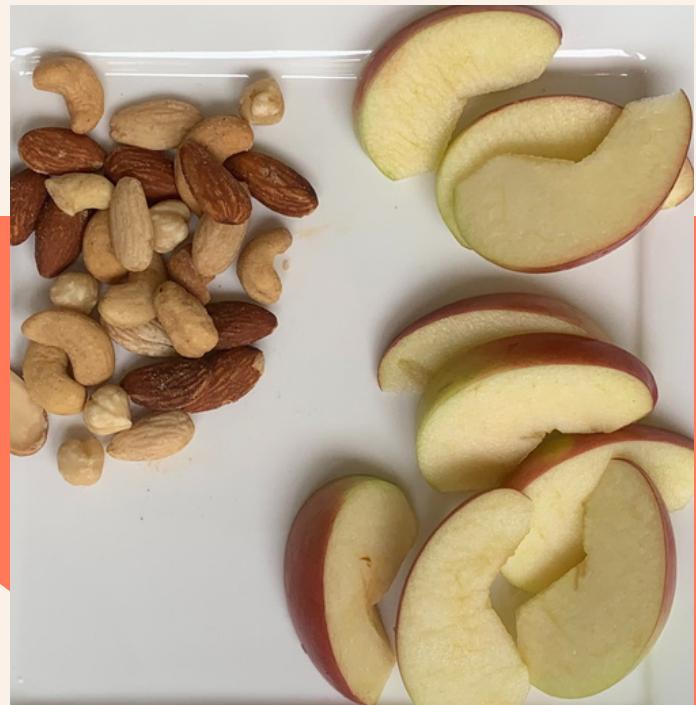
BABBELBORD

Wil je meer weten over Babbelbord of heb je handige tips? Of heeft jouw Babbelbord een reparatie nodig? Laat het me weten via:

www.lisannedejonge.nl
lisannedejonge@live.nl

instructievideo
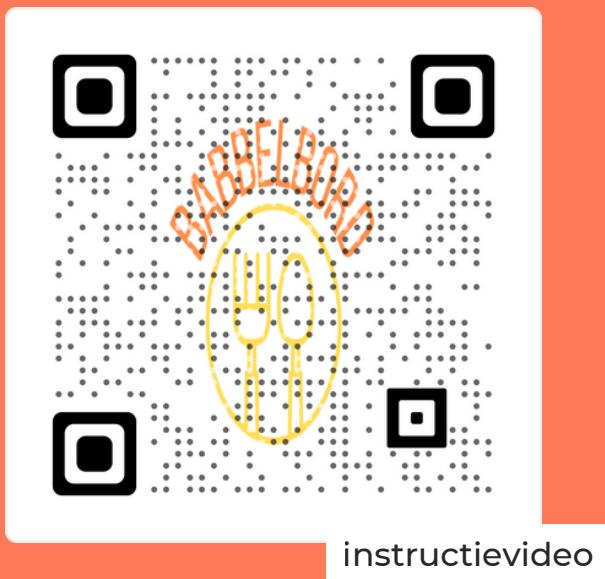
Volg Babbelbord via:

APPENDIX F

https://www.canva.com/design/DAFkxWSq2vw/cL7Tr4vUGNlLALGNBwJQ_A/watch?
utm_content=DAFkxWSq2vw&utm_campaign=designshare&utm_medium=link&utm_source=publishsharelink

APPENDIX G

Informed consent form for participation in Research
Final Bachelor Project, Subject Intuitive Eating, Department of Industrial Industrial Design,
Eindhoven University of Technology

!Caution! In this research will be talked about dieting, when you don't want to think/talk about dieting, do not participate in this research.

The purpose of this form is to inform you of the nature of the research conducted by Lisanne de Jonge at the Industrial Design department and to ask for your informed consent to participate. Your participation in this experiment is strictly voluntary. You may choose not to participate, and you may withdraw at any time during the user test/survey. If there are any hesitations about participating or you have any questions about the research, please feel free to ask Lisanne de Jonge (e-mail; l.j.j.d.jonge@student.tue.nl).

You will be asked to participate in a survey and a follow up user test about the topic intuitive eating. The survey questions will be about intuitive eating and a solution to come to this mind-body health approach. The user test will be about the intuitive eating prototype by asking questions and by use. The survey will not take longer than 5 minutes and the user test no longer than 30 minutes.

The answers on the survey will be evaluated by Lisanne de Jonge. During the user test notes will be taken. All data obtained in this experiment will be processed and reported anonymously.

I, (NAME)... have read and understood this consent form and have been given the opportunity to ask questions. I agree with participating in the research conducted by Lisanne de Jonge, Department of Industrial Design of the Eindhoven University of Technology.

------------------------------------ -------------------------
Signature ParticipantDate

APPENDIX H

Ms. L. de Jonge
l.j.j.d.jonge@student.tue.nl

TU/e

**EINDHOVEN
UNIVERSITY OF
TECHNOLOGY**

Ethical review research proposal

Dear Ms. de Jonge,

It is a pleasure to inform you that the Ethical Review Board (ERB) has discussed and approved your application "FBP Lisanne de Jonge".
The Board wants to draw your attention to the terms and conditions in the appendix.

Success with your research!

Sincerely,

Dr. D. Lakens
Chair Ethical Review Board TU/e

Enclosures
1

The ERB retains the right to revise its decision regarding the implementation and the WMO1/WMH2 status of any research study in response to changing regulations, research activities, or other unforeseen circumstances that are relevant to reviewing any such study. The ERB shall notify the principal researcher of its revised decision and of the reasons for having revised its decision.

1
WMO: Law on Medical Scientific Research involving Human Beings (in Dutch: Wet medisch-wetenschappelijk onderzoek met mensen)
2
WMH: Medical Device Directive (in Dutch: Wet op de medische hulpmiddelen)

TU/e

APPENDIX 1

Terms and conditions

Amendments

When considerable amendments are made to the design of the study or educational activity, or when the time period between ERB approval and start of the study is longer than one year, please consult the ERB.

Privacy and research data management

The ERB would like to point out that collecting, handling and storing personal information is subject to the General Data Protection Regulation. Please visit TU/e intranet for the latest information and regulations on www.tue.nl/rdm