somnia

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Topic: Sleep

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Introduction

Imagine you could do anything you wanted, without limitations. What would you do? Travel around the globe? Learn how to fly? Or perhaps talk to a lost one?

These are experiences you could have in a lucid dream.

We, Josefine Funnekotter, Jesse Janssen and Emma van Dormalen, are Industrial Design students from Eindhoven University of Technology. In our B1 project, we dove into the topic of Sleep and more specifically, lucid dreaming.
Lucid dreams are dreams in which you are aware of the fact that you are dreaming. In this state, you are able to control your dreams. Lucid dreaming is a skill anyone can train.

In this report, we have documented our progress in designing a training device for these lucid dreams: Somnia. In the following pages you can read about the steps we took and their outcomes.

Project goal

The goal of our project was to create a device and/or platform, that guides people through the process of becoming a lucid dreamer, and keep them motivated during this time.

Besides the goal for our product, we wrote down our learning goals at the start of the semester. Some personal learning goals were becoming better at prototyping, learning more about programming and using computer programs like Adobe Photoshop, Illustrator and InDesign. Some of us also wanted to improve their presentation and organizing skills.

Process

The process of this design project started with a pressure cooker, where we went through the whole design process, in one week. We did some ideation, sketched, made a low-fi prototype and presented our idea to our tutor group.
After the pressure cooker, it was more about collaboration and meeting skills, in our group. We needed a couple of meetings, in order to work together smoothly.

The next step was ideation. To stimulate our creativity, we used time boxing. The main ideas were a massaging sleeping mask, a bed that would make you feel like you sleep in an environment close to nature and a device for lucid dreaming.
We presented our ideas to others, and used their feedback. After discussing together and making drawings of our concepts, we decided to develop something for lucid dreaming.

In order to create a concept, we needed more information about lucid dreaming. We read books and found experiences from lucid dreamers. There are several techniques that could help you get lucid dreams. We came up with different concepts that would help with the process of becoming a lucid dreamer.

We got the feedback that we could perhaps make something, that would guide you through the process, step by step. The target group would be unexperienced, yet interested people. Because of this, we decided to focus on two other techniques: dream recall and reality checks. These mean that you document your dreams and that you check regularly whether you are awake or asleep. Dream recall and reality checks can be considered techniques that are used in the early stages of training lucid dreaming. That matched our target group.

Then, we came up with our first designs: a bracelet that would encourage doing reality checks each hour throughout the day, and an application for your phone, in which you could store your dreams. We started realizing these for the midterm Demo Day.
At the midterm, we got feedback on both the bracelet and the application. For each device, we used this for further steps.

After some discussion and ideation, we did user tests and divided the tasks for realizing both components. The whole process of developing the devices, is described in the iteration part.

At the Final Demo Day, we presented Somnia; our final concept. It consisted of a reality check bracelet and dream recall orbs. Using the devices combined, would facilitate the process of becoming a lucid dreamer, and make it more fun to do.

Lucid dreaming

Reality checks
& Dream recall

Beginners
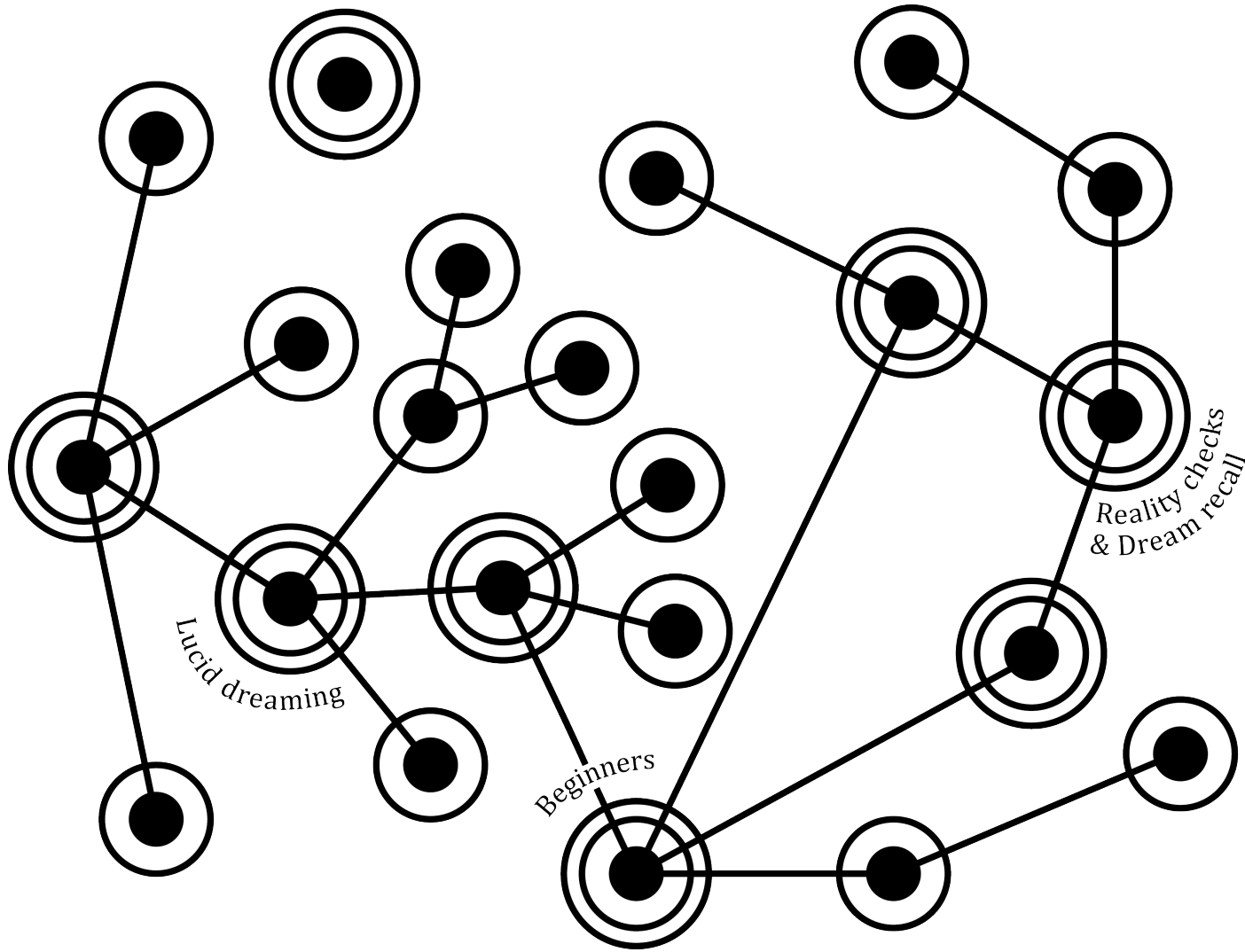
Iterations

Pressure cooker

The project started with a 'pressure cooker', where we went through the full design process in one week. We started off making some mind maps about the topic 'sleep'. We discussed the different stages of sleep, what helped us to get relaxed and what our morning rituals were. The idea of lucid dreaming was already brought up, but not all of us were convinced yet. We saved that idea for a discussion after the pressure cooker. After a short ideation, we agreed on developing a concept that helps people fall asleep more easily. We thought that creating a comfortable environment for a night of sleep was the most interesting to work with.

Too much unnatural (blue) light appears to be one of the main problems for falling asleep in the evening. As nature sounds, the right light and environment can have a calming effect on many people. We wanted to implement these as well. The concept was: projecting an animation on the ceiling in a bedroom. We thought a sky full of stars would be relaxing and close to nature. The light of the stars would have to be the right wavelength, to make you sleepy instead of awake.

To present our idea, we wanted to make a quick and efficient prototype. Our tutor came up with the idea of making our own small projector, with a drawing and the flashlight of a mobile phone. Another possibility was using a shoebox as the bedroom, like a show-box, and then changing the lid (the 'ceiling'). Eventually, the most effective way for us, was to make a drawing. The ceiling is cut out and you can put different pictures behind it as the projected ceiling. We presented this prototype at the end of the pressure cooker week.

Ideation

Having finished the pressure cooker, it was time for us to get started on our real project. In the week of the pressure cooker, we had had a hard time communicating and collaborating. We had a meeting with our project coach to resolve our issues and later spent a meeting discussing what we wanted to get out of this project and how we wanted to work together in the future.

After this, we discussed whether we wanted to continue with our idea for the pressure cooker or not. We decided to have a fresh start and go through the first steps of our pressure cooker again; mind mapping and discussing. During the pressure cooker, mindmapping had not worked for us very well to come up with many ideas. This time, we really wanted to come up with many ideas in a short amount of time, so we used the ideating technique 'time boxing'. There are a few rounds of ideating, where everyone writes down their ideas separately and no one is allowed to say anything. Only after a round of ideating is finished, you discuss.

It made us think out of the box, listen to each other's ideas better and we inspired each other. The ideas were diverse, from temperature-regulating pyjamas to a bed that was built out of Lego. Everyone picked their favorite (combined) ideas and we made a selection which we were continuing with: a bed that would make you feel closer to nature (and help you fall asleep), a 'smart' alarm clock and a device that would help you to become a lucid dreamer. At this point, we had a non-specific concept for all three stages of sleeping.

Because we all wanted to visualise our ideas, we worked them out and made sketches, individually. We showed them to each other and presented them to our tutor group. The feedback they gave us, was to pick one stage of sleeping, instead of keeping it this wide. We all set the goal to do, make and create - being stuck in the ideation stage was not going to help us with that. It was quite a struggle to decide which idea we wanted to pick. After a lot of discussion, we went for the lucid dreaming concept. There were a couple of reasons why we chose this subject. One of us was already familiar with lucid dreams and had some experience. Others were interested in psychology, which has a lot to do with dreaming, as they are strongly connected to your personality and characteristics. Another reason was that we thought there were not a lot of products on the market for lucid dreaming. We could see high potentials for certain products, because, as mentioned earlier, lucid dreams have a lot of benefits. In addition, it was not a very obvious direction of sleep to go in, which made it a bigger challenge for us - in a positive way.

Research

Lucid dreaming is a concept that many people do not know a lot about. If you have not experienced it yourself, it could sound unrealistic or vague. Dreams are personal and not tangible, which makes it complicated to work with. Despite the fact that we had an experienced group member, who knew a lot of background information, we decided to dive into the topic of lucid dreaming.

In lucid dreams, you are aware of the fact that you are dreaming. You are still asleep, but you are also conscious. In 1981, it was scientifically proven by Stephen Laberge, that you can be in this conscious state, during REM-sleep. REM stands for Rapid Eye Movement, which is the dreaming phase in your sleep cycle. It is said that Tibetan Buddhists have been practicing this kind of dreaming for thousands of years.

When you are lucid, you can control your dreams. You can compare the experience to wearing virtual reality glasses. It feels like you are there, but you know it is not real. Lucid dreaming can be used just as entertainment, as you are able to do anything you want. Because it is possible to expose yourself to your fears, it could help to overcome fears or deal with trauma. Even though it feels like a real experience, you know the situation is not real. This makes it less frightening.

Lucid dreaming is something that can be trained. There are several techniques and methods that will make it more probable to realise that you are dreaming, in your dream. This point of realization is where you can become lucid. It is difficult to prove scientifically that such methods work. However, there is an enormous amount of people who have experienced the positive effect of using these tricks. Four common techniques are: 'dream recall', 'reality checks', 'external stimuli' during the night and 'wake-back-to-bed'.

Dream recall means documenting your dreams. It is useful to think about your dreams a lot, because you might find recurring themes or dream signs (people or items that often appear in your dream). When such a theme or sign pops up in a dream, the chances that you realize that you are in a dream, are higher.

Checking whether you are awake or asleep, multiple times a day, is what you do with reality checks. The purpose is making it a habit to continuously ask yourself: am I dreaming or not? When you do this often, you will do it in your dream, as well. If you are in a dream during a reality check, you will realize that you are dreaming.

External stimuli are small triggers would not wake you up, but make you more conscious in your dream. It turned out that there were some products on the market already for this. Reviews of these products were very divers; some said it really helped and others did not have such a good experience with them. However, we could get some inspiration out of it. We thought of looking at it from a different angle, or improve the devices that already existed.

Another way to stimulate the process, is the so-called "wake-back-to-bed"-technique. It is based on the fact that you are dreaming the most in the last two hours in of sleep. You wake up, two hours before you really need to wake up, stay awake for a little while - and perhaps write down a dream you had - and then go back to sleep. In this way, you will fall asleep consciously and then dream more consciously, as well. This makes it more probable to make you aware of the fact that you are dreaming.

Apart from getting information about stimulating techniques, it was important to look into existing products for lucid dreaming. There were several devices on the market that provided external stimuli. An example is a sleeping mask, with LEDs implemented. The LEDs would light up during your sleep, so you would see them in your dream, as well. This should trigger lucidity.
For dream recall and reality checks, there were some phone applications. However, they did not look inviting nor professional. Wake-back-to-bed is less well-known and we could not find anything that would help you with that.

Target group

After getting more familiar with the idea of lucid dreaming, we came up with a few concepts. We mainly focused on products that would provide triggers during the night, like the LED sleeping-mask. We could improve this device by making its timing more precise, and adding sound to the trigger mechanism. Another idea was creating a bracelet that would measure your body temperature and heart rate to recognize your REM (Rapid Eye Movement, the stage of sleep when you are dreaming) sleep and then buzz as a trigger to become lucid. We drew some of the ideas and presented them to the tutors, coach and group.

In the meeting with the coach and tutors, we got the feedback that we could consider our product as a helping hand. Instead of focusing on the triggers during the night, we could help people in the early stages of the process. We decided to create something to help people learn lucid dreaming in a more accessible way.

Our target group was now defined: we would focus on beginners. People who were eager to learn lucid dreaming, but had not experienced any lucid dreams yet. Because learning how to lucid dream is a process that can take a long time, this means that these people need to invest quite a bit of their time and effort before getting the reward of their first lucid dreams. We thought it would be interesting to design something that would make this process easier and more fun.

We all agreed upon that the group members who did not have any experience with lucid dreaming, would involve themselves in the learning process. They would document their dreams and do reality checks. This was useful to be able to empathise with our target group. Moreover, in this way, we would be able to use our own experience, when making design decisions.
We decided to focus on doing reality checks or keeping a dream journal, because these could be considered as the 'first steps' of the lucid dreaming process. Moreover, trigger-based device would be really hard to do user tests with because you would need to test during someone's sleep.

After the final demo day, I experienced my first lucid dreaming moment. I dreamed about a friend who died three years ago, so I knew it was not real. I actually did a reality check, saw my own hand - with only four fingers - and woke up. I would like to train myself more, to have longer and stronger lucid dreams. - Josefine

Before doing dream recall, I could only remember about one dream, every three weeks. When I started documenting my dreams, I could remember my dreams every night., somimes even multiple. - Emma
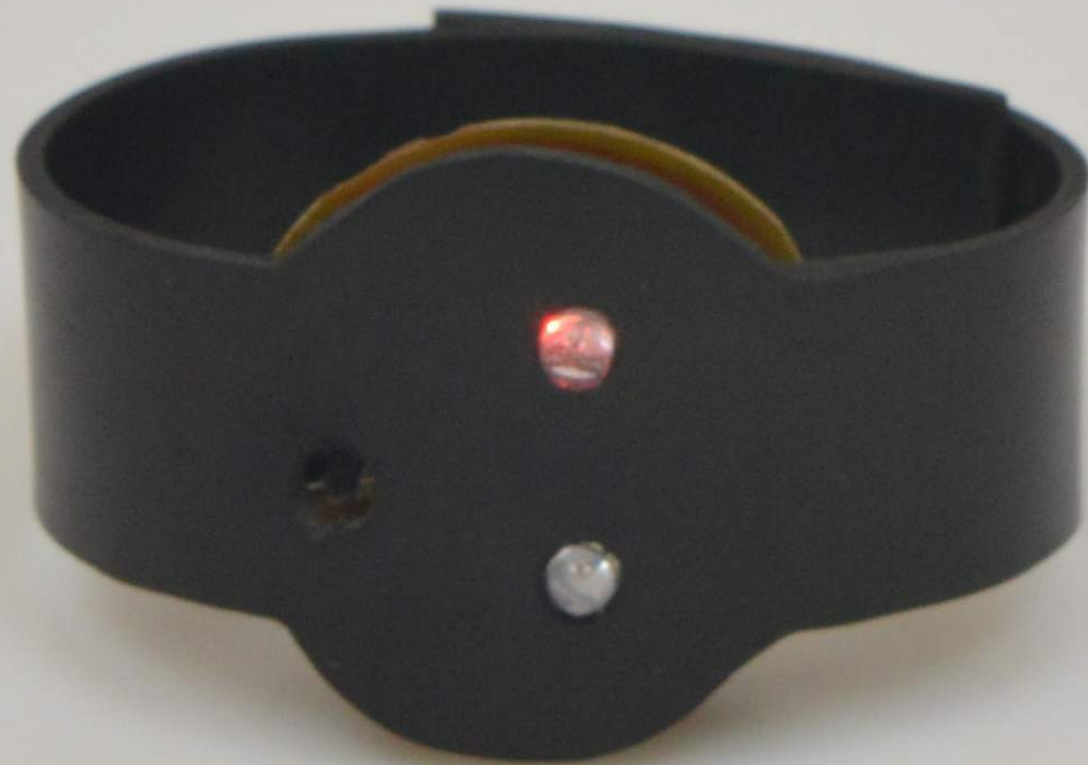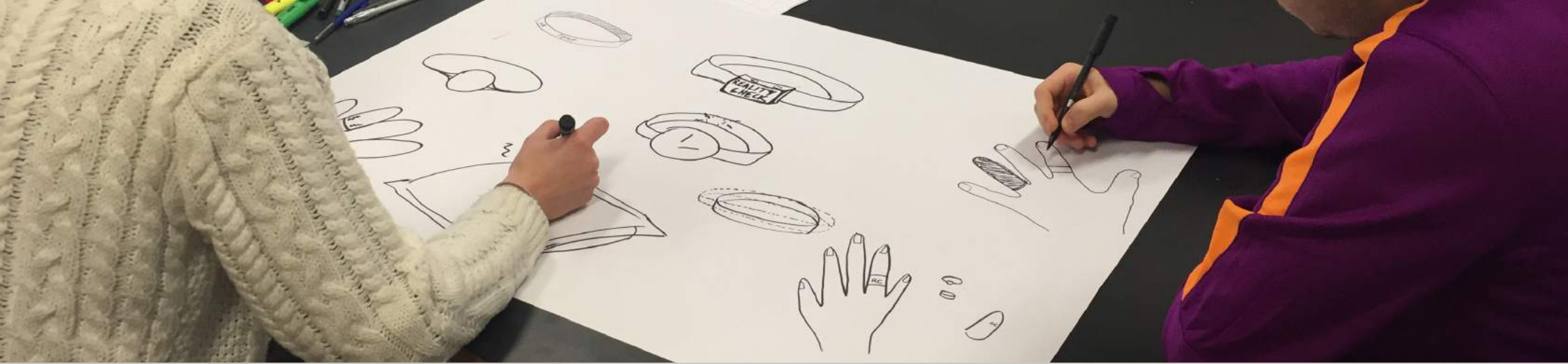
First design

We decided that we wanted to make something that helped people both with doing reality checks, and help them to keep a dream journal, instead of focusing on one of these aspects. In this way, you are more likely to succeed in lucid dreaming, which was the goal of our project.

Ideation for reality checks:

In order to find out the best way of integrating the reality checks in people's lives, we made a mind map that we drew our ideas on. Most devices were wearables, like rings, necklaces and watches, that would trigger doing reality checks throughout the day. Having visualized this, we came to the conclusion that a watch would be the most convenient. It is something that a lot of people already wear, both men and women. The other devices would be easier to lose or to forget.

We thought of a watch or bracelet, that would ask random questions, like: "How did you come here?", multiple times a day. In a dream, you would not be able to answer that question, which would make you conscious.

Later on, we came up with the idea to make a similar device, but with some adaptions. Instead of a question appearing on an LCD screen, there would be three LED's on the watch. They would light up, one by one. Each LED would light up in a random color (red, blue or green). In this way, you would have a certain color code, like: green-green-red, or: blue-green-red. The user would need to concentrate on the code, and then look away for a couple of seconds. The same code would appear and the user would check whether the code is the same as the first one, or not. In a dream, such a reality check would fail, at least 95% of the time. Technology does not work consistently in dreams, just like reading a text twice.

The use of LEDs would have quite some advantages, compared to an LCD screen. First of all, it would be cheaper, because the technology would not cost a lot. In addition, it would be achievable to realize, which we stated as a learning goal of our project. Another advantage was that you would not have to answer multiple questions during the day. Remembering a color code for a short period of time would require less effort.
The realization of this bracelet will be described in the realization part, later on.

Ideation dream recall:

For the dream recall aspect, we came up with a variety of ideas, as well. For example, we considered creating an online platform with strangers or friends, where you could share your dreams. Another idea was making something more competitive; like a game. We also thought about developing an application in which you could document your dreams efficiently.

We made a separate WhatsApp-group chat in which we shared the dreams that we could remember, right after waking up. We thought it could be motivating when people you know are keeping a dream journal, as well. However, we found that some dreams are too private to share with others. In addition, reading other people's dreams is not always that interesting. They often involve locations or people that are familiar to them, but do not mean anything to you. Thus, it is hard to imagine what their dream looked like and felt like.

With this experience in mind, we wanted to create something more private, that would be easy to use, as well. We doubted a little bit about making an app, because nowadays, there is an app for almost everything. However, it would be an accessible way to document your dreams, as almost everyone has a smartphone nowadays. Developing an app would not cost a lot of money either. This is why we chose to go for an app.
The app would have several different aspects. These are: recording your dreams, statistics, picking a random dream and an animation.
The most important one: you would be able to write down your dreams or use voice record, and save them in the app. Afterwards, you could read them back or listen to them again.

Apps that involve statistics, like Strava or Sleep Cycle are popular, nowadays. We thought it could be motivational when, for example, you see you are able to remember more dreams than the month before.

To connect the app and the bracelet, there would be an unrealistic animation in the app, representing a random dream. In this dream, you could see someone's arm with the bracelet and then a reality check would be done. Looking at this, would stimulate you to do the same in your dream.
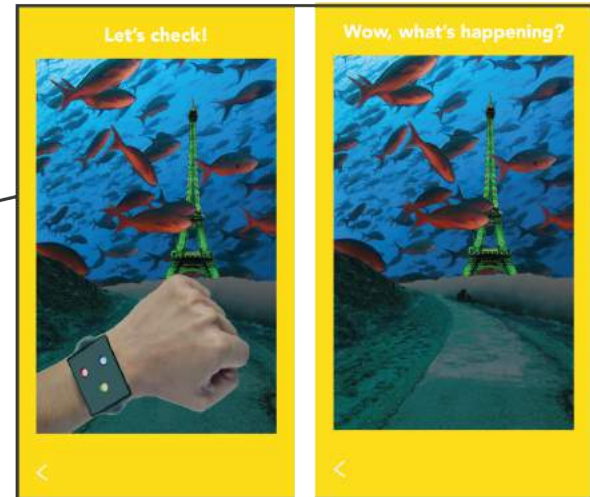The option to pick a random dream you recorded before, would be a fun way to stimulate dream recall even more.

To visualise the ideas, we drew the app interfaces on a big sheet. After that, we created the app interfaces on the computer and made a proxy application, using InvisionApp. In this way, we could show the functionality on a phone, which would make it much more realistic. Apart from that, we made a poster that explained the functions of all of the screens.
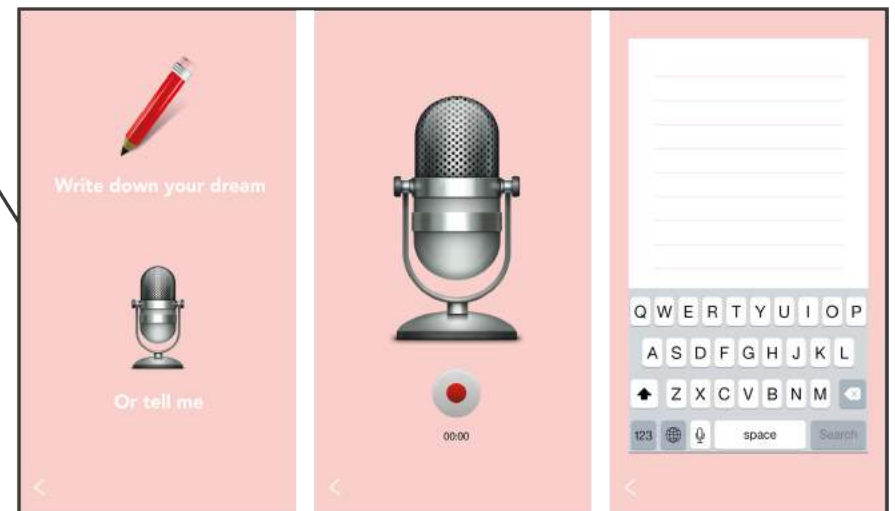
Pick random dream

Pick a random dream and watch the animations belonging to that dream

Let's check! **Wow, what's happening?**

Watch random crazy animations and tap to see the reality check wristband. This will stimulate you to do reality checks in odd situations in your dreams

Track the progress of your dream recalling skills

Statistics

amount of dreams recalled

10
9
8
7
6
5
4
3
2
1

1 2 3 4 5 6 7 8
weeks

Choose to write yown your dream in the note section or use the voice recording option

Write down your dream

Or tell me

00:00

Q W E R T Y U I O P
A S D F G H J K L
Z X C V B N M
123 space Search

Lucid Dream Trainer

Learn to dream consciously

Gain insight in your dream themes
and reoccurring dreams, by practicing
Dream Recall

Create awareness of your consciousness
during your sleep by doing daily
Reality Checks

Implementing feedback

On the midterm Demo Day, we presented our LED-bracelet and the application. We got a lot of positive reactions from people and quite a lot of them had either experienced lucid dreaming or were interested in learning more about it. There were a few questions that we got repeatedly:

Would it not be annoying if a bracelet would buzz every hour, to make you do a reality check?

What is the purpose of the devices; what is the exact reason why you would do this?

We also heard that the app interface could be improved, because it felt unintuitive and the image of the meditating figure seemed somewhat arbitrary or distracting.

Another important aspect was, that an application on your phone might not be the smartest idea. After waking up, you usually forget your dreams within ten minutes, or less. It is important to stay focused on what you dreamt, in order to remember as much as possible. If you would use your phone early in the morning, to record your dreams, you might be distracted easily. In this way, recalling your dream is more difficult. The feedback we got, was about perhaps making the dream recall part tangible and not digital.

To answer these questions and see where we could improve our product, we set up user tests.

When we got the feedback of making the dream recall part tangible, so one could interact more with it, we needed to make some design decisions again. We needed a concept, a shape, materials, size et cetera. We came up with the following; we could make orbs, that you could tell your dream to, save them in and then listen back whenever you want. It would look playful and fun and it would be easier than writing it down.
Within the group, there was some discussion about whether to make the dream recall tangible or not. Of course, an app has the advantages of being cheap, easy to modify and expand and accessible, since everyone already carries a smartphone and would only have to download an application for it. A tangible product would have added value because it would be harder to get distracted from it, and because the interaction would be much more playful.

We bought some foam orbs and made the first low-fi prototype of the idea we had of the dream recall orbs. We then did a user test with other students. We wanted to know whether they would prefer an app or a tangible version of dream recall. People were very positive about the tangible version; they liked the shape and the idea. It was considered to be more personal and fun. Most of the critical feedback was about privacy; how are you going to make this product that is full of personal stories both accessible for the user and private for the rest of the world? We thought of including touch ID or a code on a docking station for this. Another aspect was the costs. It would be important to use technology that would not be too expensive, because otherwise, people were not willing to buy them. However, they were willing to pay a lot more for a physical product than for an app (for example: 2 euros for an app and 40).

For the reality check bracelet, the main concern people had was that it might be annoying to have a watch that vibrates every hour. We did a small user test to find out if this would be the case.

We used an existing product: the Wobl watch. The Wobl was originally designed for elderly to remind them to take their medicine every hour, or young children to go to the toilet every hour to prevent accidents. The Wobl could be set to give vibration alarm on a chosen interval, every hour in our case. We used several users, including Jesse and Josefine, to test the Wobl for several days and found out that one reminder per hour doesn't influence daily activities in a negative way. No One said they were annoyed that the bracelet would vibrate hourly, but rather by the length it would keep vibrating. Moreover, from this user test we found out that comfort and esthetics are important to the user, especially if they are going to wear it all day. Concluding, hourly vibration was not a problem. 15 Seconds of vibration however, turned out to be way too long. This time could be shortened to 2 or 3 seconds in order to make it less distracting and more user friendly.

Realization: reality check bracelet

For the reality check bracelet, the concept was clear. As mentioned before, the bracelet would vibrate multiple times a day - once an hour - to remember you to do a reality check. Then, the you would press the button a code would appear two times. The code would consist of 3 random colored lights, with a random order of appearance. After the color appeared for the first time, it would be repeated by the bracelet, and the user is supposed to verify whether the code stayed the same (as it does in the waking state), or it changed (like it would most likely do in a dream).
For the Final Demo Day, we also made an animation that showed how the bracelet would be used in a dream, making the dreamer become lucid. We chose to do this to make our concept more clear for people who were new to lucid dreaming. It could be hard to understand how an experience like this feels.

We tried to build all the electronics, using an Arduino Uno and a breadboard, so we could show it during the midterm Demo Day. We were able to write a program that showed a random pattern of 3 lights, and repeat it afterwards. Though, at that stage we were not able to integrate a push button to start the pattern. It could only be switched on and off and it would keep doing random color codes.

In order to create a wearable bracelet that was fully functional, we first had to choose a smaller Arduino, because the Arduino Uno was too big to implement in a normal-sized bracelet. There were various choices that were small enough to make them wearable, but we went for the Lilypad Arduino, because of its round shape. This resulted in a smaller bracelet, because all of the electronics could be directly soldered onto the Arduino.
At the same time, we continued improving our program. Programming is a lot of trial and error. With previous knowledge, help from others and using information from the Internet, the program worked; after pressing a button, a pattern of 3 lights would be shown and repeated once. At this stage we were still using the Arduino Uno and a breadboard, to test if everything worked properly.

We were quite sure that the Lilypad Arduino would be the best one to use for this project. It is designed for wearable projects, and it has a round shape. The Lilypad comes in 4 variants. The Lilypad SimpleSnap had an integrated battery, which would be very useful for our device. Unfortunately, it did not have enough outputs to be able to function properly. Another variant, The Lilypad USB, was the easiest to pair with a computer in order to program it, but just as the SimpleSnap it did not have enough outputs. The only option with enough outputs, was the Lilypad Main Board.

There some difficulties, regarding the Lilypad Main Board: it could not be linked to the computer with the cable we used for the Arduino Uno, and there was no internal battery, like the SimpleSnap version had. After some online searching, we were able to solve these problems. We brought an FTDI cable to be able to connect the Lilypad to the computer and a small lithium ion polymer battery (3,7 V 150 mAh), which was compatible with the Lilypad. We had to adjust the program a little, mainly because the output pins where different from the earlier version we made with the Arduino Uno. On the Lilypad, we tried to put the LEDs in an equilateral triangle. This would, in our opinion, be aesthetically pleasing.

At this stage in the process, the program was able to control the LEDs in the way we wanted it to. We used RGB-LEDs and soldered a resistor to each of them, to prevent that they would burn through. It was still powered by the computer, because we wanted to test the functionality of the LEDs, before adding more electrical components to it. We tested every component's function before adding more components. Taking out malfunctioning components, could damage components that work properly.

The next step was adding the push button to the circuit, to be able to control when the pattern would be shown. We used the data reader function in the Arduino software to verify which input values we had to use to make the push button work.
The button did not work initially, so we had to rewrite some parts of the program. We also had to isolate the push button to prevent it made contact with other electrical components, to prevent shortcuts or other dysfunctionalities. After testing the button again, we could finally add the battery, along with a switch. In this way, the battery would not get drained instantly.

After the technological part was finished - except for the vibration function - we focused on the aesthetics. We used dark blue transparent perspex for the housing of the electronics. This material lets the lights shine through, when a reality check is performed, and the electrical components are a bit visible. We thought this made it look interesting. The housing was cut with a fretsaw, and after that we drilled the holes in the right places.
For the band, we cut a piece of rubber with a whole in it, which was slightly smaller than the electronics were. With a small force, it could be placed over the electronics and stay in place afterwards. The perplex housing would then be placed on top of the rubber band and the electronics.

Later on, we decided to change the design slightly. We wanted to make it possible to put it on and take it off easily. Therefore, we made a simple locking. In this way, the bracelet would stay in place around your wrist, as well.

We were not able to implement the reminder function in the braclet. The bracelet would remind the user to perform a reality check once an hour, by vibrating shortly. The reason we could not implement this, was not having enough time.

Realization: tangible dream recall

We quite agreed on the shape; orbs. It matches the round shapes of the bracelet (the LEDs are round, seen from above, and the watch as well). In addition, it feels comfortable in your hands. We discussed more about whether we would like to have one orb, that contains all your dreams, or one single orb for every separate dream. The advantage of one orb would be that it does not take a lot of space and it would be cheaper. On the other hand, having one orb for each dream matched our purpose more - having a tangible version of your dreams. You would be able to 'see' your dream collection right away.

In a meeting, we came up with an idea for one orb, which worked as follows. There would be an orb that is able to record your dreams. You would have a screen that you could put your orb on, and your dreams would be visible on the screen. Then you would be able to drag your dream into the oeb and choose to listen to it. A collection of your dreams would be on the screen; the rest of them would be exported to your computer, so you would have all of your data stored. When we presented this idea to our coach, we got the feedback that is was too complicated and we would not even make a cheaper tool by using all of this technology. Also, because time was running out, we needed to keep our concept as simple as possible and realize it, instead of continuing with sketching and ideation.

After this meeting, we decided to divide the tasks within the group. One (Jesse) would work more on realising the reality check bracelet, and the other two (Emma and Josefine) were going to work out the concept of the dream recall.

Emma and Josefine continued with the dream recall concept. We took the feedback with us of doing instead of thinking. We made a bowl with foam orbs and next to that, we put a single orb on an improvised little platform. We asked several people whether they preferred one single orb or multiple. The reactions were quite versatile, so we went for what we liked the most: multiple orbs. The purpose was to make your dreams more tangible, and we thought having one orb for every dream, would suit this better.

The next step was to choose a material. We already had the foam orbs, and continued with those, because they were light and easy to adjust. We played around with them, to find out how we wanted them to work. To show and experience the functionality, we put earplugs in the orbs and used the phone to control the voice record.

The earplugs worked to show the idea of our concept, but it was not what we wanted for our final prototype. The idea came up to use the electronics from a record-a-message birthday card. In these cards, you can save and play a message for someone's birthday. We ordered a card, as well as a separate chip. The chip had a button for recording and playing; where the chip in the postcard would play automatically by opening it. We wanted to try out what would work better and what would be easier to implement in the orbs.
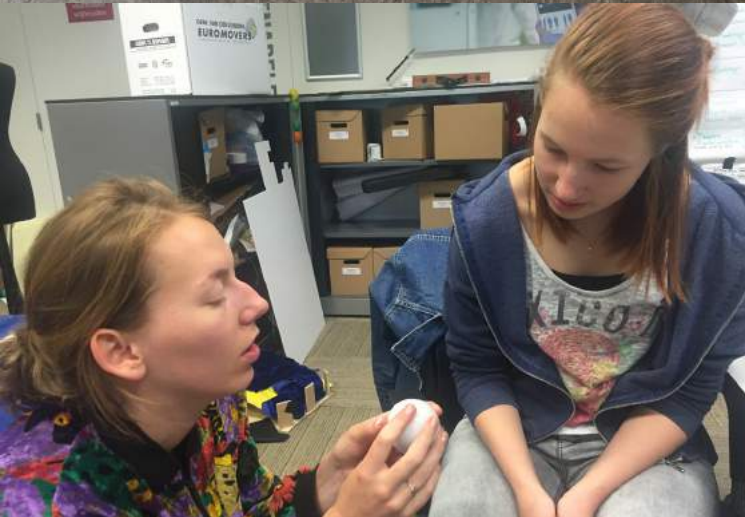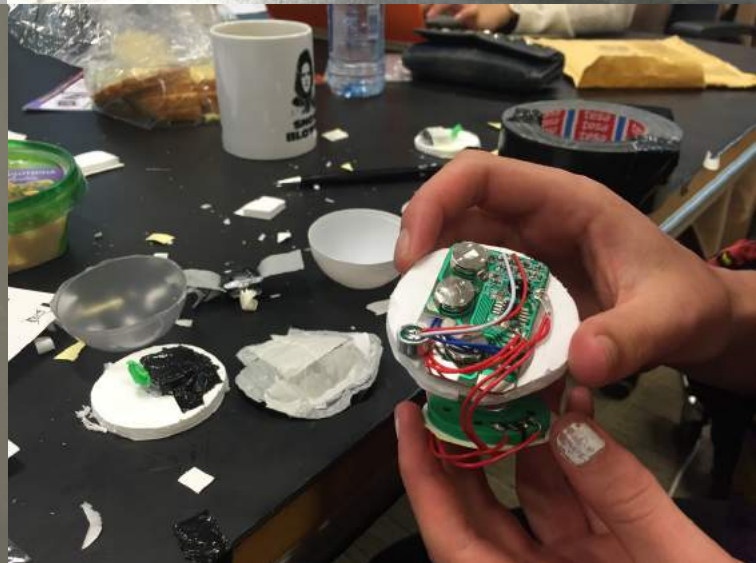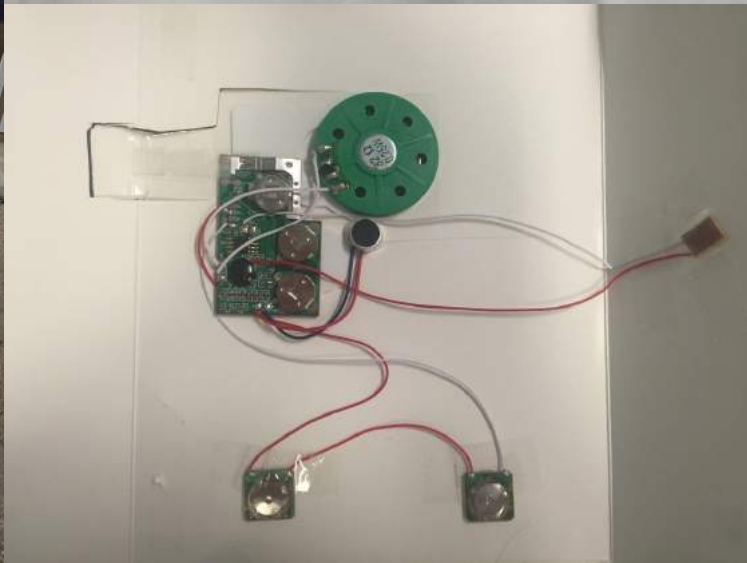
It took some time for the electronics to arrive, so we focused on the aesthetics again. It was a process that involved a lot of trial and error. The foam orbs had quite a rough structure on the outside, which we did not like too much. We were also considering painting them in different colors, and that would probably not work out well on foam. A variety of colors would look more playful and it is an easy way to distinguish different dreams.

Just to try it out, we chose to work with plastic orbs. These look smooth and a bit more sophisticated than foam. To make the paint stay on better, we wanted to sand them. We tried sandblasting an orb on the inside and one on both sides, to compare the looks. It turned out that the first orb looked interesting, because of the shiny outside and the matt inside. The other ones looked a little bit dirty. Other people told us they preferred the shiny outside as well, so we went for the half-sandblasted orbs. To see what they looked like painted, we tried white spray paint. It turned out they looked pretty, a bit like pearls or sea shells. Another important thing is that it gave us more confidence about our abilities to build things. Within little time we had done sandblasting, sanding and spray painting. It was not as difficult as it seemed and useful to learn.

More or less by accident, we found out that implementing a small light could be a good idea. We took some colored paper and put it on the flashlight of our phones, shining into the orb halfs. That idea appealed to us even more; spray painting all of the orbs with white paint and then adapting the colors with different colors of light. First, we wanted to build our own LED circuit, but we were struggling with the batteries. The solution we found, was using small LEDs from bicycle lights.

To put in all of the electronics, we used foam board. We cut out the spots for the electronics, glued them on and left one side of the foam board intact. In this way, the orb halfs were covered and the electronics implemented invisibly. There were were lights attached, which we soldered off. Again, we used different techniques and materials, which we had not done to this extent in yet in such little time.

Overall results

The final outcome of our project is Somnia. Somnia is a combination of two devices, that support the training process of becoming a lucid dreamer. With these tools, we want to make this process more accessible, easier and more fun for people.

The first tool is a reality check bracelet. By using this bracelet, you are encouraged to do reality checks on a regular basis. It will ask you to remember a color code for a couple of seconds and check whether it is the same, the second time. Because it looks like a watch, it is a device that is supposed to be suitable to wear in everyday life.

The other part of Somnia consists of dream recall orbs. In these orbs, you can record your dreams so you can listen back to them, when you want to. The orbs light up, when a dream is stored inside. You can re-record a dream in the same orb, or buy as many of them as you wish to. It depends on how many dreams you consider important to keep stored.

An average day in your life as a user could be as follows. You wake up and dreamed about something. In order to remember the dream, you grab an empty dream recall orb, tell your dream, and put it back. You will put on your reality check bracelet and start the day normally. Every hour, the brace-let buzzes and you will see three LEDs light up in a random order and colors. It pauses for a couple of seconds and then repeats the same code. These reality checks will be done throughout the day. When you go to bed, you take off your bracelet. Before you go to sleep, you listen back to the dream of last night. You might dream about the same person again, which makes you realize that you could be dreaming. Listening to the previous dream helped in remembering this. You do a reality check in your dream and become conscious. Now you are lucid dreaming.

It is important to know that reaching this stage might take months. Though, the process will be easier with Somnia.

somnia

Learn to dream consciously

Conclusion

Our project goal was to guide people through the process of Lucid dreaming, and to keep them motivated to practice. We based our design on existing lucid dream training techniques, which people have used for dozens of decades, so we are positive that the process would actually lead to it's goal.

It turned out to be difficult to guide people through the process step by step. Because learning how to lucid dream is something that is very personal and works differently for everyone, it is difficult to give a 'one size fits all', step-by-step solution. Instead, we provided the user with a set of tools to make the process easier and more fun that they can use whenever suits them best.

In terms of keeping people motivated to practice lucid dreaming, it is again difficult to give one definite conclusion. Some people might like the product in the first place, but still lose their interest in lucid dreaming in the long term. Others might not find our product useful in the first place. However, we can still say something about how useful our design is when we look at the reactions people gave. Users gave us feedback, on which we based the next iterations, constantly improving our design. Many people we enthusiastic about the products we showed them.

So once again, it remains very personal whether or not someone will find our product motivating, but we believe we came up with a solution that will work well for a large number of people.

Group reflection

The project in the past semester, was the first design project, for all of us. Everyone had their own learning goals, but we had to develop as a group, as well.

In the beginning, we learnt the most about collaboration. The group work started off roughly, which made it difficult to really start the design process. After a couple of good meetings, we improved in approaching the process more efficiently and professionally. The most important aspect to this, was clarifying everyone's expectations to one another.
By setting and discussing our individual goals, we found out that they something in common. We all wanted to create, learn prototyping techniques. Focusing on where we wanted to go, should improve the collaboration. In prospective group work at university and companies, we can use this knowledge to stay focused on our goals and how to get there, together.

Another thing that we learned in the beginning, was using ideation techniques. Time boxing worked out well for us, because we felt like we could think freely, without limitations. This is something we will take with us, in future projects.

A very important conclusion we could draw from this project, that it is really useful to start making in the early stages of the process. In our design process, we were stuck in the ideation phase for quite a long time. Later on, we learned a lot, by making our concepts tangible. Prototyping and playing around with materials, shapes and sizes, makes it easier to improve your concept. In addition, you can do user tests with your prototypes, which will often provide useful feedback.
In the future, we would like to start prototyping, from the beginning. Even if it is a simple, low fidelity prototype, it will lead you to new or improved ideas. Apart from that, you have more time to improve the quality of a prototype, if you start making the simple versions early in the process.

Dividing the tasks after the midterm, was a good decision. We could all work on what was the most interesting for us, and that had a motivational effect. Perhaps, we should have made a clearer division of tasks, earlier in the process. That would have been easier if we would have had a more concrete concept and if we had not been stuck in the ideation phase for that long.

For all of us, the pitching workshop turned out to be useful. It was a workshop, organized by the university, right before the Final Demo Day. We learned that pitching is more about engaging the audience, than about explaining your concept completely. We could use the tips and tricks that were explained in the workshop for our pitch at the Demo Day. They will definitely help us in other situations where we have to pitch, as well.

Even though the first part of our project was a little tough, we managed to develop a concept and partly working prototypes that we can be proud of. We implemented technology in the devices, used both digital and nondigital ways to demonstrate our concepts and took more professional photos than in the beginning. Looking back on the process, we have grown, both individually and as a group.

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All images used were made by ourselves.