

# **6CCS3HCI Human-Computer Interaction**

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Group Coursework: Human-Fitness Interaction

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# 1 Introduction

Students are one of the most integral groups of the social structure and it is vital that due attention is given to ensuring this group has adequate support to flourish not only as scholars but also as individuals. Being the forerunners of the future, it is in everyone's best interest to ensure our student's needs are satisfied. This is important as tomorrow demands well-rounded, wholesome individuals who can cope with pressure well and possess excellent interpersonal skills. On top of that, students need support to ensure their education is not at the cost of physical and mental health.

However, students are quite often than not exposed to a high-pressure environment. There are various stress factors that impede the growth of students preventing them from reaching their full potential. One of the most common issues plaguing student life is the lack of time to carry out activities outside the constraints of the classroom. Students find a hard time balancing study and life.

This project aims to bridge the gap between work and leisure. We envision an application that can help students manage their time well so that they can focus on themselves and their studies. This application helps students prioritise and plan their studies while being able to engage in activities that interest them while introducing them to new activities that can help them widen their horizons.

Physical health is of utmost importance; however, we must also pay attention to mental health as one cannot exist without another. In this project, we pay close attention to figuring out the best way to help students in finding the right balance of work and play, with emphasis on both body and mind. In other words, we define 'fitness' as not only physical fitness but also psychological fitness such as mindfulness, self-appreciation and self-motivation.

## 1.1 Miro Board

An online whiteboard tool called Miro was utilised in the Empathise and Define stage. The whiteboard includes codebooks, quotes, codings, themes, personas and problem statements. We made use of colours and shapes to better convey and cluster information.

Link: [https://miro.com/app/board/o9J\\_1mNPUvs=/?invite\\_link\\_id=815886788158](https://miro.com/app/board/o9J_1mNPUvs=/?invite_link_id=815886788158)

## 2 Empathise and Define

### 2.1 Existing technologies

Before commencing the project, we walked through existing technologies that are at the disposal of students. Several web and mobile applications exist to aid students to manage their time better and managing their fitness alongside their studies.

**Notion:** This application is widely used by students to manage their time and plan out the tasks that they must complete in order of priority. While this is a powerful tool to plan activities, it does not actively help students manage their time by providing suggestions or motivation.

**Health Apps:** Mobile applications like Samsung Health and Apple Health do indeed provide a good means for users to engage in physical activities while promoting mindfulness. However, they are meant purely for fitness and aimed at a wider audience, not geared towards students. This means, there are no timetabling or scheduling functionalities.

**Headspace:** This application, with over 10M+ downloads on the Play Store, does a wonderful job promoting exemplary mental health habits. From stress management to sleep techniques, this app is a perfect tool to promote psychological wellbeing. What this app does not do is help with scheduling. It also does not delve much into physical health.

The applications above are just a handful and there is a non-exhaustive list of like apps. Carrying out research on existing devices and software helped provide inspiration and allowed us to find out what we can do better.

### 2.2 Interviews

#### 2.2.1 Interview Guide

In producing our interview guide, we took inspiration from the ‘Anatomy of an Interview’ in the Empathy Fieldguide from the Institute of Design at Stanford. We curated the interview guide to ease into the main topic by first building rapport with the interviewee. After solid communication is established, we delve into questions aimed to evoke stories, feelings and emotions.

During the process of building the interview guide, we role-played among ourselves to help build meaningful questions and ensure we do not introduce biases. We also paid close attention to allowing the interviewee to be able to fully and freely express themselves and take extra careful steps in not priming them.

We carried out a few pilot interviews with family and friends to gauge the effectiveness of the interview guide. This also helped us iron out questions that were ambiguous and phrase questions more concisely. For instance, we found out that too many questions to build rapport are counterproductive as the interviewees do not see the relevance of such questions. Also, the pilot interviews brought to our attention that we should take extra caution in avoiding asking the interviewee questions that were too similar such that they warranted the same answer. Asking questions that have already been answered causes the interviewee to think that we were not paying attention to what they have to say. Hence, we went through multiple stages of drafting and iteration alongside the pilot interviews and role-playing to curate, what we believe, is a well-formed interview guide.

On a more formal note, we started off the interview by asking for the explicit verbal consent of the interviewees to be interviewed and to have the audio and video recorded. Although this part of the interview does not provide any insight into the topic at hand, it is the most important part of the interview since the

analysis of the interview heavily relies on recording and transcription.

The interview guide is divided into two parts (consent taking and information procurement). Each part is broken further down into sections per the Empathy Fieldguide. Below is the final interview guide that provides a close look at the questions and the structure of the interview.

Table 1: Interview Part A - Consent Taking

Category	Question	Remark
Intro to Yourself	Thank you for taking the time to meet me today.	Set a positive environment for the entire interview.
	I am <name>, a 3rd Year Computer Science student from King's College London.	Important to introduce yourself and state professional capacity.
Intro to Project	This interview is to help us gain insight into our goal to create an app to help students balance fitness and studies. It is a task for our HCI module coursework.	Inform the interviewee of the purpose of the interview.
Consent	Is it fine if I record the interview?	Explicitly seek consent to record.

Table 2: Interview Part B - Actual Interview

Category	Question	Remark
Build Rapport	What is your name?	To ensure the interviewee fits the group of interest.
	How old are you?	
	What made you apply to university?	
	How did you feel when you found out you are going to be a student?	
	How was the first week of the term when you started to make connections and to learn new things?	
Evoke Stories	Could you please tell me more about how much free time you had?	Get a basic idea of their priorities.
	Can you think of ways you spent your free time unwinding?	
	How did all your free time activities change when you finished the first year?	
	Tell me about a time when maintaining a good fitness level improved your academic performance.	
	If NO: Tell me about a time when you thought about relaxing your mind while studying.	
	If YES: How do you find using modern technologies to manage fitness?	
	What was the last physical activity you carried out and when was it?	
Explore Emotions	Walk me through how you scheduled that activity to fit into your student timetable.	Kickstarts the more intimate emotional discourse.
	Can you tell me more about a day when you had no time for anything else but study?	Gain insight into personal life.
	How did you feel then?	Explore their emotions.
	How do you engage with your studies when you are stressed?	Ask for potential ways of dealing with such emotions.
	What techniques do you use to recover fast when you have fallen behind the material?	Explore how they recover from setbacks.
Follow-up and Question Statements	Do you actively seek work-life balance?	Figure out if the app would be beneficial to them.
	What improvements could you make to your schedule to maintain a better fitness level?	Know how they manage their time.
	What was your biggest struggle during your last few gym sessions?	Make them recount the last experience.
	In addition to the gym sessions or any other physical activities, is there any other approach to maintain your fitness? <i>(Maybe let them think about an example?)</i>	Seek their additional/alternative ways of maintaining physical health.
	To what extent do those physical exercises help with your study?	Figure out how well maintaining fitness helps with their study.
	Why do you think keeping your fitness at a high level should be beneficial while studying?	If maintaining fitness really helps with their study, ask for a reason.
Thanks and Wrap-Up	Thank you for your valuable response. I learnt a lot and it will really help our project.	Leave a good impression.

### **2.2.2 Interview technical details**

A total of 21 interviews were carried out. Each interview lasted about 15-25 minutes. The interviews were conducted via a Microsoft Teams Video Call as this enabled recording of the interviews and aided in the transcription process.

### **2.2.3 Interview Analysis**

The interviews produced some very insightful data. The interviewees brought many important points to attention. In the process of selecting quotes, we focused on phrases that provided an insider's look at the ins and outs of the interviewees' lives. Ranging from daily activities to personal feelings, the interviewees shared their personal stories and this greatly helped in understanding the user base of this project. These quotes were then clustered into codes that encapsulate the general idea and consensus among statements made by the interviewees.

### **2.2.4 Quote Selection**

Below are a few examples of quotes we have selected from the interview and the motivations behind why they were chosen.

*"I ideally strive to get all the work out of my way. And then just enjoy the rest of my life."* (Edwin's Interviews)

*"Overcome stress by just getting the job done."* (Edwin's Interviews)

*"I had a deadline today and I couldn't go on long walks for a few days because I was too stressed with finishing my assignment."* (Iris' Interviews)

*"Before exams, I have to catch up on everything I haven't done during the year and I feel extremely stressed."* (Louis' Interviews)

These statements highlight that students see their work as an obstacle between them and enjoy. Their solution to enjoy their life is then to go all-in on completing their tasks and get it off their minds. We chose these as quotes because they give insight into how students view their student responsibilities and studies.

*"My leisure time I either play a game or watch a movie on Netflix or watch TV shows."* (Edwin's Interviews)

*"I think it's really useful to come to see a therapist from time to time. I'm pretty planning to do it soon."* (Iris' Interviews)

We selected these statements above as helpful quotes because they provide an idea of how diverse the hobbies and interests of students are. In addition, it brought to attention that while students appreciate social activities in their leisure time, there is also an innate need to unwind without being in the companionship of others. Therefore, it is noticeable that they do not only focus on achieving a 'healthy body', but also a 'healthy mind'. This means that our project must focus on activities that can both be carried out with friends and those that only require the student themselves.

*"It's like I if I just manage my stuff properly, I'm pretty sure like I have like a lot of time to spare."* (Edwin's Interviews)

*"The first week of the first year was pretty confusing. I didn't know what the professors wanted from me. I didn't know what I was supposed to do or learn or study."* (Andrei(Bobo)'s Interviews)

*"I think a big difference for me compared to high school was the amount of independence we were given. School had a very fixed schedule."* (Andrei(Bobo)'s Interviews)

The statements above highlight the difficulties students face when transitioning from high school to university studies, especially in a different country. It could be an intriguing experience, but it also forces students to get out of their routine and pushes them to different experiences. A student learns to cope with these problems over time, so there is evidence here that we could provide a solution for students to adapt with ease given their background.

*“In my free time, I usually go outside for walks because I think it’s really important to have some physical exercise.”* (Iris’ Interviews)

*“Sometimes I do like 5, 10, 15 minutes quick exercises just to unwind from the study and then get back to it. I can’t skip it because it really boosts my productivity, it makes me work more.”* (Zihao(Anderson)’s Interviews)

From the selected quotes, we can notice that all students try to have a healthy lifestyle, proving that even the small things count. Most of the interviewees affirmed that their relationship with fitness is not great now, but they are trying to incorporate it into their everyday life in order to unwind. One task we would have to accomplish in our project is to make it easier for them to balance their workload and fitness – some suggestions of some easy ways of doing fitness would be very beneficial for them because it saves them the time of thinking about the potential activities and the scheduling. The problem is that while students tend to go to the gym to relax a bit, they still think about the work they have not managed to complete so they are not fully engaged in exercising.

*“I don’t have as much free time as I used to have in the first year.”* (Andrei(Bobo)’s Interviews)

*“I was really used to online stuff and going to campus is fun, but it’s really annoying, I was hoping we can go back online. Although yeah it was really great meeting all my coursemates in real life, physically going to the tutorials and like all that but it took much more time from my day than the online lectures, which was a big change for me.”* (Zihao(Anderson)’s Interviews)

The statements above highlight that students tend to refer to their past experiences when scheduling their daily activities and they are in a continuous learning state. Some of them use their knowledge in making studying more efficient, others would like to continue discovering while studying.

## 2.2.5 Codings

Codes were generated upon deep inspection and analysis of the quotes. Similar ideas and concepts were agglomerated into concise words or phrases. The table below outlines the codes and explains the differences alongside some excerpts from the interviews corresponding to the code.

See a screenshot below of one of the codebooks:

Edwin			
Code	Meaning	Example	Note
Struggle	Struggles faced by interviewee. This is generally attested by negative remarks made by interviewee. The interviewee finds it hard to schedule.	Much less time as like compared to last year for like leisure and like things that I want to do.	The difference between struggle and problems is that, struggle refers to scheduling related hardships while problems refers to personal issues or limitations.
Problems	The limitations faced by interviewee such as not having access to technology or certain medical conditions.	Last year I just got into working out. But like I don't engage my lower body so like nothing below the hips.	
Positive Feeling	The interviewee expresses positive emotions such as joy and satisfaction.	It was still fun, so like I managed to meet people.	
Opinion	Opinions and ideas from the interviewee.	Like as a person don't really get stressed that much.	
Routine	The daily activities carried out by interviewee day-in day-out.	So, uh, usually like the mornings are pretty busy, but in evenings, usually some free time.	Routine is more geared towards the daily activities carried out while activity refers to extra-curricular involvements and hobbies.
Activity	Activities carried by interviewee to de-stress or simply for fun.	Chat with my flatmates in the kitchen 'cause there are so many of us.	
Good Balance	Activities carried by interviewee to de-stress or simply for fun.	I know it's busy, but like there's still time to myself if that makes sense.	
Scheduling Technique	The method used by interviewee to organise their activities.	I use notion for work.	
Solution	The interviewee suggests a solution to a problem that either they have faced, or faced by someone else.	I can also ask like friends for help to catch up.	

Figure 1:

## 2.2.6 Generating Codes

To generate codes, each team member firstly generated their own versions of the codebook, based on their interview quote features. For instance, the code “Obstacle” includes students that have difficulties adapting the in-personal teaching after the pandemic since the time for freshening/dressing up and commuting must be taken into consideration. The code “Routine” covers the interviewee’s own pattern of keeping some form of fitness under an intense workload. Moreover, the code “Activity” involves the interviewee’s actively seeking out alternative approaches to making them happy, in addition to carrying out daily exercises for maintaining a good physique.

According to the codes generated by each team member, some initial design ideas have come up. The major one so far is the requirement of having some tasks that take a tiny amount of time for the users to accomplish but that will make a significant impact on their fitness level. The other one refers more to flexibility in usage, as including a wide variety of selections that can maintain a user’s physical and/or mental health. User’s needs are distinct person to person, and someone may place a better emphasis on mental health while others may not.

As code refers to a specific feature of a particular dataset, a document for the detailed description of each code can be found here:

<https://docs.google.com/document/d/1oJbUHxFPgzb-mh7QS9gTbu7uzB8KmfITkFAWx0a37Sk/edit>.

This state is essential in order for the team to be able to successfully dive deeper into the analysis and identify broader patterns of each code.

## 2.2.7 Identifying and defining themes

For the themes to be able to successfully come up, a meeting was held for the purpose of generalising and combining all our own quotes into a few categories. To be specific, the whole team dragged all codes from each individual, then group all of them into 5 categories by removing codes that are repetitive, too similar or too vague. The different final themes and their corresponding codes are the following:

- Time-Management:

This theme contains five codes detailed **Scheduling Technique**, **Good Balance**, **Study habits**, **Fitness habits** and **Routine**. During the selection of the code, “Balance” and “Scheduling” has got filtered out and instead been used as “Good Balance” and “Scheduling Technique”, for the sake of emphasising its quality. A decision was then made to merge the scenario of interviewees’ balancing their study and life as well as their own pattern of maintaining their fitness, which in turn came up with the phrase “Time-Management” for the case when interviewees have complained that their workload is excessive. One of them prefers taking short breaks during his study via “do like 5, 10, 15 minutes quick exercises just to unwind from the study and then get back to it”. Another focuses on more like a long-term plan via “normally I do the studying around my sport and when it’s exam period then I’ll really revise super hard all the times for not doing my sport.”

- Challenges:

This theme contains three synonyms **Struggle**, **Problems** and **Obstacle** but with a slightly different meaning depending on the codes contexts. Another similar word “Challenges” had been found also describing a new or difficult task for someone, which pretty much covers the definitions of all three codes mentioned above. For scheduling related hardships (Struggle), an interviewee said that it’s kind of hard for him to add more exercise into it because of the part-time job and the course being more difficult and also more things on campus. On the other hand, there’s another interviewee who mentioned that it’s pretty hard to meet anyone new after taking two years’ gaps for personal issues (Problems) since anyone I would have known has already graduated or graduated a year ago.

- Activities:

This theme involves the codes **Diverse Activities** and **Recharge**, which mainly explores interviewees’

various extracurricular involvements and hobbies. That is the reason why the code “Activities” hadn’t been selected but instead “Diverse Activities” so as to highlight the activities that interviewees have carried out is different from each other. In addition to maintaining good physical health, mental health is being emphasised as well so that students can do whatever makes them happy if they feel stressed. In our code examples, someone mentions gym sessions for the physical health side of focus while others say meditating or coming to see a therapist as far as the mental health concern.

- View:

This is the theme that stores interviewees’ opinions, feelings and emotions on mainly two sides, study and fitness containing the codes **Opinion**, **Positive Feeling**, **Active Emotion**, **Passive Emotion** as well as **Self-awareness**. Although the two codes “Positive Feeling” and “Active Emotion” is similar at a first glance, however, an interpretation was made and agreed with all members of the team recognising that “Positive Feeling” is indeed a subset of “Active Emotion”, according to the Code Definitions document mentioned on the previous section. On the other hand, the code “Emotion” was disregarded and instead specified as two categories entitled “Active Emotion” and “Passive Emotion” in order not to fall into the trap of the code description itself being too general. For the study side, one of them makes a comparison of online and remote learning by saying “it’s much more engaging to be on campus in person and much more motivating to do work, rather than online because online is kind of on my own schedule a lot of the time and it’s easy to be lazy and not do anything”. For the fitness side, one of them specifies a very basic form of daily exercise which is walking, “I live like 30-35 minutes walk away from campus, so I usually walk one way to campus and then take the bus or train back, that means like in general, I track everything in my Apple Watch and every day I have more than 10,000 steps.”

- Adaptation and Solutions:

In this theme, interviewees talk about their experience of switching their old, traditional routines into a new one in order to get used to the changing situation, along with four codes **Learning from experiences**, **Past-present comparison**, **Transitioning** and **Solution**. Here, the comparison made by interviewees was all based on previous experiences or situations and that’s why we have chosen not to include the code “Comparison” but instead constrain it with a specific timeframe, which is where “Past-present comparison” has come into place. We have then decided to consider two concepts “Adaptation” and “Solutions” as a whole because essentially students have to make their changes for the sake of fitting themselves into a new situation. A typical example mentioned by one of the interviewees is the change of ways to maintain his fitness under the accumulated stress environment, “I changed a bit of my routine towards more like bodyweight training or recovery training, for relaxing my mind, rather than lose fat or gain muscles, for looking better.”

As each theme possesses a central organising concept with lots of different ideas or aspects, it’s especially important for us to complete this to the highest standard possible so that it will begin to shine at the later stages of our project. More details on the theme can be found on the Miro board.

## Codings

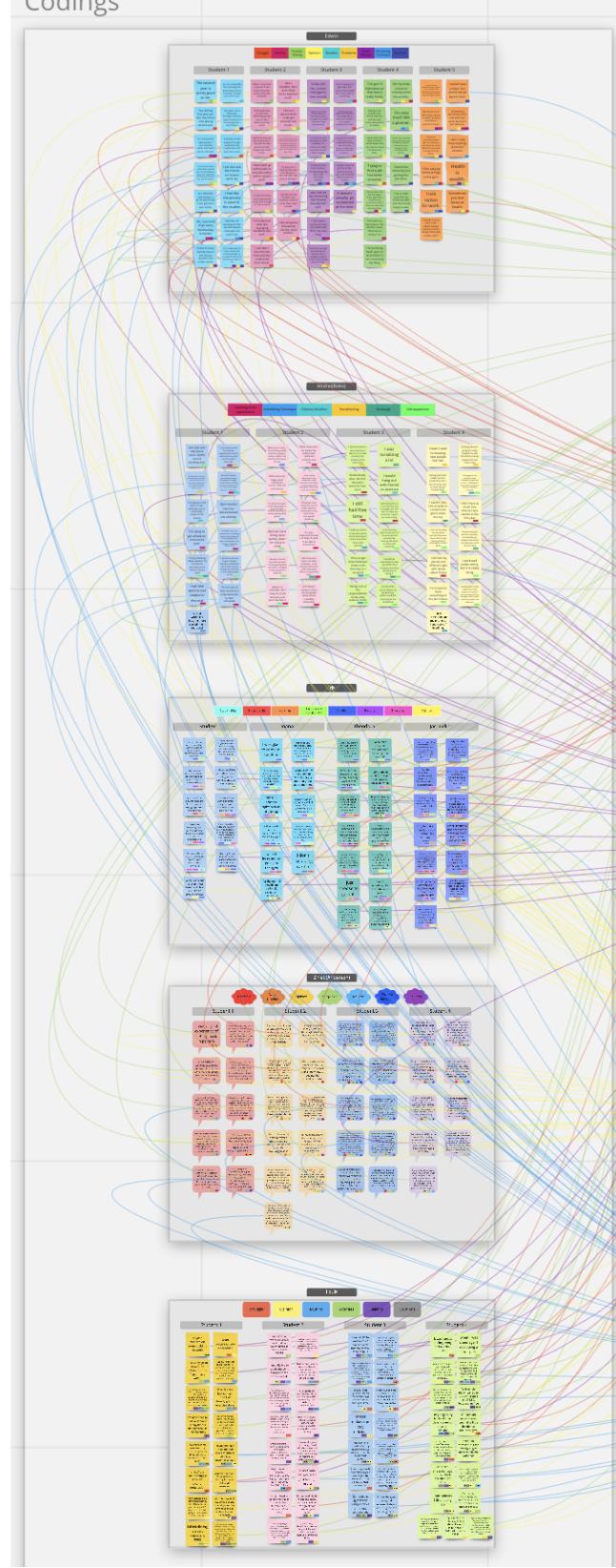


Figure 2:

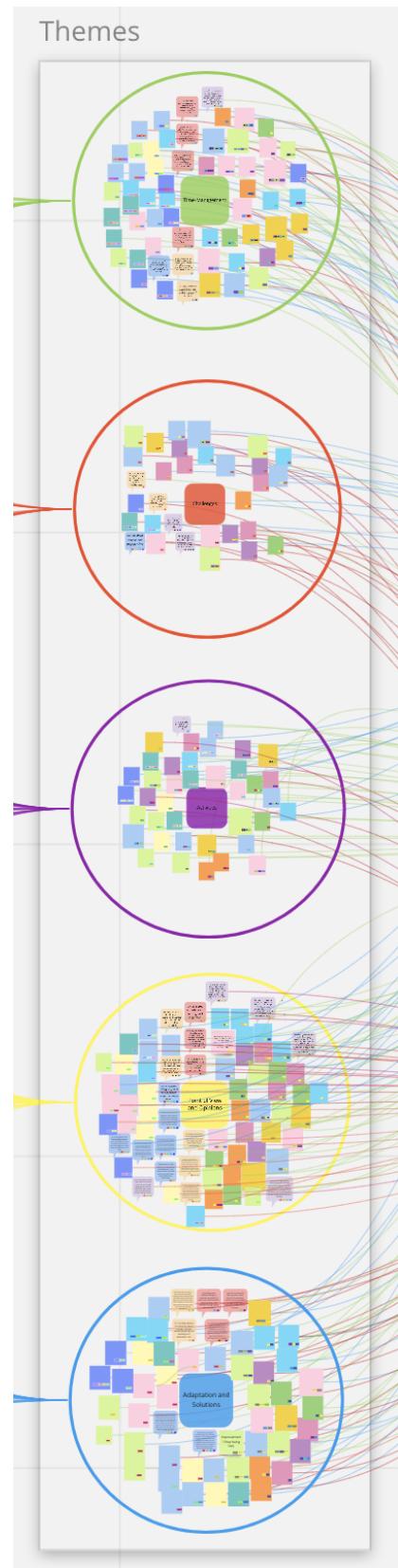


Figure 3:

## 2.2.8 Empathy Maps

After selecting meaningful quotes from our interviewees, we analysed their point of view, feelings and way of reacting in different situations. Therefore, as a result, we produced one empathy map for each member of the team, containing quotes and codes for their interviewees. Having multiple empathy maps made us realise some facts about our chosen students: the common day-to-day problems, the emotions they feel and how they choose to react to them – either just a passing thought or a tangible action. In addition to that, taking into account their different personalities and the diversity of nationalities, we observed that a global problem in their student life is time management. Even if they accomplished a balance in their schedule – or not -, they still face a lot of problems, as they seem to wish for a more relaxed environment, where leisure activities and fitness have a reserved time slot.

Below is an example of one of the empathy maps, which contains four categories: FEEL, SAY, THINK and DO. These showcase the type of affirmation in which each quote fits in:



Figure 4:

## 2.2.9 Personas

The student population we interviewed, albeit diverse, had many clustered similarities. Thus, we were able to group them into clusters of similar characteristics and personalities. Below, we have listed the groups that we have observed to exist among our interviewees, the justifications behind each in regards to the quotes and the persona that was generated for each grouping.

### • Group 1

#### Attributes:

The student who finds it a challenge to cope with a dynamically and continuously changing environment. These students are also generally inclined to work towards enhancing academic performance.

#### Quotes:

*"Usually I hate myself for the fact that I could have worked better throughout the year."*

*"I used to maintain a healthy diet by doing meal prep with my girlfriend at home half of the week, but that's become harder since being in London because I am out of the house so much more."*

*"There were few times that I've felt under pressure, mostly when very close to the coursework deadlines."*

Persona:

The observations above gave birth to **Adam**, a student with a clear end goal but struggling with time management as a result of the dynamic nature of being a student. As a result, he is very much averse to changes to him and around him.

• **Group 2**

Attributes:

The student is well-rounded and quite apt at personal scheduling and balancing work and play. Nonetheless, they would very much appreciate a bit more structure that would, as a result, help them engage even more in physical activities. However, in spite of being in control on the surface, they have the issue of not being able to fully focus on leisurely activities when engaging in them as their thoughts still linger on their academic responsibilities.

Quotes:

*"Maintaining fitness is a productive way to engage your free time. It makes you feel better. It gives you more energy."*

*"I still had free time."*

*"I feel like my body is kind of missing some activity."*

*"I can't fully focus on having fun because I'm constantly worried about my studies."*

Persona:

The observations above birthed **Sylvia**. She is pragmatic and completes her tasks properly while still ensuring she spends time for herself. She has a good balance between fitness and studies while also engaging in social activities. Despite that, she finds it hard to fully enjoy the activities she engages in because her subconscious is constantly worrying about her studies and responsibilities.

• **Group 3**

Attributes:

The student who splurges at the moment and has problems prioritising their responsibilities above fun. They see life as a gift and try to gain as much worldly experience as possible. They 'go with the flow' but would still want to graduate and enter the workforce with somewhat good academic results. However, they feel stressed at times because they feel guilty about not prioritising their studies first.

Quotes:

*"When I'm stressed I can't really do much because I just don't feel like it."*

*"I was really excited because I always want to experiment with new things, being a student makes me feel free."*

*"Before exams, I have to catch up on everything I haven't done during the year and I feel extremely stressed."*

*"I just choose to go out."*

*"Just doing 5 minutes of that (not enjoyable work) can be incredibly exhausting."*

Persona:

The findings above produced **Morgan**, a free-spirit, so to say. They try to enjoy life to the fullest and just aim for the minimum required for them to graduate. They find it hard to motivate themselves to study as they feel like there's more to life than studies and responsibilities. They eat well but don't actively engage in physical activities. Their idea of leisure is social activities like spending time with people at parties rather than alone time.

For each persona, we started with collecting evidence in a persona draft and then moved to a more visual representation of it. A draft persona could be seen below:

Name: Adam

Age: 21

Pronouns: He/Him/His

Intro: Adam is a 2nd Year Civil Engineering Student at UCL who lives at a student accommodation.

Goals: Succeed in life and become an Engineering Project Manager. Short term goal: Secure a first in his degree.

Frustrations: He constantly struggles in managing time especially when it comes to studies. Wishes plans would be static and he is adverse to dynamically changing deadlines and timelines. He is frustrated that the results obtained (from a task) are not directly proportional to the effort put in.

Behaviours: Has very high standards to how tasks are to be done and endeavours to achieve that standard at the cost of physical and mental health. He finds it hard to engage in leisure activities due to the demands of the course he is taking. Finds it hard to manage his study time due to the dynamic nature of university life and thus feels stressed when completing his tasks. Wakes up early to work and enjoys Netflix in the evening. Main workout is walking to uni or around LDN and do some home workout sometimes.

Interests: Enjoys good food and likes to go restaurant hunting. Likes to read research papers, Netflix

Figure 5:

The relation between the data collected and the clusters is represented by arrows starting from a quote and pointing to a persona.

#### 2.2.10 Problem Statements

We worked on the problem statements creation as a team, generating different possible scenarios for each persona created and using the 4 Ws (who, where, when questions etc.). We decided upon creating a general problem statement for each persona and then generating the final problem statement from that. We will look forward to exploring different scheduling, balancing and engaging techniques. Our users should be able to rigorously plan their daily activities in order to maintain their fitness while ensuring a good academic performance. We also tried to hone in on specific matters of interest and try to cover as much ground as possible while still ensuring that we do not overarch in synthesising the problem statement. The challenge was to create a problem statement that is concise yet profound while being solvable given the constraints.

Returning to the quotes and the whole analysis is done so far, we started collecting additional assumptions and methods to test them later on so we can build up the prototype accordingly:

- We met students and discovered that some of them would rather prefer achieving good grades rather than doing fitness. We wonder if:
  - This means that they are not aware that fitness and leisure can improve their academic performance (a fact demonstrated also in the literature) - this can be tested via a prototype that supports demonstrations that this actually helps studious people.
  - This means they do not really have any free time or they prefer doing any other activities in their free time - a prototype that supports scheduling activities from before would help us discover how this type of students handle their free time.
- We met students and discovered that some of them would prefer doing any other activity rather than studying and that they get stressed when deadlines are approaching. We wonder if better organisational skills would help them lower the level of stress they feel - we can test that with a prototype that offers them a way to connect with similar/different people.

### 3 Ideate and Prototype

#### 3.1 Ideate

After diving deeper into the information that our previous work produced, we moved to the next step: now that we have the problems of our targeted part of the society, how can we improve what already exists? Here is where the ‘How Might We’ questions come into play - we needed to open up the pool of possibilities by generating creative ideas fitting for everybody and avoiding judgment. Therefore, we analysed all potential problems and after gathering enough of them, we started sketching suitable solutions. From our point of view, there is nothing more useful than quick and unexpected brainstorming, therefore laying our ideas on a piece of paper with a previous set time limit was the most productive option. We also tried using a requirements list technique to set the team in the same direction.

##### 3.1.1 “How Might We”s

In order to address the user needs and requirements - which can be found in the problem statement - we listed a number of keys ‘How Might We’ questions. These questions were created individually by each team member after which we merged similar ones and deliberated on interesting points. The HMWs were key in finding out what were the main issues faced by students. This process is crucial because figuring out solutions to problems first starts with identifying what the problems are.

In the process of generating the questions, we created smaller segments that aim to inspire the questions and to act as a motivating factor for the generated questions. Below is a non-exhaustive list of the questions that were decided upon deliberating all the ideas given by every team member.

The complete list of HMW questions can be found on the Miro board.

##### Amp up the good:

- HMW further perfect students’ time management skills?
- HMW make challenges enhance the level of fitness for students?
- HMW develop a good balance between studying and leisure?

##### Remove the bad:

- HMW reduce the stress caused by studies, coursework, deadlines and grades?
- HMW eliminate/put challenges aside of student’s fitness life?
- HMW deal with clashes when students have multiple things they want to do at the same time?

##### Explore the opposite:

- HMW make pressure and stress into something productive and into a driving force?
- HMW leverage students’ daily commute time and make them do something more useful instead of just sitting on the train/bus?

##### Question an assumption:

- HMW help students maintain good health and fitness level without exercising?
- HMW make students still focus on the very basic form of daily exercises like walking when they’re too preoccupied, keep them active?

##### Go after adjectives:

- HMW make time management calming instead of laborious?
- HMW make the academic environment adaptive instead of overwhelming?

**ID unexpected resources:**

- HMW get the help of the university in helping students maintain good health?
- HMW use students' time to improve their academic performance? (Other unexpected resources: academic competition, parents' pressure, the student is low on money)

**Create an analogy from need or context:**

- HMW make going to the gym fun? Like getting a massage/caffé?
- HMW make the university feel like a 2nd "home", a more comfortable environment?

**Play POV against the challenge:**

- HMW make studying and revising something students want (not have) to do?
- HMW come up with a kind of exercise that students are the most willing to do?

**Change a status quo:**

- HMW make students less distracted when involved in activities?
- HMW make those stressful, anxious students less overwhelming by not overemphasizing the objective of achieving good grades?

**Break POV into pieces:**

- HHMW get them into meditating so that they can learn to unwind once in a while?
- HMW keep track of objectives (short or long term)?

### 3.1.2 Generating Ideas from HMWs

The HMW questions provided a solid starting point to initiate the process of brainstorming ideas. Analysing them gave insight as to what problems we should address and how we should go about addressing them.

As a team, we brainstormed ideas to solve the problems posed by the questions above. At this stage, we invited complete creativity and freedom with a no-judgement mindset which allowed us to come up with solutions that were very much unorthodox and out of the box. We then honed in on tractable problems with feasible solutions.

This is also how we selected the directions to focus on. We considered the app should treat the problems students face when trying to balance their activities (*"I just have to stick my head in the sand and get the work done. I don't really have many options."* - a student constrained by studies) when lacking motivation (*"It was hard at the beginning to have the motivation."*) and feeling stressed (*"I feel like I'm drowning. I'm surrounded by work that never ends."*). We verified our problem statement, from the Design phase, against these assumptions and managed to stay on track with the proposed solutions.

One important matter we came to realise is that the proposed application should be something simple yet powerful, personal yet collaborative - any type of student should be able to find themselves in our representation of the problem-solution pair. This resulted in us focusing on developing a smartphone application. The justification behind this is that phones are prevalent in the hands of students making them accessible and convenient.

After analysing the HMW questions we produced after in-depth discussions, we decided to cluster all of the HMWs in 10 centres, which represent the key points we needed to reach and features we needed to implement. Below are some of the generalised HMWs that we magnified in the efforts of developing a feature list alongside some of the proposed solutions.

#### HMW improve students' balance techniques?

One of the key observations was that many students already have an existing time management system in their minds. However, poor execution leaves them running behind or feeling overwhelmed. Some of the ideas proposed to solve this include creating a planning application that would sync with the students' study timetable and creating some sort of an avenue where students would be able to share their own scheduling techniques for others to learn.

#### HMW reduce stress and enhance the students' need to progress?

Lack of motivation and procrastination is prevalent among students and students quite often lose the initial drive to work on something as time passes. One of the ideas to solve this included making the task that the students were engaged in more fun and interactive. This raised the matter of how we should go about making an otherwise mundane or boring task something students would look forward to. This sparked the idea of a reward system that would motivate students to complete the task at hand and 'punish' them for abandoning their responsibilities. An extension to this idea was to make the points publicly available on a leaderboard which could unsurfaced the competitive nature of students.

#### HMW motivate students to find balance not by explicitly telling them so, but by a means of a "game"?

Students tend to have lingering thoughts on their responsibilities and studies even when they are engaged in physical or social activities. More often than not, this is not a deliberate action by students but rather a subconscious one. Having some form of focus mode in the app that aimed at making students more mindful was one of the suggested ideas in efforts to overcome this. The primary aim was to make students aware of their thoughts and remind them to ease the burdens in their minds.

#### HMW produce a system to give them activities suggestions in an organised & diversified way?

This was a key question that ended up being one of the biggest driving factors behind the application that was developed in this project. Monotony was the biggest detractor based on our observation and research. Students want to feel enriched and they want to widen their skillset alongside their knowledge. A few interesting ideas came up, one of which was to incentivise students to participate in activities from all facets of student life, namely academic, fitness and leisure related. We also recognised the need to provide students with suggested activities based on their preferences while also recommending activities that would allow them to explore and step out of their comfort bubble.

The brainstorming and detailed examination of the HMWs that started the thought process allowed each team member to move in parallel to sketch some early ideas. The solutions proposed provided a clearer path that we were to undertake in the process of sketching.

### **3.1.3 Key Assumptions**

Assumptions are structured as 9 if-statements after translating HMWs to Ideas, for the sake of being ready to carry out subsequent tasks like sketching and building the core prototype functionalities.

- If hard-working students are being shown the activities that other students do, they are more likely to add more diverse activities into their schedule.
- If a pre-scheduling process is used, students will have a more compact set of study activities which makes them wish to spend more time on fitness.

- If students are receiving some suggestions for leisure/fitness activities that other users of the app prefer doing, their leisure/fitness activities will become more appealing.

Linking back to the three Personas that have been generated within section 2.2.9, these three assumptions above correspond to the group of people who would rather prefer achieving good grades than doing fitness, which means that they are not aware that fitness and leisure can as well improve their academic performance. Due to this, the team decided to emphasise fitness by showing them what other similar people do to increase their academic results, trying to help them in building their study schedule to find out what they will be doing with their free time, as well as presenting them a range of activities that can be done besides studying and what is the impact generated.

- If students are being shown which way exactly is more efficient every time they are deciding to do one particular thing, they are more likely to handle stress better.
- If students have communicated with other people that are different to them, they are more likely to make a change in their schedule.
- If an enforcement tool is used, students will do things in a more timely manner.

It is indeed not counter-intuitive to spot that assumptions 4-6 refer to the group of people who spends too much time on leisure and gets a little bit stressed for not putting enough time into studying, which exactly matches the third Persona. Therefore, the team decided to do three things for each assumption, which later can be included as one of the tests. One is to try to recommend to them some good ways of doing one particular thing when they are making decisions by comparing them with other people that are doing the same thing as them, in order to make sure that they are not wasting too much time doing the things inefficiently or incorrectly. Another two is to put them into contact with other people who do a great job in balancing study and fitness, for the sake of emphasising the importance of consistently working towards their goals and staying motivative, as well as try to help them focus more when they are studying so that they can get rid of the stress generated by the academic deadlines.

- If students are being compared with their peers, they are more likely to robustify their planning and scheduling and make even more progress in their studies.
- If students have been given the opportunity to share their knowledge and skillset with others, they are more likely to be recognised by more people.
- If a reward system is used, students will receive more encouragement and acknowledgement for the things they have done.

The last three assumptions, however, target the group of people who already had a very good balance of fitness and study activities in their schedule, as what is been mentioned within the second Persona. With this in mind, when dealing with this group of people, the team decided to not only make them altruistic by trying to create a platform for them to make contributions to the student community and provide their services, outlined as assumption 8, but also seek further improvement of their overall performance by introducing a healthy competition between them and their peers, as well as providing them with incentive and motivation for their work, which is been specified as assumption 7 and assumption 9.

### **3.1.4 Sketches and Ideas**

This stage was yet again a chance for every team member to express freedom and creativity. This was important to allow us to compile as many ideas and approaches as possible. Various sketching tools were used from the humble pen and paper to digital sketching on tablets.

We then pitched each sketch and explained the features included while justifying their purpose. This was an enlightening process as it opened our eyes to the various possible solutions and approaches that we could use to solve the problems posed by the questions. The key difference between sketching ideas and answering the HMWs is that this stage is more practical and produces more concrete outcomes that could be used as

a reference when explaining ideas.

Some of the sketches that we considered to be very insightful are included below for reference. For a full library of sketches, please visit the Miro board.

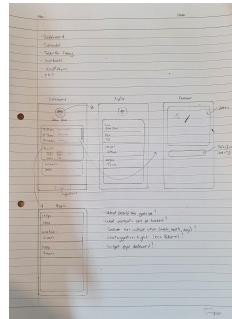


Figure 6:



Figure 7:

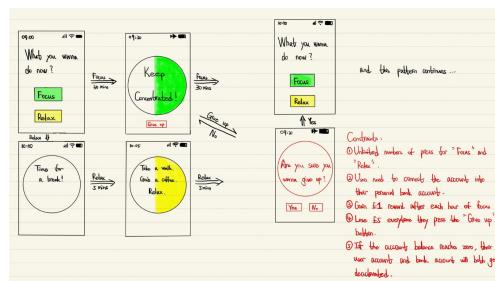


Figure 8:

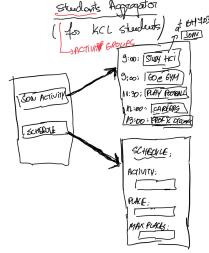


Figure 9:

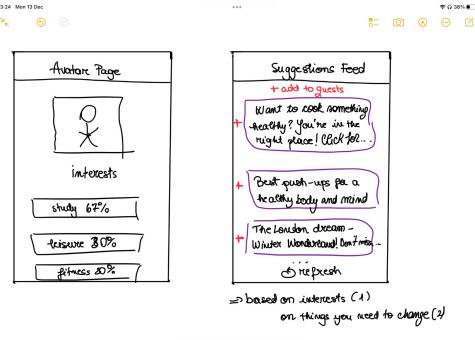


Figure 10:

### 3.1.5 User Interface and User Experience

On top of the requirements derived from the research and analysis stages, we also set a requirement to ensure a cohesive user interface. While this requirement was not explicitly obtained from the research process, ensuring a simplistic yet functional approach are inevitably an important feature of any software application.

In order to ensure a proper flow in design and a positive user experience, we research extensively on good styling practices and came up with a style guide. This style guide encompassed colour themes and component designs.

We decided to build our prototypes with a dark theme in mind. This was to align it with other applications in the application marketplace that have adopted dark modes to preserve battery and to be easy on the eyes. Nonetheless, if we were to develop a full-fledged application, then we would definitely provide different themes to suit the users' preferences.

To further standardise the prototyping process, we decided to use the iPhone 13 Pro Max as our prototype frame. Hence, we also took into consideration the design of the iOS operating system as inspiration for our prototype. This was to ensure that the user would be familiar with the app from the start.

## 3.2 Prototype

Link to Figma:

<https://www.figma.com/file/dWNPBiY5cmY4Wt9nt5T1GV/Human-Fitness-Interaction?node-id=0%3A1>

According to the problem statement that has been generated within the earlier section, as the app mainly focuses on helping students schedule activities and keep track of their goals, our team decided to adopt a

horizontal approach with high fidelity, aiming for providing users with a wide range of functions/interfaces but with little detail, as well as making the whole system as interactive as possible.

### 3.2.1 Requirements

From the sketches and solutions proposed to the HMW questions taking into consideration the ideas developed during the discussion of said sketches, we devised a high-level requirement list to outline the general idea of the features that are to be included in the application. In doing this, we employed the MoSCoW (Must, Could, Should, Would) principle to prioritise requirements and to allow the project to be feasible and the goals to be attainable.

Table 3: MoSCoW principle

<u>Must:</u> 1. Provide the user with a scheduling/timetabling tool 2. Ability to sync with desired calendars 3. Create events 4. Focus mode and Reward system 5. Simplistic and modern UI	<u>Should:</u> 1. Reward system 2. Points leaderboard 3. Ability to connect with friends 4. Personalised activity suggestions
<u>Could:</u> 1. Activity search engine 2. Fitness tracking 3. Weight and body composition tracking 4. Nutrition tracking	<u>Would:</u> 1. Integration with other applications 2. Instant messaging

### 3.2.2 Specification

Our prototype is specified to test if users can thrive in an environment that helps them to self-reflect on their current time allocation and to try to seek for developing time management skills (connection with similar/different people, score incentive, reflection on the current status). These specifications are crucial to the problem statement. One reason would be that our users are finding it hard to get a balance between activities (we needed a tool to help them identify why it is hard to find equilibrium). Another reason is the lack of motivation. We believe that this can be resolved by placing students in a socio-competitive environment that just has the purpose of showing them how other students manage to motivate themselves. One more reason would be the level of stress students feel while studying. We believe a countermeasure for that would be the possibility of connecting similar people and also a feature that might allow students to see how other students manage their time to avoid stress. We believe that all of the problems identified in the problem statement could be resolved with the development of **time management skills** for a single person.

From the analysis, we have managed to find out that the main activities the students are concerned about are related to fitness and studies mainly. Moreover, there seems to be a ternary factor which is predominant in their schedules: leisure activities. The prototype will also help us test if we can separate the activities our users do in these categories (Study, Fitness, Leisure) or not.

### 3.2.3 Core Functionalities

Below are the main features of our app:

**Distribution of events categories (via a pie chart) - an identification tool and the appartenance to different groups (self-reflection and current status):**

- On the onboarding flow, the user is asked to self-identify with regards to how much time they spend on different activities. This will be used to help them connect and compare with other people with the purpose of finding out how others tackle the problem of time management (*"work at a certain time, and once you're done with it, you want to focus on anything else besides studying"*).
- By using the app, the pie slices will decrease and increase in size based on the category of events the user completes.
- For identifying people, the background of their avatars will be coloured in the most predominant category's colour.
- For analysing the progress, the users will have a "Statistics" page where they could check their progress.

**Time Management Score - an incentive for motivating students and for learning purposes:**

- Students should learn how to be more organised and we present an engine that helps them stay on track by estimating how effective they are in scheduling. This feature might not seem really relevant, but it helps students connect with better time managers and learn from their history of events.
- The user is incentivised to organise their schedule better by having negative scores on giving up on an event and rewarding them for completing activities.
- We do not want to make the users focus just on that, that is why we do not have this feature displayed on the home screen, but they should be aware that this is how the engine of the app tries to help them master time management.

**All in one calendar:**

- The user should be able to have all of their events in one place so we propose a calendar tool that also allows imports from other apps.
- They just have to reflect a bit on what category does the type of event fall into (from Study, Fitness, Leisure) so their pie can be updated based on what kind of activities they complete.
- The calendar tool should be easy to use. It also has to work without an internet connection so that users can see the upcoming event and schedule new events at any time.

**Concentration enforcement tool:**

- We would like our users to be committed to organising their schedule and continue developing their traits while using the app (*"I'm very organised so I always write my free slots in my timetable and assign them to either sports or things that I have to do"*).
- The user will have the opportunity to access the upcoming event with ease and has multiple choices of what to do next. There is always an opportunity to relax while doing an activity that won't affect their score, but giving up on a scheduled activity might show that there is a problem with their time management skill. Increasing the score should not be a priority for the users. We consider it as another measure to self-reflect and they should be aware that this exists in the engine of our app and also how it affects their experience.

**Social environment:**

- It is important for students to get to know others who are in the same situation or have similar profiles, to develop themselves together.
- Our prototype has a way for them to connect with people and filter them based on some metrics. They can also compare themselves with others, to understand how others manage their time.
- Our tool proposes simple, yet effective tools to find persons of interest either by searching in their own academic environment, in the same cluster based on the activity types distribution or in the user base.

**Recommendations - 2 types of suggestions are shown for the users:**

- Onboarding fitness activity suggestions (based on an engine that tries to match the new user with the existing ones and to try to estimate which fitness activities suit them). We would like to have a way to make people interact with physical activities from the beginning. These will be added automatically in the user's calendar but can be removed later.
- Persons of interest:
  - Users can follow other users to keep track of their activity.
  - We would like only the most active followed users to be shown on the home screen for anyone. This is an incentive for users to compare with their most active friends and learn from them (an active user might have a really high time management score).

**Based on the Empathise & Define analysis there were more alternatives that were considered:**

- Crowd-sourcing schedules & Automated decision making: given the uniqueness of each individual it may not be feasible to just blindly grab ideas from a large group of people. Letting users explore their community and deciding where exactly to improve afterwards may be more beneficial.
- Multiple user events based on similar activities: enhancing the communication between users is deemed irrelevant, users are supposed to just make comparisons with others and seek improvement for their own time management skills.
- Actual rewards for awarding users' time management skills: this has been replaced by the time management score as an incentive so as not to let users get hung up on their actual performance but instead focus more on self-reflection.

We designed the prototype in order to test the user's ability to balance their studies and fitness activities, but with a third activity category (leisure) and in an environment based on self-reflection and comparisons. We believe that the prototype is sufficiently complete to address these questions since the team followed the exact directions stated in the Ideate phase, but we also left room for improvement.

With regards to the visual/interaction design we tried to keep the UI elements simple and the flow of interaction smooth. It is highly important for the interface to be as simple and intuitive as possible so we could infer more from the behaviour of users in the app. The buttons follow the rules mentioned in the usability goals theory and there are not any complicated UI elements. We have 2 different flows for the user:

- A straightforward profile creation (where the user has a set of frames to pass through and are notified of stages left until completion).
- An intuitive flow for an existing user to log into the app.

### 3.2.4 Individual Prototypes

From the requirements, we delegated requirements and features to be converted into prototypes. Each of us was free to implement it how we prefer while adhering to the predetermined style guide. This allowed creativity and aesthetic expression.

Below are some of the individual prototypes that were designed.

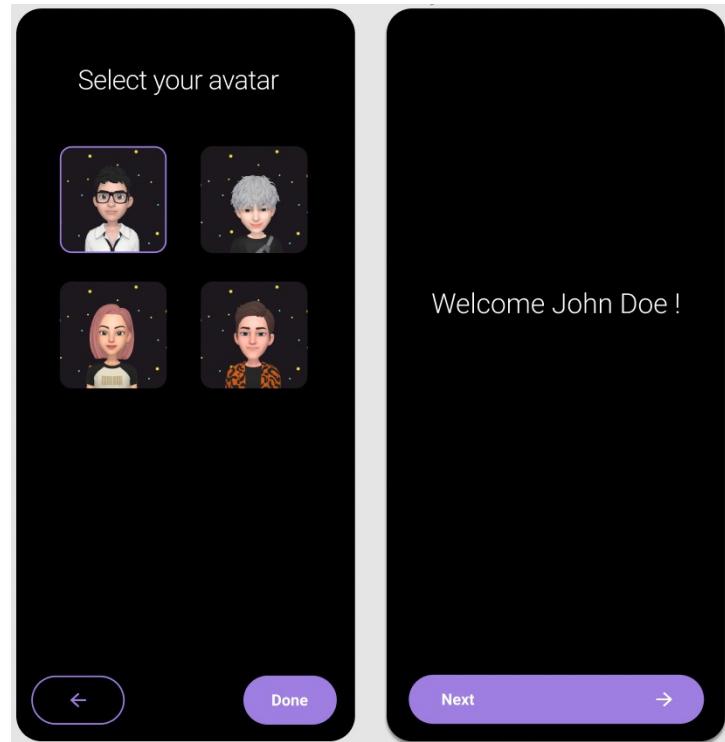


Figure 11:

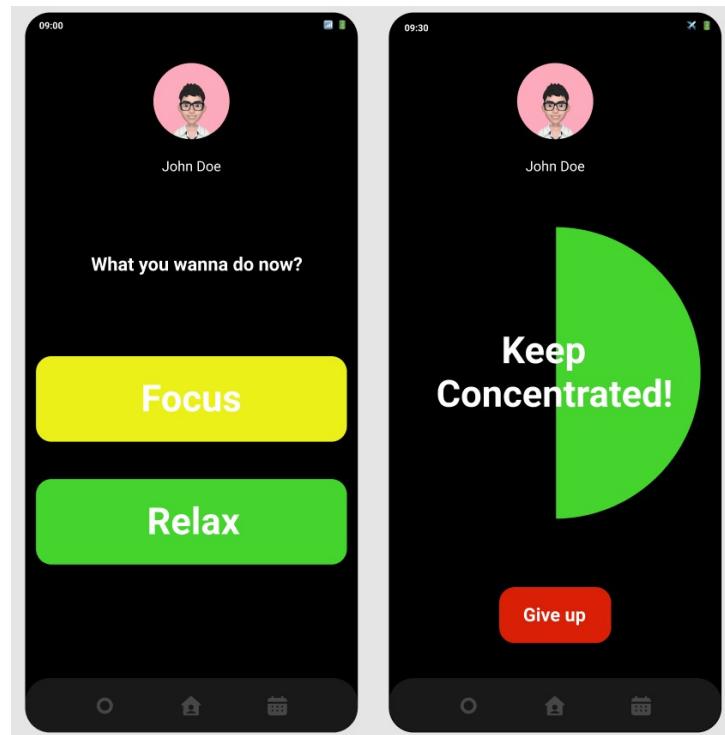


Figure 12:

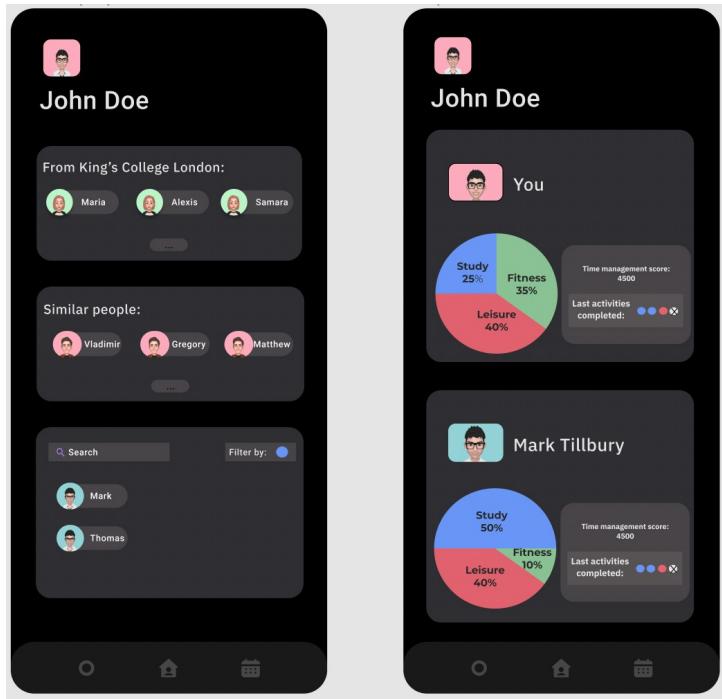


Figure 13:

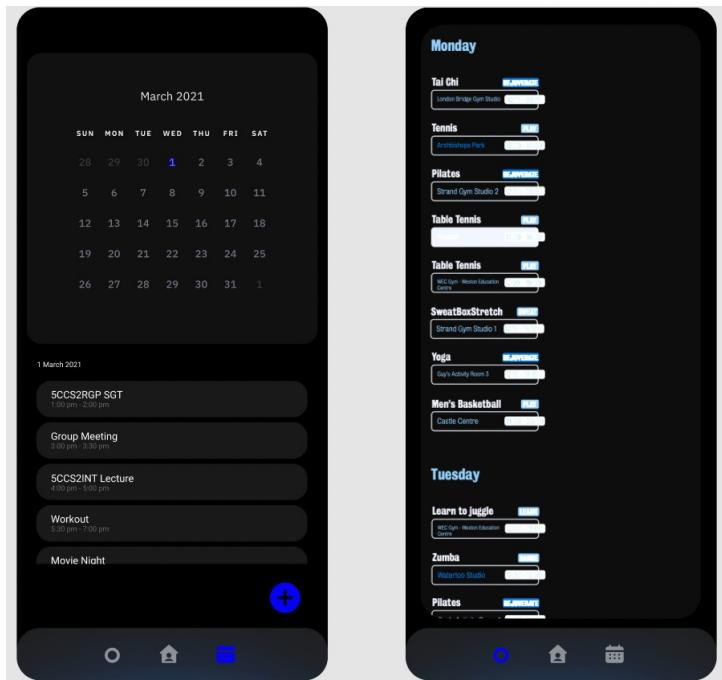


Figure 14:

### 3.2.5 Final Prototype

Once we designed the individual prototypes, we assembled to merge and integrate different parts of the app to produce one functional prototype. During this process, we made some design changes and alterations to the approaches presented. We also decided on the flow of the application and the links between different frames.

We took the horizontal prototyping approach where we aimed to produce all the front-end designs without going into the implementation and back-end. One of the major points of discussion was the mechanics of how we would want the user to get suggestions for activities. There was some ambiguity in the initial idea which led to in-depth discussions and finally some adjustments to simplify the interface while maintaining functionality.

We iterated on the prototypes until consensus was achieved. In other words, we made alterations and modifications until the interface was easily understandable by all team members, the flows and connections were sensible, the functionalities were comprehensible and the design was unified.

Below are some frames from the final prototype and some of the links between the frames.

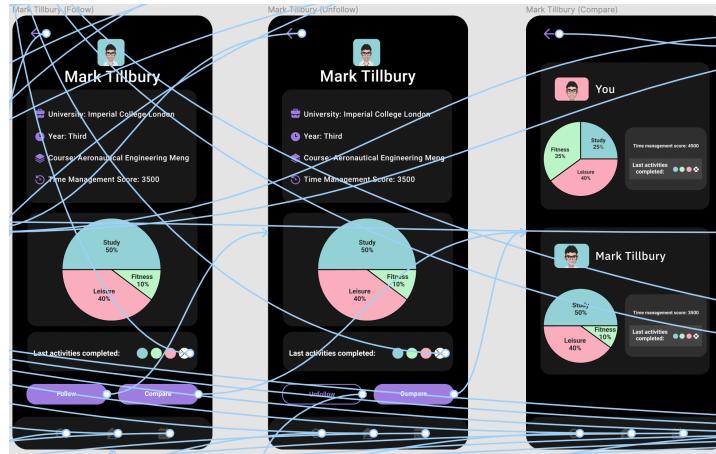


Figure 15:

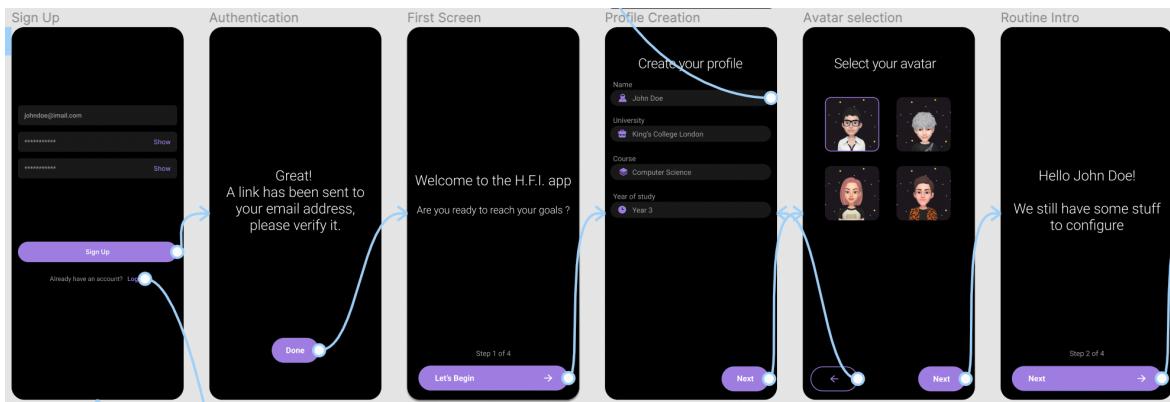


Figure 16:

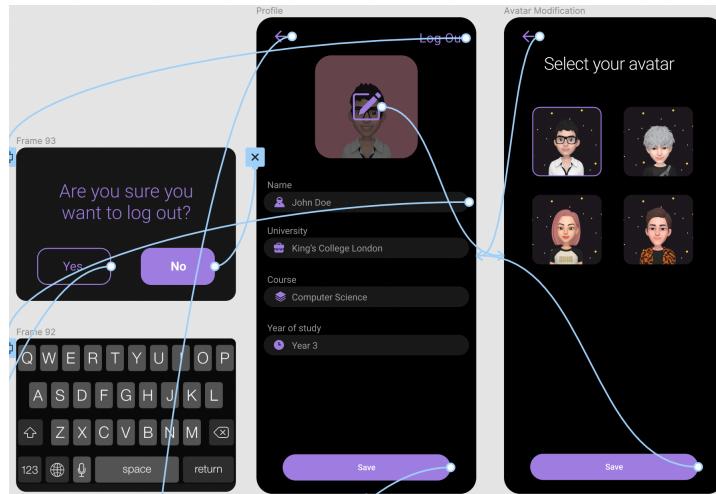


Figure 17:

### 3.2.6 Summary

Based on the assumptions collected so far and looking back to the previous stages, we have come up with a short summary that is reflective of our prototype. Starting with the generalisation of the HMWs with respect to how might our analysis be applied in the testing phase, we have listed the following about our prototype (features of the prototype and their user in the testing phase):

- Pre-scheduling timetable (importing academic timetable from sign-up, suggesting fitness events, offering points for good time management skills):
  - We will test if the users would prefer doing more fitness if they are confident in their pre-scheduling technique.
- Fitness suggestions (in the sign-up flow):
  - We will test if receiving this suggestion, users will be more balanced to schedule more fitness activities in their timetable.
- Self-reflection pie (in sign-up) & Background colour of the avatar:
  - We assumed that there are 3 types of users for our design context and we will try to test if adhering to groups is helpful for the users to diversify their schedule.
- Comparing with other users:
  - We will test if comparing to other students will help the user diversify their schedule.
  - We will test if users might be more committed to their schedule if they compare to others (where the **time management score**, **activity history** and **statistics for the pie distribution** have come into play).
- Following and unfollowing users & Searching for similar/different students:
  - We will try to test if making students interact with some students that are similar/more different than them they are more likely to make a change in their schedule.
- Concentration enforcement tool:

- We will try to test if students will tend to do their activities in a more timely manner and if they can learn how to develop their time management skills (giving up on a task might affect their score).
- Reward system:
  - We will test if students will receive more encouragement and acknowledgement for the things they have done and they can learn how to organise their time better.
- Statistics & Activity history:
  - We will test if sharing their knowledge and experience with others might help students recognise they are doing a good job, but also help other people.

For all of the tests above we are going to use the flow already set up or try to set up new ones and run a quantitative/qualitative procedure in a lab-based study (the experiment will be held on Microsoft Teams, but we will set up the environment to test only specific parts we are interested in about the prototype). Based on the problem statement we generated, we think that these are the most important parts of the prototype that should be tested in order to dictate the resolution of our design problem.

## 4 Testing

### 4.1 Usability Heuristic Analysis

With a critical eye, after producing the final prototype, we moved to the next step: finding potential problems and linking them to the corresponding heuristic, followed by an analysis. Our goal for the app is to give the users all the means to have an effective and efficient journey, so the first step is to note the possible problem. However, usability heuristics analysis seems irrelevant for the prototype as it is not the final app. It is obvious that the non-clickable buttons in the prototype would be functional in the final app, as well as the all AI system on which the app would be built. The repetition and the lack of actual functional features are normal at this stage of the prototype but would need to be tested on the final product to verify if the app respects the usability heuristics. One small feature that we are not fully happy with would be the following:

- **Issue:** After and during the completion of the login/signup flow, no pop-up appears (ex: password requirements, password different from the ‘repeat password field’).  
**Severity:** 3  
**Heuristics violated:** Visibility and feedback.  
**Description:** The user has no idea if the password they input is wrong or it’s just the app that crashed.

### 4.2 Study Protocol

We then continued our analysis with a field study that helps verify our assumptions.

#### Objective:

The aims of this usability study are to mainly test the following:

- Users understand the interface and flow of the prototype.
- Users are able to understand how the focus mode works.
- Users understand the time management score functionality.
- Users find the features and functionalities useful.

The above list is the most important points that we would like to test and obtain feedback from the participants. This is because they build up the most important components of the application and it is important that the UI emphasizes what potential users are already acquainted with. This is so that the app does not have a steep learning curve causing cognitive load on users.

#### Description of the system being tested:

As outlined in the prototyping stage, the prototype was built on Figma. It is a prototype mobile application that consists of most of the design components that would be in the end product. Since we employed a horizontal prototyping approach, the features and functionalities present in the prototype were not fully implemented. They were implemented enough to give the participants an idea of what a deployed version of the app would look like.

#### Task environment and materials:

Due to the current pandemic situation, we decided to continue with the usage of Microsoft Teams as our primary means of carrying out this study. This was to reduce in-person interaction as much as possible to align with the health guidelines. Users were provided with the Figma link to the prototype that has been developed.

#### Participants:

- The participants recruited are members of the King’s College London student body. This is because the application developed in this project is directly aimed at KCL students at this stage.

- Potential participants were contacted via email, WhatsApp and other social media avenues. Some members of this team knew some students personally, so they were recruited in person.
- The participants were informed of the project and consent was sought for the recording of audio and video as the usability study hinges heavily on the participant actively going through the prototype.
- We are targeting to have one person from each cluster since we will be proposing some specific questions for each category.

### **Methodology:**

- Participants were informed of the purposes of the usability study and briefed about the features, functionalities and design of the application.
- Participants ran the flow on Figma on their personal computer and shared their screen with us.
- The video call was recorded so that we could use the findings as sources of inspiration and reminders on the parts to update or improve.
- The participant's interactions and gestures were important to gauge their understanding and acceptance of the prototype.
- The test was designed to take about 30 minutes per participant. This is important because if they were to take longer, it would mean that the application is too complex and time-consuming to use on a daily basis. This would negate the main purpose of this app.

### **Testing guide:**

With the test features implemented in the proposed way and using a controlled experiment we will be asking users to follow some steps:

- Go onto the signup page and follow the instructions to create an account.
- Answer the questions:
  - What would be the next step you would do now?
- Have you noticed the change in your profile background?
- View your timetable:
  - Add or delete an event.
  - Return to the home screen.
- Try to edit your profile:
  - Return to the home screen.
- Answer the question:
  - What is the upcoming event?
- Start the event:
  - Give up:
    - \* What does giving up mean?
    - \* Would you give up or continue?
  - Complete
  - Relax
  - Return to the main page

- Answer the question:
  - How would you discover new people?
- Click on add friends:
  - Expand one of the people that might be of interest to you.
  - Answer the question:
    - \* What is their time management score?
    - \* What kind of activity did they do last time?
    - \* How will you interact more with this person?
    - \* How does your schedule look like compared to the one of this person?
    - \* Would you consider changing your timetable knowing that this person is more experienced than you are? If yes, how would you change it?
- Answer the question:
  - When is your upcoming event?
  - What would you do to cancel the upcoming event?
  - What does cancelling mean?

For the whole duration of the experiment, we will use the “think-aloud” method and we will continuously ask the participants to express their thoughts. We will use the feedback as qualitative pointers for our analysis.

#### **Metrics:**

- Quantitative:
  - The time taken for the whole signup flow.
  - The clicks distribution on the next feature to visit after reaching the home page the first time.
  - The time taken for the user to spot the background colour change of the avatar.
  - Boolean for storing the fact that the user has spotted the profile colour change on their own or not.
  - The count of events that this person might change based on the comparison with other people.
  - Number of clicks on the menu bar to reach calendar.
  - How many suggestions are appealing for the students based on fitness experience level?
  - Number of clicks on expanding suggestions.
  - Number of clicks on the video itself.
  - Number of comparisons with similar/different people.
  - Number of completed tasks.
- Qualitative:
  - How does the user explain the colour change of the avatar?
  - What would the user do after seeing the home page the first time?
  - Feelings with regards to the signup flow.
  - Decision of who to follow is made by each user.
  - Decision of what to do next.

### 4.3 Study Analysis

After data collection, the team has suggested undergoing the analysis based on the 9 assumptions addressed within the earlier section. It is undeniable that some bias may appear due to the lack of users involved in each cluster, but still, the essence of going through all the assumptions and making evaluations are not supposed to be neglected. Hence, a full list of assumptions and its corresponding tasks associated with users is being constructed.

The “Validity” field here is just a short summary due to the space constraints, actual study protocol and its in-depth analysis can be found within the Miro board.

- **ID: 1**  
**Assumption:** If hard-working students are being shown the activities that other students do, they are more likely to add more diverse activities into their schedule.  
**Task:** Allow the users to compare to others.  
**Validity:** Invalid due to the lack of trust of our compare feature as they would like to have more interaction with other users.
- **ID: 2**  
**Assumption:** If a pre-scheduling process is used, students will have a more compact set of study activities which makes them wish to spend more time on fitness.  
**Task:** Allow the users to auto-complete their schedule with their academic timetable.  
**Validity:** Invalid due to the fact that users are more likely to first take a complete tour of the app, rather than jump straight to the calendar section.
- **ID: 3**  
**Assumption:** If students are receiving some suggestions for leisure/fitness activities that other users of the app prefer doing, their leisure/fitness activities will become more appealing.  
**Task:** Suggest users some fitness activities.  
**Validity:** Valid as all 3 participants have shown that they have a good interest in scheduling this type of suggestion.
- **ID: 4**  
**Assumption:** If students are being shown which way exactly is more efficient every time they are deciding to do one particular thing, they are more likely to handle stress better.  
**Task:** N/A - likely to be one of the future development.  
**Validity:** Invalid due to the missing of its specific implementation.
- **ID: 5**  
**Assumption:** If students have communicated with other people that are different to them, they are more likely to make a change in their schedule.  
**Task:** Follow and unfollow users.  
**Validity:** Valid as they have all shown a great number of compare clicks, which infers a high enthusiasm of connecting to a variety of people in order to learn something from them.
- **ID: 6**  
**Assumption:** If an enforcement tool is used, students will do things in a more timely manner.  
**Task:** Simulate real-time elapse when the users are studying.  
**Validity:** Valid as every user the team has interviewed has a good understanding of what “give up” means in the context of this app, as well as its corresponding effects.
- **ID: 7**  
**Assumption:** If students are being compared with their peers, they are more likely to robustify their planning and scheduling and make even more progress in their studies.  
**Task:** Allow the users to compare to others, with a visual display of their time management score.  
**Validity:** Valid since they are all able to quickly locate and state each time management score, plus making the comparison.

- **ID: 8**

**Assumption:** If students have been given the opportunity to share their knowledge and skillset with others, they are more likely to be recognised by more people.

**Task:** Allow the users to view their own search history and each corresponding statistic when searching people.

**Validity:** Invalid as there is insufficient evidence to show that sharing users' experiences with others will improve their recognition, but instead limited to just making comparisons regarding users' actions when looking for people.

- **ID: 9**

**Assumption:** If a reward system is used, students will receive more encouragement and acknowledgement for the things they have done.

**Task:** Update the users' time management score every time they have completed one activity.

**Validity:** Valid as the users have all realised how giving up an ongoing event or cancelling an upcoming event impacts their time management score.

## 5 Conclusion and Future work

### 5.1 Conclusion

This project was a first-hand human-computer interaction and design for the whole team. The topic of mixing studies and fitness was interesting and insightful for every member as it was related to student life. The process of going through the five steps of design thinking give a strong understanding of how most of the day to day objects and applications are developed. This semester-long assignment offered the opportunity to apply various practical tasks and methods to the taught theory, from interviewing people to designing an app.

The project can be considered as successful, as the team is proud of the final work. However, some improvements could be and could have been made. Starting with the interviews, only a small category of people were questioned, restricting the extracted data. Maybe interviewing more students from overseas universities could have been more relevant. The lack of means, resources and experience to apply the theory might have altered the final result. Although the process remains the same in theory, the work produced by a professional team of designers would have been unquestionably different, with a contrasting final prototype. Furthermore, the time restriction pushed the team to accelerate some steps that would have required longer work and analysis.

Functionality wise, the whole app is based on a non yet existing artificial intelligence that will schedule and recommend adequate activities around the mandatory university timetable, and based on the user's preferences. One of the biggest assumptions for the application to operate properly would be that the AI is highly functional.

The issue around data privacy could be discussed as the application would know a lot about the users' life and behaviours, where they will be and at what time. An improved security system would thus be required.

The aspect of users' fidelity is also important. In order for the app to serve its purpose, users have to base their day around the app. Moreover, the interaction and comparison between users are relevant only if there is a high fidelity to the app.

### 5.2 Areas of improvement

Some other ideas and features of the app have been discussed with the team. The lack of time and resources are the reason for not having implemented them. Some interviewees also mentioned features that could be added. For example, the aspect of colours related to the activity type and the avatar background summarising the preferred type of a user was difficult to understand by the interviewees. Explaining this functionality in future work would be a great improvement.

There has also been some discussion about the implementation of a messaging feature to interact between users. It seemed relevant as it could be a way to have all in one app and improve communications. It could also be an approach to coordinate users with a similar activity pattern, or just to enhance peer to peer motivation. About motivation, a testing participant mentioned that he would have appreciated having more sources of motivation. A feature could then be added where users can find motivational advice or videos associated with a specific activity type. All of these potential future features will therefore require additional testing.

Overall, it has been fascinating and delightful for each team member to work on this project, our biggest frustration being to not have an actual functional app, yet...

## 6 Appendix

Interview transcripts:

[https://emckclac-my.sharepoint.com/:f/g/personal/k1923101\\_kcl\\_ac\\_uk/Etkr5aUnRcZOuY2FfqIYXsoBV8E7DoEbMF9UPzwYpjTqmg?e=fSCfeP](https://emckclac-my.sharepoint.com/:f/g/personal/k1923101_kcl_ac_uk/Etkr5aUnRcZOuY2FfqIYXsoBV8E7DoEbMF9UPzwYpjTqmg?e=fSCfeP)

Demographics:

[https://emckclac-my.sharepoint.com/:x/g/personal/k1923101\\_kcl\\_ac\\_uk/EcDOZU0y67RKmJbK2sPrclcBBgC-6z3pm\\_Nc-EU989ZBzQ?e=DGY774](https://emckclac-my.sharepoint.com/:x/g/personal/k1923101_kcl_ac_uk/EcDOZU0y67RKmJbK2sPrclcBBgC-6z3pm_Nc-EU989ZBzQ?e=DGY774)

Additional Notes:

- The report has been completed up to 2.2.10 “**Problem Statements**” for the 1st check-in submission (12th November 2021).
- The changes the team has made since the 1st check-in submission was written in **blue**.
- The report has been completed up to 4.1 “**Usability Heuristic Analysis**” for the 2nd check-in submission (17th December 2021).
- The changes the team has made since the 2nd check-in submission was written in **violet**.