TECHNICAL DOCUMENT

A VIRTUAL LIFE COACH FOR ADHD STUDENTS

In my research, I studied how a data-driven virtual life coach can give life structure to college students with ADHD. This enclosed technical document outlines the design process for creating the graduation assignment prototype.

This document shows the 3 different iterations and decisions made towards the final prototype.

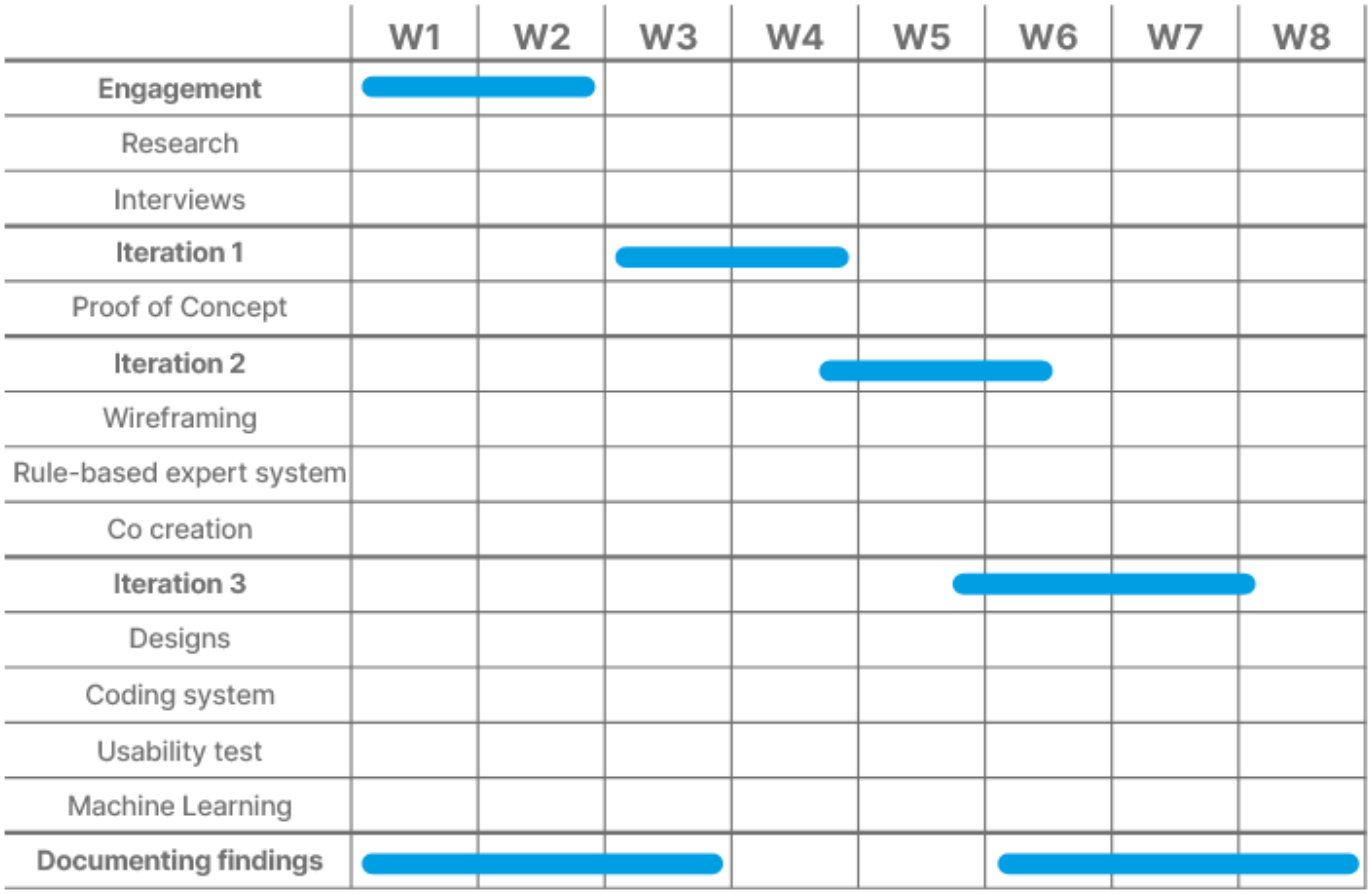
You can find all data, designs and code on:
https://github.com/Daan129/virtuallifecoach

By Daan den Otter

CONCEPT

The data-driven virtual life coach (VLC) will help ADHD students create structure in their inconsistent lives. The application uses the time-blocking method to start with a basic framework of their week based on their calendar and preferences. The student can set goals to help them build their routine. It takes data of the user's behavior and feedback to optimize the student's schedule by learning and anticipating their personal cycles. User behavioral data is described as how the user interacts with the system and deals with the proposed plan. User feedback data is described as ratings the user gives about their mood during the day. The app stimulates the user to stick to their schedule and obtain their goals by sending tips and motivational messages notifications. The students can monitor their behavior by seeing an overview of time spent on activities, goals, and mood. They can also share this data with their clinician. The VLC will learn from the users' interactions and improve the service every time the student uses the app. Therefore, the data-driven feedback loop plays a critical part in the process since it collects data from the user to create a better, more personalized schedule. The goal of the VLC is to form the foundation of the ADHD student's days, which will help them focus better and have the feeling of owning their hours of the day again.

Planning



ENGAGEMENT

The research uses a co-creation approach, which means that the stakeholder's engagement plays a huge role in the process. A target audience group was composed to establish meaningful relationships. The eventual group throughout the whole process consisted of 3 ADHD students and 2 therapists (2 of them interviewed at the same time). 1 more therapist and 3 more ADHD students also participated in the research. However, they could not be involved during the whole process because of difficulties.

Interviews ADHD students

To start connecting with the stakeholders and understand their needs, interviews were held. The goal was to understand the different life components where other patients struggle with. The interviews also gave good insights into how ADHD students tried to deal with their symptoms and what things worked and didn't work. It was great to start relationships with people interested in helping the project further. They also felt attached to the project since they were involved during every iteration.

The most notable thing that became clear was that every student experienced ADHD differently. It was a revelation to see different kinds of takes on handling symptoms. This mostly showed how important the involvement of the patients is. It also made me realize how I was already too focused on a specific solution in my head. Therefore, it made me zoom out to explore the field further.

The interviews also made me look for similarities between the different ADHD students. The most important similarity was how much ADHD students were already trying very hard to deal with their symptoms. One respondent said: "If I want to get something done, I have to think about it very carefully. I must have a good plan for that. Do I have to work systematically? Yes, and I can go a long way in that. I should find some kind of balance in it." It gives insight into the effort it takes to execute a task. They all said that they have to spend much time on how they will perform those tasks, and it takes structure and routine to keep doing this for a more extended period. Therefore, there is a big chance that they won't make a planner because they already have so much more things on their mind. Even when they know it's for the best, they skip it anyway. Which caused me to focus on two things: 1) be an aid in creating and maintaining that structure and routine, and 2) let it take as little time and space in their head as possible. Another similarity is the unannounced events that happen during the day and interfere with their rhythm. When a meeting is running late, when they are distracted for a while, and they have little time left for their task, or when temptations come across, they lose the feeling of having control of their time. It is almost impossible to motivate themselves to go on with their day.

After each interview, a case study was done where the students would show how they scheduled their next study day. It showed that I didn't really have a customary routine. One student showed something similar to time blocking. Another student would tell themselves to focus on one particular task or activity for a whole day or until it's finished. The last student did not plan their day and would just start with the first thing he thought had priority. All students had trouble with the time it costs to schedule their day and the chance of events happening throughout the day, causing the schedule to be invalid.

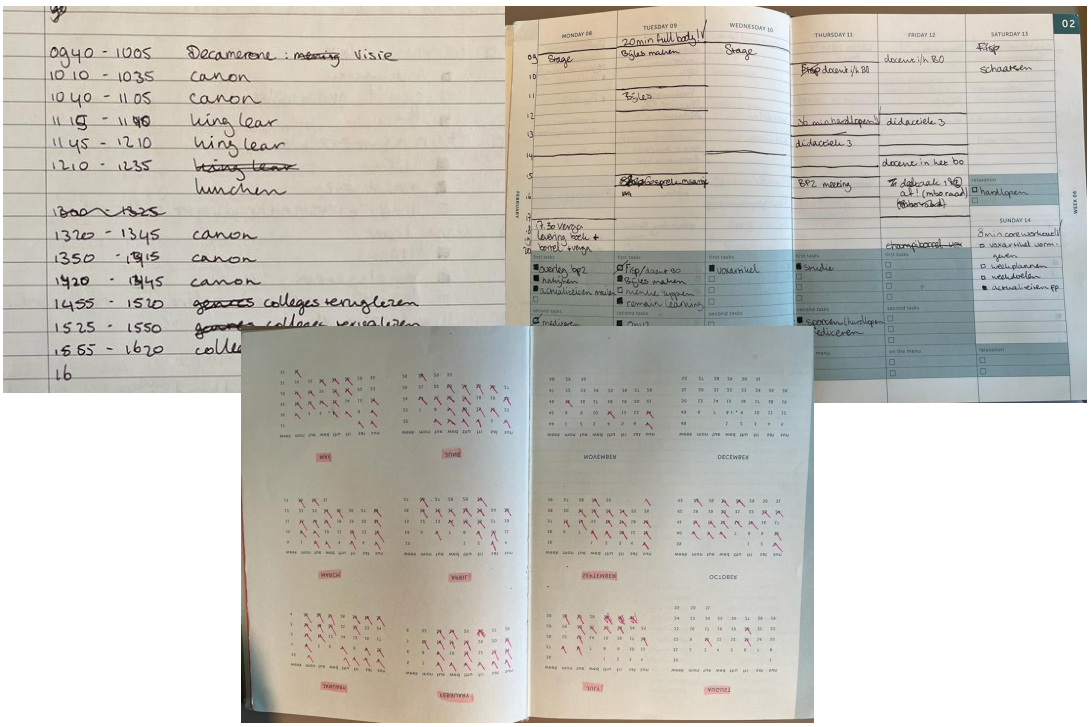
Interviews experts

In total, 3 experts involved in ADHD treatment were interviewed. In one interview, 2 experts were questioned at the same time. The goal of these interviews was to better understand how a virtual life coach could play a role in treatment. The experts gave interesting insights about how different each ADHD student is and what techniques they use to start with and work most of the time. They always stress the importance of routine and structure to the students. However, when the patients are done with therapy, it is up to them to maintain those techniques.

The patients learn such techniques themselves with the ADHD coaching interventions. The interventions teach the patients to deal with their symptoms. However, by only seeing the patient once a week, the therapists have to catch up about the course of the patient's week. Therefore the insights could be biased for what the patients remember at that moment and how the patients feel emotionally. There is always a gap between what the patient is telling them and what they actually experienced. Better insights about how the patients feel are desired.

They used time blocks to make the schedule easy and understandable to create a routine. When a schedule is too packed with specific short tasks, it would be perceived as information overload. They also used a brief overview of the biggest tasks in the morning, afternoon, and evening. The most important part of making the schedule understandable is visually attractive and legible. This will motivate the patient to be encouraged to keep ongoing.

The therapists also expected that reflection would be a good way for the students to become more mindful of their hours. Something that they try to do themselves the interventions once a week.



Examples of students' scheduling methods

ITERATION 1

In the first iteration, the concept was tested from beginning to end. This meant that all stakeholders had to be involved, and they already understood how the application would work. The idea was tested with the Wizard of Oz method to quickly create an effective prototype without designing an actual product.

Proof of Concept

The proof of concept was tested using the Wizard of Oz method. The iteration can be divided into 4 steps:

1

Creating a platform with Google Spreadsheets

To create a first platform to work with, I used Google Spreadsheets. In Spreadsheets, it is easy to make and share a visual overview of the day. A day planner was created from scratch that could be filled in by the different categories of activities that came from the interviews. Colors were used to differentiate through the different activity categories and visually establish the different time blocks in the planning.

2

Getting data from the ADHD students,

The students were asked to keep track of everything they did in the spreadsheets for a full day. The students also gave a summary of how they felt and rated their mood. This way, the therapists would already understand how the students move throughout the day to anticipate.
The students were also asked to give a new (similar) day that they prefer to have scheduled out with the additional obligations as meetings and appointments.

3

Creating a new day planning with the therapists,

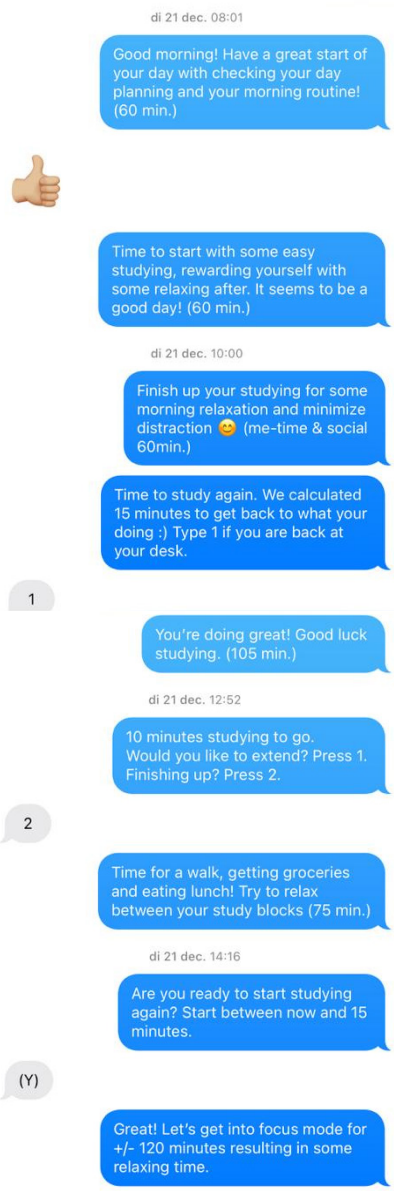
The therapists were asked to 'play' the system by scheduling the new day for students using the time blocking method. The idea behind this is that there is structured chaos. By which is meant that when ADHD students go into their unstructured day, they may feel like a loose cannon at the end. Giving them a strict plan could maybe make them feel uncomfortable. To provide them with extra structure while letting them do their own thing could lead to a more mindful approach. Not everything can be planned from minute to minute. Even if it could, events during the day will invalidate the schedule, causing the student to reschedule their day. While using larger time blocks given a general activity, the student can focus on less upcoming hours.
The experience of the therapists and the limited information they got gave great insights into how they look at a day that they want to provide structure. The reasoning of the therapists was briefly summarized in the new planning.
During this step, notes were taken, and questions were asked to elaborate their reasoning.

4

Let the ADHD students use the planning

The students used the planning on their laptops and phones. During the day, I sent the students messages that usually would be sent by the VLC via iMessage, a messaging app from Apple that can be used on phones and laptops. This way, the students didn't have to open possibly distracting messaging apps that they used often. The messages reminded the students of the beginning and end of a time block, motivated them, and could let the application know that they were delayed, distracted, or wanted to keep studying. I had to set a lot of alarms to not forget any messages. If something changed in the students' planning, I immediately changed it accordingly in the spreadsheet.

At the end of the day, the students were again asked how they were doing. After the testing day, further insights were gathered by a short interview.



Notifications to a user

Insights

Scheduling the day

Insights were collected about what therapists look at when they schedule a day. What to prioritize and how not to let the student overestimate themselves by making good use of breaks. However, while the categories were clear and steady, some tasks have overlapping categories (as they can go together with social, for example).
This basically formed the fundamentals of the algorithm.

First impressions

The look and feel of the interface were well received.
The students also liked that they could open the planning anywhere and on any device. The categories were clear, and the colors better understood the different time blocks.
The whole personal approach was very nice. Personalized planning and personalized messages.
Because the respondents trusted the planner, they could let loose the stressed feeling of wanting to be in control and start actually doing things.
They liked that the application suggested certain routines that they probably wouldn't think of themselves. Most of the time, they stick to their own habits of routine, which may not be the best for them. Therefore they could trust the application to try out new things.

Adaptivity during the day

Everything was easily changed when something happened throughout the day. So if something started earlier or something was delayed.
One respondent suggested a feature that knows when you wake up. So if you slept in, it would automatically reschedule your day. Another respondent indicated that it would be nice to start over with a panic button.

Notifications

The notifications/messages were handy reminders of the planning. One respondent really felt satisfied when a time block ended, like it was some sort of reward which motivated them to go on with their day. However, there is a chance that a blind spot.

Reflection

The respondents started seeing the benefits of reflecting on their day, which they have done for the second time now. They do stress that it should be as easy as possible. They could write a few sentences for now, but maybe that could be too much work over a more extended time. One respondent would have liked it if a specific option was to rate their productivity.

Results

This was the most helpful iteration since it had all aspects of the concept and had few technical limitations. It gave great insights into how the foundation of the app could work. With all very enthusiastic responses, I concluded it could. This made me take a more practical approach in the next iteration.

ITERATION 2

Now that I had tested the concept, I understood how the system would work and what aspect would be involved. The concept and idea started to take shape. So, the second iteration focused on the first steps towards the prototype by creating the design and technical side of it. Wireframes were created to start with the design of the prototype and the first version of the algorithm was written out on paper.

Paper algorithm

Co-creation

To execute scheduling a day with time blocks, the system needed an algorithm. The algorithm was written on paper to fully understand how the system would work. The goal was to create an algorithm that would think like the therapists. Therefore, the interviews and the scheduling in iteration 1 were essential in this decision-making process. Because of the lack of data available, I concluded that Machine Learning would not work to get the results I wanted. That's why a rule-based expert system was chosen. To demarcate the outcome, the algorithm would focus on an ordinary study day, the same as the first iteration.
The therapists always divided the day into 3 periods (morning, afternoon, and evening). The algorithm does this by using the user's morning routine, evening routine, lunch, and dinner times. This made it already easier to comprehend the hours and classify the activities.
After the first version was set up, the rest of the algorithm was tested with the therapists during a co-creation session. They tried different ways to use the system to test the outcome. With quick iterations tweaking, and testing the algorithm, it gained more structure. Most importantly, the algorithm served as a framework where other features and variables could "easily" be added on.

Insights

There were slight adjustments made to the algorithm in cooperation with the therapists. Because the algorithm is rule-based, the challenge lies in creating a personalized approach to make sure not everybody gets the same results. However, that made it all the more critical to serving as a framework to build upon. Thus, drawing the algorithm on paper first helped me gain a better overview of the algorithm and the variables involved.

Results

The algorithm on paper looks like it can do the work. Changes were implemented right away in consultation with the therapists, ready for development. So, the next step is digitizing the algorithm in Python.

Wireframes

The wireframes created an overview of the different screens and elements of the application. From the interviews, it became clear that a technology such as a VLC must be attainable everywhere. Therefore the most important device would be a smartphone, as you always take it with you. Wireframes were created for a mobile application, but future iterations could focus on other devices.
Luckily, the interviews and the first iteration results gave a good perspective of the priorities of the elements and how the application should be structured. The wireframes

were made clickable to provide the respondents with a more realistic approach during the usability test. The onboarding and account setup needed to be apparent to the user with the content. The onboarding consists of an explanation of how the system works. People needed to understand this well to connect better with the system and give it some time to learn from the behavior.
The wireframes were created using an iOS wireframe kit in Adobe XD. The screens were structured in the following categories: Sign in/sign up, onboarding, set up an account, home/menu, planning, progress, reflecting. The day planner was divided into two screens. One overview/summary of their day (divided in morning, afternoon, and evening) and one where the activities were shown hour-by-hour. The intention of creating two ways for users to interpret their day was to counteract an information overload. Since they had a way of solving their day with one look.

Testing

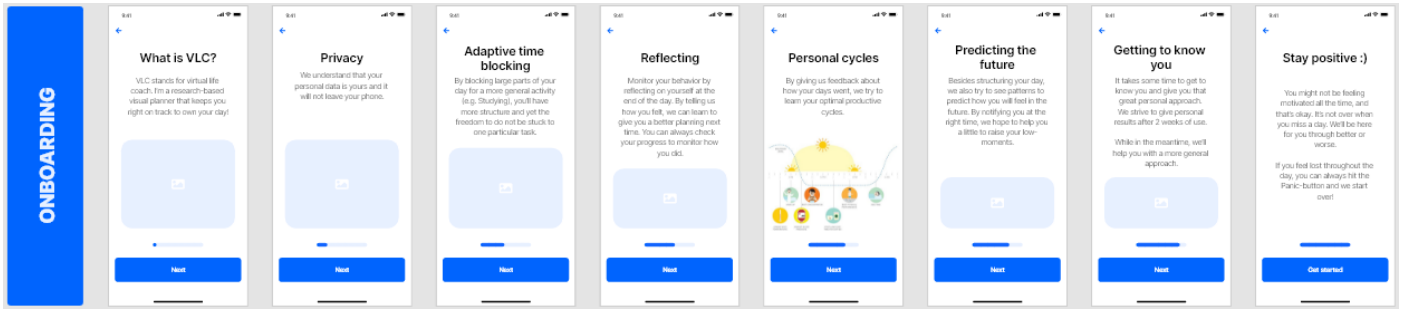
To make sure the users and I were on the same level of design expectations, I did a user test. To validate the process of using the product and get additional feedback about what the users miss in the application. At the same time, insights into the structure and usability of the prototype were gained. Content-wise, it was important that the onboarding clearly explained the product.
The sessions took place individually with 4 respondents (3 ADHD students and 1 UX Designer as expert). Due to COVID-19 restrictions, the tests were taken from a distance through a video call for 10-15 minutes. While the respondents already knew the concept, they got a short introduction.
The users were asked to look at the wireframes and give their opinion. They went through every page of the app and were asked if they understood the page's structure and/or content. After they viewed every page, they were asked to elaborate their opinions.

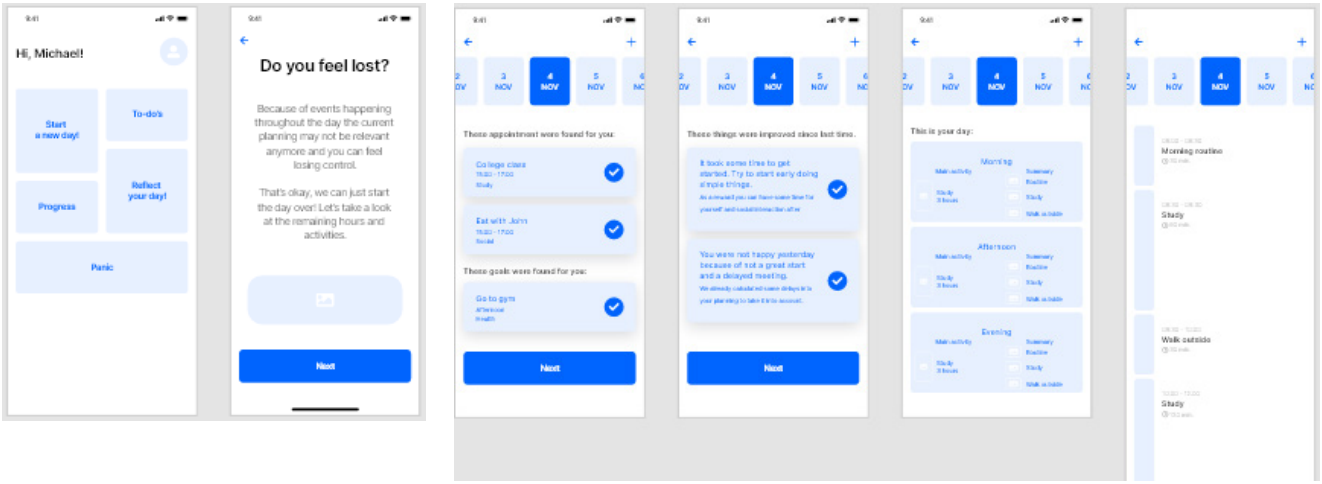
Insights

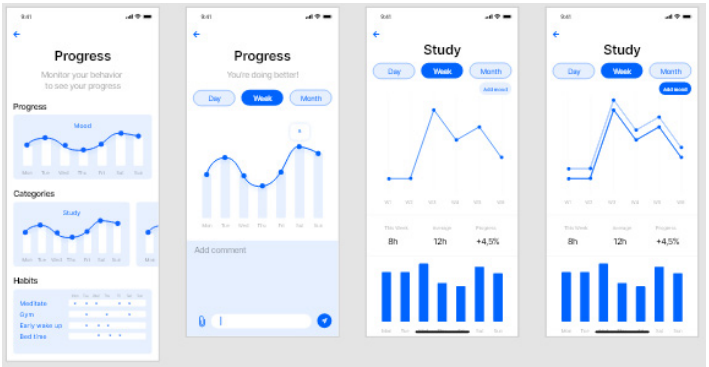
The overall first impression of the application was well perceived. Words used were: "clean, clear, not too much, compact." The pages' structure was good, except for a misunderstanding of the difference between the overview of the three periods and the actual day planning. Also, they did not understand what the checkmark would do on the page explaining the given choices by the algorithm. People were unsure how and/or if they could see the full schedule.
The panic button was an excellent addition to letting the user restart their day.
While the respondents understood the onboarding, they would skip such things in real life most of the time. Therefore, it had to be clear that users need to read it carefully, and maybe there should be an option for them to skip it right away and read it later.
Some of the insights were noted as important however they were outside the scope of the current test and research. For instance, the users asked if there would be a widget they could place on their home screen or see it on their Apple watch. Another respondent asked if the algorithm could find out how well you're doing for each of the categories and give a score to it.

Results

The user test was a great way to find out if the expectations of the product were the same for the ADHD students and me. Because the users must read the onboarding carefully, an extra screen was added to emphasize that. The screen has a button to skip the onboarding to read it later. Though, the user must always have read the onboarding before he could really start using the planner.
The checkmark would also change to a +/- button because the user would better understand that they can give feedback to the system about the choices made.
The misunderstanding of the two different views to look at your day was solved by adding a toggle button between the two.
The wireframes were ready to be converted to a high-fidelity prototype.







Impression of the wireframes

ITERATION 3

A concept prototype was tested with the Wizard of Oz method in the first iteration. This meant that the technical and visual sides were in the same test. In the second iteration, the two components of the prototype were separated, so focus more on the experts and users. For the upcoming iteration, I will bring the two components back together. The algorithm is created in Python, and the outcomes are directly implemented in the designed high-fidelity visual prototype.

Coding the algorithm

The algorithm on paper was converted into a rule-based expert system in Python. Jupyter Notebook was used to do the coding. The system used the Google Spreadsheets from iteration 1 as input data. The idea was to “read” the data frame the same way as the structure of the spreadsheet. Therefore, a timeframe was added in the column before. Besides the respondent data from the Spreadsheet, extra variables were created based on the same questions-input given in the wireframes. The algorithm should think like the therapists as much as possible. An elaboration of how the algorithm works is written in the Jupyter Notebook file. To test the algorithm’s outcome, the output of the algorithm was handly implemented in the high fidelity prototype. This gave the users a more personal experience to test the final product.

High fidelity design

Finally, the wireframes were converted into high fidelity screens to create a better visual understanding of the day planner since the colors are an essential feature to distinguish the different time blocks. Also, the colored screens gave the user better insight into the product’s look and feel.
The set of colors stayed the same as the proof-of-concept prototype in Google Spreadsheets to give a consistent feel to the user, and there were no comments made that gave reason to change it. However, trying out the different colors or letting the user personalize it could be options to try out soon. 3D illustrations were used to express an innovative and more fun appearance. Adjustments were made based on the feedback from the wireframes, such as the extra onboarding screen, the button to toggle between the different day planner screens, and a change of the checkmarks to controls in the day planner choices screen. Unfortunately, not all screens were entirely visually designed because of time and data. However, it was enough to create a better visual experience.

Usability test

The prototype was tested together with the personalized schedules of the respondents. However, one of the respondents was on holiday and could not participate in the testing round. This only left 2 ADHD students for the test. The respondents were given their personalized planner that came out of the algorithm and was designed into the prototype.

Parts of the algorithm

Morning

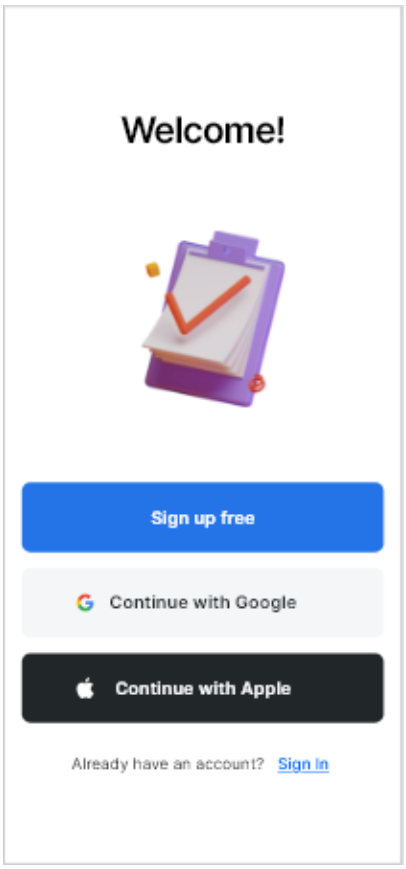
```
# get the correct time block cells
index_morning = df.index[(df['time'] >= actual_mroutine_time) & (df['time'] < lunch_time)].tolist()

# calculate how much halfhours / rows are between morning routine and lunch
time_in_morning = len(index_morning)

# if statements
if time_in_morning <= 4:
    df['N_actual_new'].iloc[index_morning] = 'study'

elif time_in_morning == 5:
    df['N_actual_new'].iloc[index_morning] = 'study'
    index_morning_break = index_morning[2]
    df['N_actual_new'].iloc[index_morning_break] = 'me'

elif time_in_morning == 6:
    df['N_actual_new'].iloc[index_morning] = 'study'
    index_morning_break = index_morning[2]
    df['N_actual_new'].iloc[index_morning_break] = 'me'

elif time_in_morning == 7 or time_in_morning == 8:
    df['N_actual_new'].iloc[index_morning] = 'study'
    index_morning_break = index_morning[2:4]
    df['N_actual_new'].iloc[index_morning_break] = 'me'

else:
    df['N_actual_new'].iloc[index_morning] = 'study'
    df['N_actual_new'].iloc[index_morning[8:]] = 'me'
```

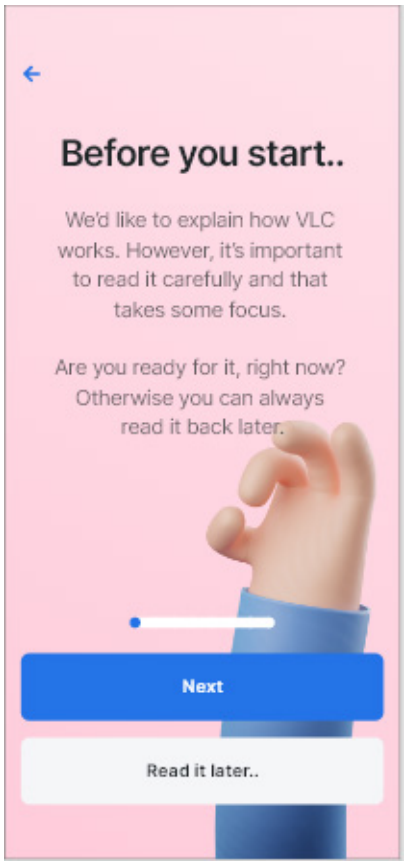
Afternoon

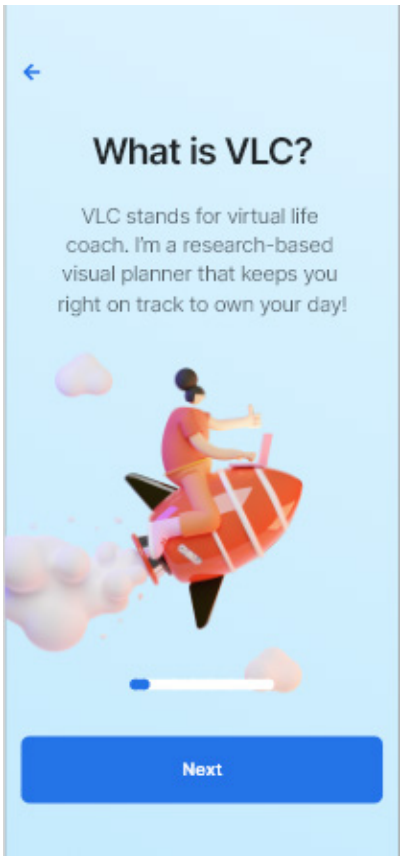
```
# get the correct time block cells
actual_lunch_time = lunch_time + lunch_time_hours
index_afternoon = df.index[(df['time'] >= actual_lunch_time) & (df['time'] < dinner_time)].tolist()

# # calculate how much halfhours / rows are between lunch and dinner
time_in_afternoon = len(index_afternoon)

def remaining_hours(index):
    hours_left = df["N_actual_new"][index].isnull()
    hl = hours_left.cumsum()
    hl = hl.sub(hl.mask(hours_left).ffill().fillna(0)).astype(int)
    hours_left = hl.max()
    return hours_left

hours_to_go = remaining_hours(index_afternoon)

while hours_to_go != 0:

    studying_sofar = df["N_actual_new"] == 'study'
    studying_sofar = studying_sofar.cumsum().max()
    study_period = desired_studytime - studying_sofar

    remaining_index_afternoon = len(index_afternoon) - remaining_hours(index_afternoon)
    remaining_index_afternoon = index_afternoon[remaining_index_afternoon:]

    if studying_sofar != desired_studytime:

        if hours_to_go <= study_period:
            df['N_actual_new'].iloc[remaining_index_afternoon] = 'study'
            break
        else:
            df['N_actual_new'].iloc[remaining_index_afternoon[:studying_max]] = 'study'
            df['N_actual_new'].iloc[remaining_index_afternoon[studying_max:studying_max+2]] = 'me'
            hours_to_go = remaining_hours(index_afternoon)
    else:
        df['N_actual_new'].iloc[index_afternoon] = 'me'
```

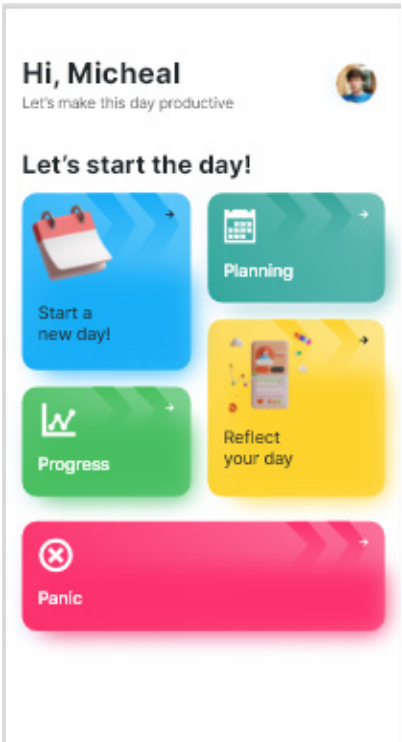
Evening

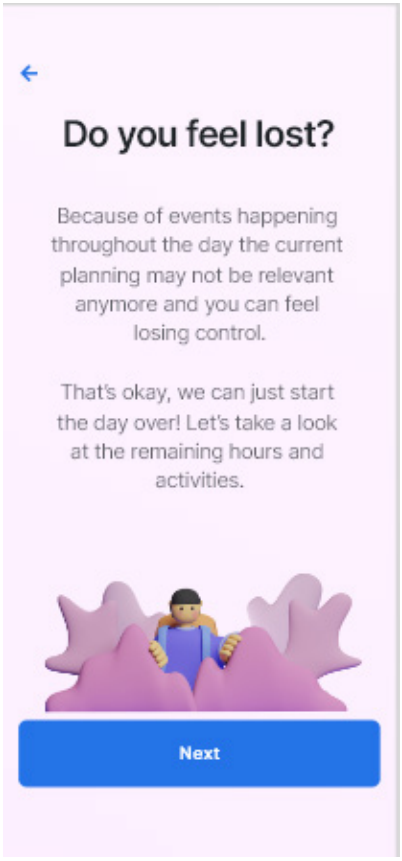
```
# get the correct time block cells
actual_dinner_time = dinner_time + dinner_time_hours
index_evening = df.index[(df['time'] >= actual_dinner_time) & (df['time'] < actual_eroutine_time)].tolist()

# if statements
old_social = df_hours_spend[df_hours_spend["categories"] == "social"].hours.item()
old_me = df_hours_spend[df_hours_spend["categories"] == "me"].hours.item()

if old_social <= old_me:
    df['N_actual_new'].iloc[index_evening] = 'social'
else:
    df['N_actual_new'].iloc[index_evening] = 'me'
```



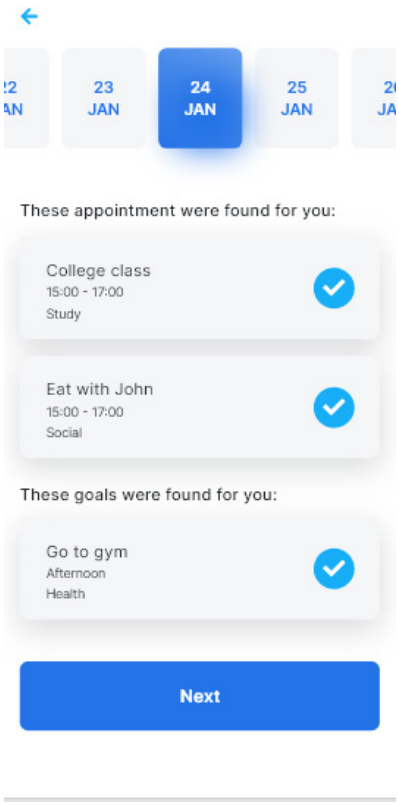


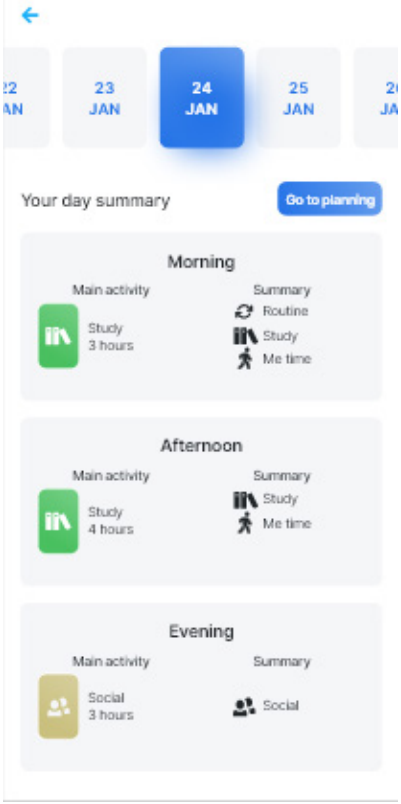


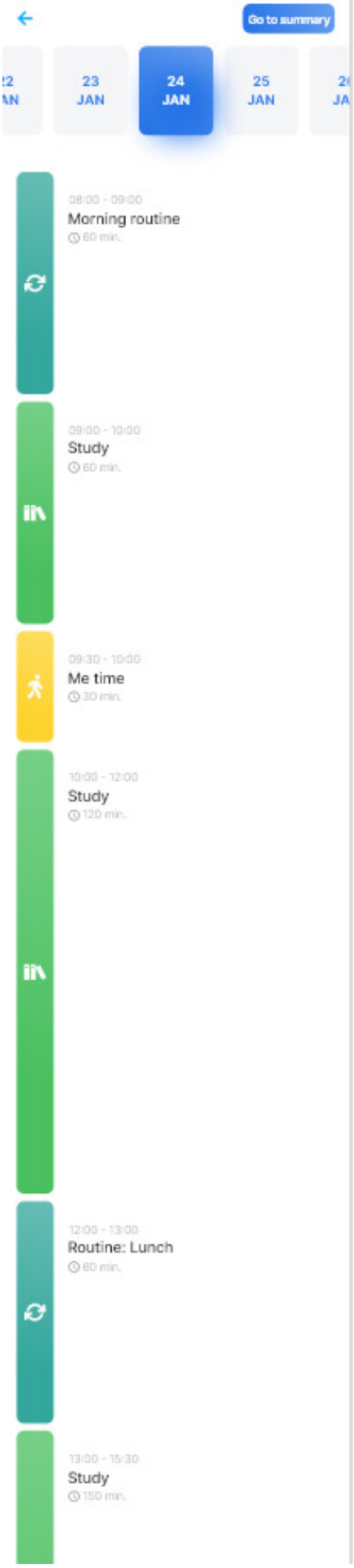


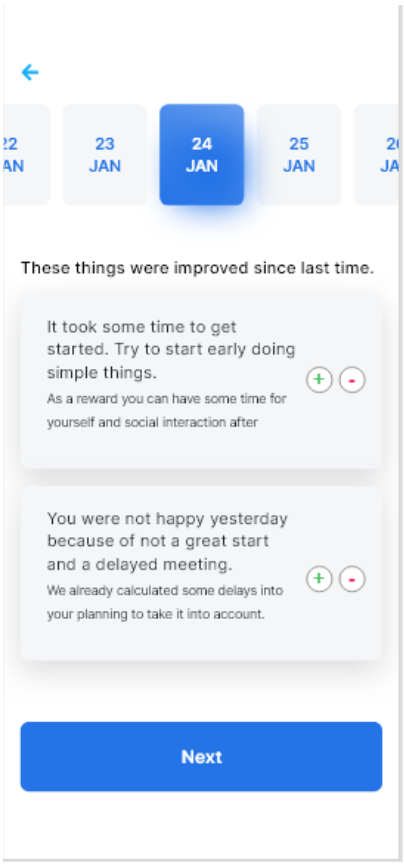


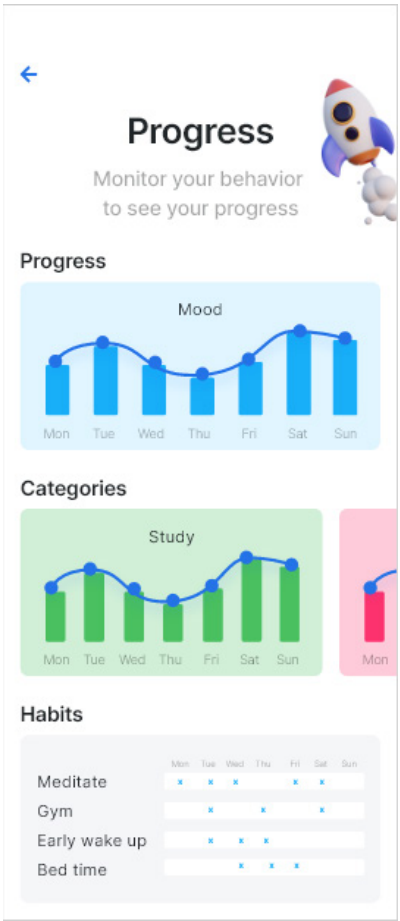
Impression of the high figelity prototype screens


23 JAN
24 JAN
25 JAN
These appointment were found for you:
College class
15:00 - 17:00
Study
Eat with John
15:00 - 17:00
Social
These goals were found for you:
Go to gym
Afternoon
Health
Next


23 JAN
24 JAN
25 JAN
Your day summary
Go to planning
Morning
Main activity
Study
3 hours
Summary
Routine
Study
Me time
Afternoon
Main activity
Study
4 hours
Summary
Study
Me time
Evening
Main activity
Social
3 hours
Summary
Social


Go to summary
23 JAN
24 JAN
25 JAN
08:00 - 09:00
Morning routine
60 min.
09:00 - 10:00
Study
60 min.
09:30 - 10:00
Me time
30 min.
10:00 - 12:00
Study
120 min.
12:00 - 13:00
Routine: Lunch
60 min.
13:00 - 15:30
Study
150 min.


23 JAN
24 JAN
25 JAN
These things were improved since last time.
It took some time to get started. Try to start early doing simple things.
As a reward you can have some time for yourself and social interaction after
You were not happy yesterday because of not a great start and a delayed meeting.
We already calculated some delays into your planning to take it into account.
Next


Progress
Monitor your behavior to see your progress
Progress
Mood
Mon Tue Wed Thu Fri Sat Sun
Categories
Study
Mon Tue Wed Thu Fri Sat Sun
Habits
Meditate
Gym
Early wake up
Bed time

Insights and Results

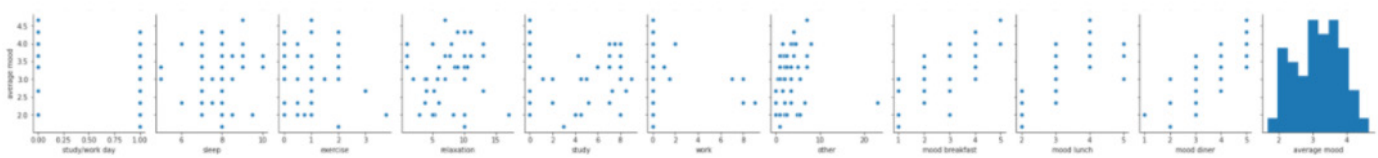
Unfortunately, there was not enough time to really get good results. There were also some limitations during this iteration. Because the schedule in the prototype was not adaptive during the day like the first iteration, the plan of one student was already non-valid after oversleeping. This did result in an insight into the importance of the adaptivity of the application.
A valuable insight was done about the structure and menu of the application. During the day, the respondent found that he would like a quicker entrance towards the planning. For example, this could be done with a swipe to the next page, a menu on the bottom screen, or by putting the day planner on the front screen while using the app.

Exploring Machine Learning

The rule-based expert system is a great framework for the algorithm of the system. However, the system should learn from the interaction of the user. This could be executed with a technique called Machine Learning. Machine Learning needs a lot of data. I wanted to explore wich Machine Learning algorithms could work best for the VLC. Therefore, I collected data from students in general. A total of 7 students gave data of their activities of a whole week. Besides reviewing mood once a day, I asked to do it three times a day. This way the algorithm had more data points to work with.
I analyzed the whole dataset and created a correlation matrix. I wanted to find correlation between different activities and mood levels. However, the data was still too small to get results from. I tried different algorithms to clusterize users (like k-means), because if the algorithm could cluster users, it could learn quicker from the same behaviour. However, there were no noticable results found yet.

		Did you plan to study or work today? 1 = yes 0 = no	*total hours of time in bed*	*total hours of walks, work out, meditation, running*	*total hours of chill, having a break, watch tv, read, relaxing, having fun, doing nothing, but also doing groceries, cooking*	*hours of studying, meetings etc.*	*hours of working*	*Just time you spend on other things*	*number of breaks you've had between your first study/work session and last, e.g. lunch counts as one*	*Give yourself a number how you feel. Think about your mood, energy levels, productivity,*		
user id	**day**	**study/work day**	**h/o sleep**	**h/o exercise**	**h/o relaxation**	**h/o study**	**h/o work**	**h/o other**	**n/o breaks**	**mood breakfast**	**mood lunch**	**mood diner**
101	monday	1	8:00:00	0:30:00	3:50:00	5:10:00	0:00:00	6:30:00	3	2	3	2
101	tuesday	1	7:00:00	3:00:00	5:15:00	7:15:00	0:00:00	1:30:00	4	2	3	3
101	wednesday	1	8:30:00	0:45:00	5:20:00	4:30:00	0:00:00	4:55:00	2	1	2	3
101	thursday	1	8:30:00	2:00:00	5:50:00	4:30:00	1:30:00	1:40:00	3	2	3	4
101	friday	1	8:30:00	1:00:00	7:45:00	4:15:00	0:00:00	2:30:00	2	3	4	4
101	saturday	0	9:00:00	0:30:00	13:00:00	0:00:00	0:00:00	1:30:00	0	3	3	5
101	sunday	0	10:00:00	2:00:00	8:30:00	0:00:00	0:00:00	3:30:00	0	2	4	4

Extra dataset



Corrolation matrix

FINAL THOUGHTS

The first insights were gained of using a virtual life coach for ADHD students. A prototype was made to explore its operation. I focused mainly on scheduling the users day with time blocks. However, there are still a lot of loose ends from the whole concept.

Things I'd docus on when I had more time

- Trying to create a large data set of dummy data to really explore what kind of Machine Learning algorithms are interesting for the project
- I think the ultradian rhythm is a really interesting concept. The VLC needs to learn the best way of a user's personal rhythm. Therefore way more datapoints of energy levels and mood levels must be collected during the day (for example every hour). I think it would be really interesting to find out more about these possibilities. However, in the eventual app it would still be the case that the user reflects only once a day.
- The user can choose different types of goals to focus on in the app. It must be explored what differences those goals would have in scheduling time blocks.
- Testing how time blocks could be more visually attractive by trying different shapes and colors.
- Exploring ways of interactivity between the system and users. You want to let the user do as little work as possible. How would they indicate when they were disctracted or how could the system make it easy for the user to change time blocks (also during the day)
- Another interactivity aspect would be the notifications. What messages work best to motivate the user to encourage using their schedule?
- ADHD students have trouble with the concept of time. Therefore they are usually late. An intersting feature to explore would be commuting time and notifying the user well in advance that they need to get ready to leave and must not forget anything.

Thank you for reading.