Master's Thesis

How might we provide mental health support for international students at UNIST with the usage of digital technologies

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Executive Summary

With the current increase of interest in mental health conditions, such as depression, anxiety, and stress, there has been investments and researches around the globe. However, there is very little focus towards a minority of international students and even less work on the design field for them. This thesis aims to provide mental health support solutions with the students on the role of decision-makers and put the designer on the role of facilitator at the South Korean university environment. Thus, we were able to provide empowerment to users with the user-centered design methodologies and design thinking. Combining these methods with a design sprint to further tailor down and bring meaningful solutions we were able to discover guidelines towards designing for international students mental health based on the following needs: trust, staff limitations, information, awareness, and perception. Based on our empirical studies we were able to conduct a design sprint with six students from UNIST and found out that the solutions provided by them mostly fall into four different categories: social fabric, advising and supporting, information and guidance with digital solutions, and improvement of wellbeing or quality of life. With the aim to tackle those needs we decided to continue the research with a temporary solution based on a chatbot. On this digital application, users would be able to do screenings and check on their mental health status and, provided with their scores, be able to see other students result in the form of an average score and their own progress on that screening score, creating a reliable resource for future encounters with health care professionals. In the end, we are able to provide a different point of view on a rising field of interest for technology and data use with guidelines that can help design and how we believe tackling them can be done with a digital solution.

Keywords: International Students; Mental Health; Human-Centered Design; Guidelines for Mental Health Support

How might we provide mental health support for international students at UNIST with the usage of digital technologies

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A thesis submitted to the Graduate School of Creative Design Engineering, UNIST in partial fulfillment of the requirements for the degree of Professional Master of Design-Engineering

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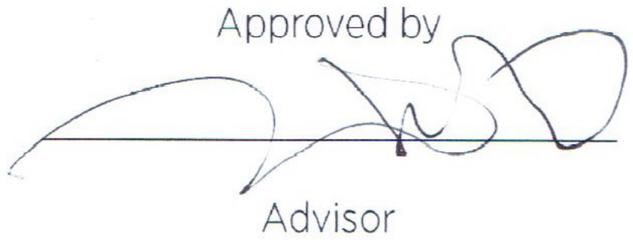
Approved by



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01. 03. 2019

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I Introduction

Designing for the wellbeing is considered an emerging trend in our field. In a nutshell, it means creating a more pleasant experience and is mostly observed in the architecture field. Those architectures were created with the objective to encourage residents and users to lead a healthier lifestyle by creating a more positive atmosphere [2]. Although this concept is very well implemented in architecture, very few studies on the design field focus on the relationship between the service system interaction and well being [3].

According to Miller [4], "Wellbeing can be supported by encouraging and enabling effective action, prediction, and control, satisfying social interaction, and mindfulness, physical involvement, and enjoyment.". Therefore, design for wellbeing contains a wide range of possible solutions. One of them is the robot developed by iFlytek to support medical care in China. The robot provides early diagnostics and helps a faster treatment of the patients in the hallways while waiting for the doctor. The robots also automate some of the paperwork doctors have to deal with, leaving them with more time to attend to patients [5].

Designing for well-being also includes the design of products or artifacts which affects someone's perception of the self, as it is the case of Macarow [6] on her study on how engineering and design can help conceal surgery scars. The subjective perception of hospitals and medical environments aligned with the design of experiences on a service can also trigger wellbeing, as found on Gunn [7]. That indicates the benefits of integrating Designing for Wellbeing techniques to improve mental health.

A key demographic that is highly susceptible to mental health risks are university students. Evidence suggests that although university students benefit from a more socially rich lifestyle, they are at higher risk of depression [8], anxiety [9] and stress [10].

At South Korea alone, the surge of mental disorders is reported at 27.6% [11]. A study showed that out of 5,102 Korean adults, 25% had suffered a form of mental disorders. Such as depression, schizophrenia and alcohol abuse at least once in their lifetime [12]. Furthermore, Korea's suicide rate has been the highest among OECD nations for ten consecutive years [13]. Aligned with that information, 75.3% of people who attempted suicide experienced one or more mental disorders [11].

The importance of mental health wellbeing influenced the Korean government to provide

several initiatives to raise awareness and make treatment more accessible to the public. Like, the 'First Five Year Plan for National Mental Health Promotion,' targeting all Korean society mental health care [11]. Several nationwide initiatives targeting university students had also been established, such as the healthy campus initiative by Seoul National University in 2012 [14]. Unfortunately, however, such initiatives mainly target Korean students and neglect international students. Despite the rising number of international students opting to pursue academia in Korea [15].

International students also face a vast number of challenges: language and cultural barriers, social isolation, financial hardships, difficulties finding jobs post graduation, and lost identity [16]. Due to that they often find themselves in an even more vulnerable situation [17]. However, due to the lack of awareness of the services provided for them, international students tend only to seek help when they suffer a physical condition [17]. Creating a gap for the services regarding mental health system-services towards this specific target.

At the university where this research was conducted, there are various student activities and efforts towards wellbeing and mental health. According to the UNIST website, there are three student bodies: Student Government Association (SGA), Student Dormitory Council (SDC) and UNIST International Student Organization (UISO), being the last one entirely focused on international students at Campus. The UISO content and engagement can be seen on a Facebook group with the same name where they usually share and moderate information.

Besides those, there is the newly established Human Rights Center, the Healthcare Center and the Unist Center for International Affairs. Even though these services are given to the students, they are still perceived as insufficient for the students who do not speak Korean, being that language is the most prominent reason for that lack of understanding. For instance, on the Healthcare center, only one of the four professionals can employ counseling services in English while also having to do them in Korean.

Therefore, there are gaps in mental health services which are filled and address local students. However, there is still room for improvement regarding international students mental health needs on campus.

Furthermore, understanding the role of design thinking and the user-centered design approach [18], we can see the potential for designers to work with clinicians and people towards answers. Including effectively them both on the process to find meaningful solutions. Besides, with the plurality of knowledge on campus and the perception I had of the international com-

munity mental health, plus my love for technology, this seemed like the perfect scope and aimed for my research.

Based on this understanding, I was able to formulate the following hypothesis:

H) Can we provide mental health support for international students at South Korea with the use of technology?

Understanding the needs of the university students and their localization expertise efficiency, it seemed to me that I could evidence the intersection between what a designer and a clinician could bring to the user concerning solution having the user as a central piece of it.

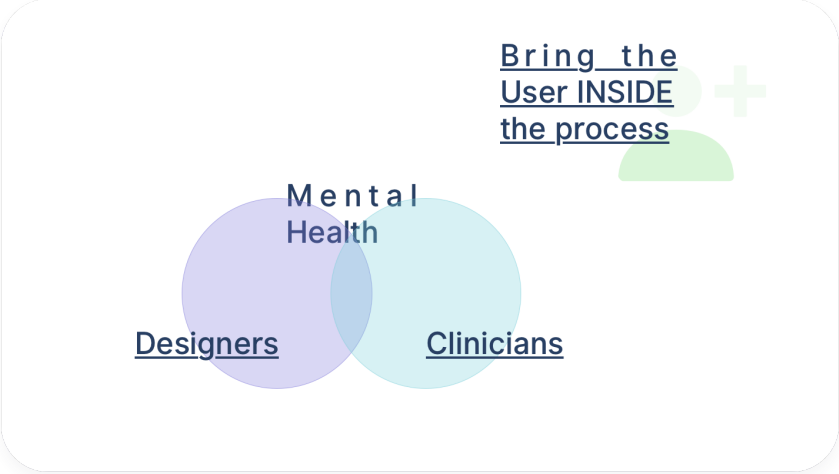

Figure 1: Area of Intersection

Even though digital tools present an opportunity to improve mental care, they need to be used in the right way [19]. There are already algorithms capable of identifying suicidal thoughts based on fMRI brain scans [20] and other less invasive techniques such as social media content analysis to identify vulnerable individuals on social capital, emotions, patterns of interaction and linguistic style [21]. Thus, aiming for more efficiency and a better well being on campus, there is an opportunity for design, as a research field, to discuss and open areas of opportunity towards better mental health for international students with the use of technology and design.

1.1 Design Research

Based on our hypothesis, the scope of research, feasibility, perceptions, background, and design skills, we were able to craft main and secondary design questions:

Main Design Question

Q) How might we provide mental support for international students at UNIST with the usage of internet intervention technology?

Secondary Questions

- How might we provide a feeling of trust for the students?
- Do the international students in Korea have problems related to stress and depression which can be solved by design?
- Would international students mental condition be improved after using this service?
- What are the mental health-related issues that can be tackled with design?

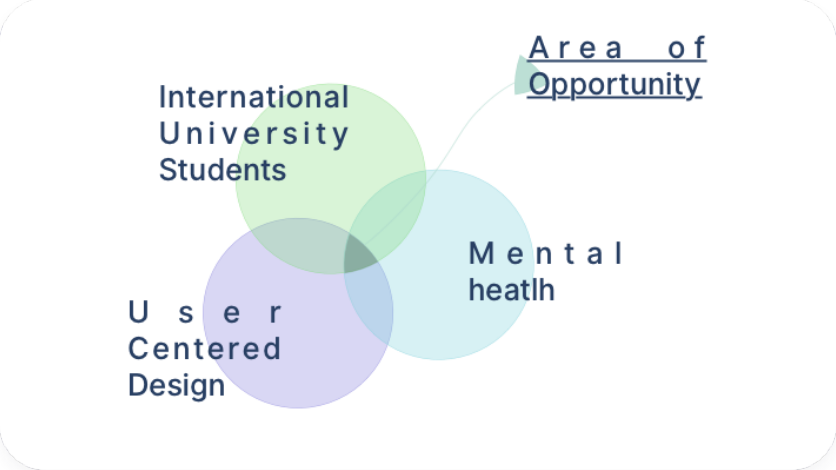

Figure 2: Area of Opportunity

Therefore, we can conclude that there is an area of opportunity where all those areas converge, as illustrated in the diagram below.

To sum up, the contributions from this research are two-fold

a) Outline opportunities on the intersection between mental health service for international students, design, and technology.

b) Empower of user personal knowledge for the development of meaningful solutions.

II Methods

The methods used on this thesis work were inspired by the Human Centered Design - HCD - and aimed to have the user with the critical and principal perspective of the problem-solving process, acting together with the professional designer. The methods which are described in this work allowed us to shape and develop a design solution and understand how that would be able to impact people's lives with it. The designer which investigates and explores this area of the domain is known as the user experience designer - UX designer. This term will also be explicated, using as the base for it the definition by Donald Norman [22] and Tim Brown [18].

2.1 Human-Centered Design and User Experience

In the understanding of this paper, human-centered design is a combination of efforts towards building more useful and meaningful software [23]. Using the user knowledge and skills in collaboration [24] towards a meaningful solution [22].

In a nutshell, HCD is composed of various elements. The active involvement and understanding of the users towards the process, solution and aim of the design process [23]. Iteration of solutions as a way of gathering feedback and providing enhancement of design solutions [24]. Multidisciplinary teams involvement, as noted by Maguire [23] and IDEO [24], due to the way each one can understand and signify the world and its surroundings onto a design process of feedback and affordances [22]. Another component of the human-centric design is Design Thinking [18].

Therefore, User Experience Design is a field of study which targets the understanding of mental maps as a way to avoid friction and make use, adoption, and understanding of a design solution smoothness [22]. Aligned with this understanding is the Design Thinking methodologies, which understand that the collaboration and active participation of the user on the process of conceiving solutions can fill the gap between reality and the development of a product [24]. This gap happens because our knowledge is on the world itself, and not on our minds [22], therefore understanding the knowledge on various perspectives may provide a more meaningful solution [18] to those which will benefit from it.

What the user should not know is also part of the user experience and should be communicated with feedback, iteration and expressed with design [22]. Therefore, the designer act

as a mediator of what is accessible and what is not towards better user experience, playing a critical role in providing tools and synthesizing user needs into a meaningful solution, resulting in innovation [24].

Design Thinking is a term coined by Tim Brown [18] and later further enhanced by IDEO in its HCI toolkit [24] and method cards [25] as a collaborative set of tools, focused on empathy and creativity to achieve innovation. Therefore, these tools and knowledge turn the designer into a creative problem solver. As noted by Maguire [23], IDEO [24] and the Institute of Design at Stanford [26], there is not only one pathway to achieve an answer. Instead, there is a holistic approach using empathy to explore and iterate solutions towards a more meaningful product [23].

Since there is not only one way to achieve a suitable user experience design methodology [22], we used in this research, the enhanced Double Diamond framework by Dan Nessler [1] as an initial base in order to visualize the design process. On top of it, we used human-centered design tools and agile methodologies described by IDEO toolkit [24] and later on the Design Sprint [27] with slight modifications to tailor fit this research needs.

2.2 Double Diamond

The Double Diamond framework is a 4 phase system created for the projection of various design solutions. It was initially designed by the British Council and further improved by Dan Nessler [1] later on. This diagram allows the designers to orient themselves to diverge and converge depending on their progress [28]. Different adaptations had been used in both academic works such as Koender [29] and also as a developing tool as seen on the Moe Collective - a branch from Hyper Island school of creativity - Skillshare classes [30] and on the IDEO Toolkit [24].

As shown in the illustration above, the diagram is divided into four distinct sections:

- Discover - Identify the problem, opportunity or needs to be addressed by the design while defining its scope with a rich set of knowledge.
- Define - Analyze the data to synthesize the findings into opportunities for a clear direction.
- Develop - Develop into concepts and its supporting components as a holistic experience while iterating with users.
- Deliver - Taking it to launch, gather and reshape the design based on feedback.

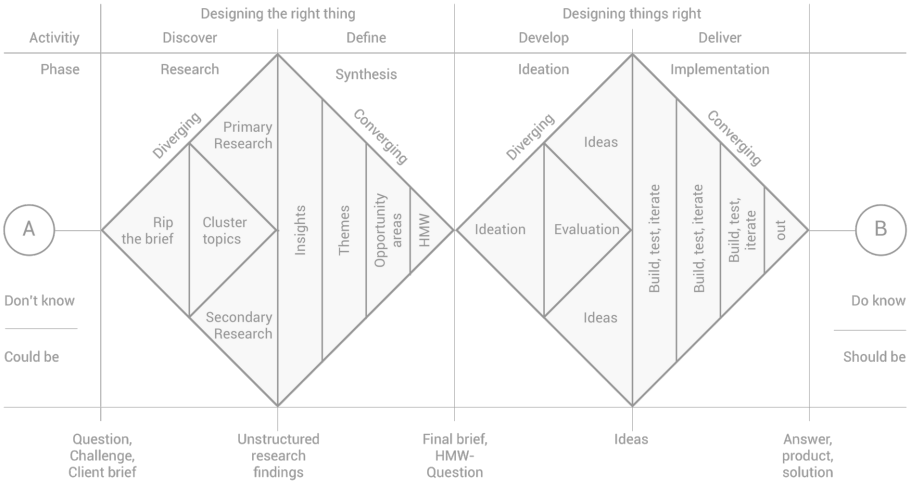

Figure 3: Double Diamond developed by Nessler [1].

This scheme provides a logical system that can work as a roadmap on the design process [1]. It is worth mentioning that in this research, the Double Diamond framework had been modified to tailor fit this service system design needs. Unlike shown in the diagram above, we decided to follow the human-centered design core principle of iteration [23]. Thus we iterated it as soon as the concept was created, establishing an ongoing flow within the design process, making it less linear and more iterative.

The Discover phase was guided mostly by literature research and exploration of different services for mental health regarding foreigners in Korea, including but not limited to, peer support [31] [32], and services offered *in loco*. For this phase, we decided to do four different design methodologies aligned with the literature research: phenomenal study, stakeholder interviews, online questionnaire, and informal interviews.

During the defining phase, we gathered all the data and identified opportunities in which a designer may act and reflect on. Those were categorized and ranked in priority regarding feasibility, user value, and adaptability. Feasibility in order to be created, user value as an intangible set of features which can aggregate benefits to stakeholders and adaptability was a way of understanding where those services would be used and conducted at UNIST. Therefore, with the understanding of the services itself, how they work and the way people interact with them we could create a more meaning user experience solution [22].

2.3 Online Questionnaire

The online questionnaire was used to gather a significant amount of demographic data on a short space of time while also being able to provide users' opinions [33]. For instance, on IDEO, a team conducted a questionnaire to rapidly gather answers around the world on a new gift wrap packaging concept [25].

Thus, the online questionnaire was developed using Google Forms and distributed to a wide array of channels and users. Recruitment started as early as March of 2017 and lasted for two months. Subjects for this experiment were recruited from several Facebook groups such as Unist International Students Association, The Brazilian community of South Korea, Pakistani Community in Ulsan, Korean Government Scholarship Program recipients.

Participants were encouraged to describe and discuss their previous experiences with open end questions and scale their symptoms. For that, we used a Likert Scale point system because this is an excellent tool to measure opinions, attitudes, and beliefs on a quantified system [33], which later could be correlated with the self-perception of mental health, such as anxiety, loneliness, stress, depression, and trust on their self-assessment.

In a nutshell, the primary objective with this online questionnaire was to find if international students in Korea have problems related to stress and depression, their levels of trust, and understand better their context with open-ended questions while already foreshadowing a solution from their insights and perspective towards mental health. Therefore, with a questionnaire, it is possible to elicit answers from a large number of people [25].

2.4 Phenomenal Study - Do it Yourself

With the early responses of the Questionnaire and our interest in technology, we decided to investigate if internet-based technologies can bring benefits towards someone's mental health because we already found evidence that communicating and expressing someone's concern can change the brain [34].

This study is called on the design field as Do it Yourself [25] and it was combined with contextual observation [33] to enhance further the possibilities of both techniques to answer my questions. Not only that, we were also interested if we could create a feeling of trust with the usage of a common channel.

Regarding this study, we were interested in having a first-person interaction and understanding of a message exchanging platform with different users as a pilot test. The pilot test is when we, as designers, apply a solution in its early stages. To understand the effects of its features and benefits can be perceived on the user to enhance later and develop it further. To conclude, we were mainly interested in seeing if people would be willing to listen to others problems and how we could create a mutual helping relationship between people within a messaging interface.

Due to the early stage of the research and time investment, we decided to use Whatsapp messaging application in order to simulate a diary with our users and propose ourselves to them as a someone willing to listen to their problems, while also sharing our struggles. Another important factor here was to see the impact of the culture and language and how much that would need to be present in our final design outcome.

To create this study, we recruited three different people to be our human subjects. Each one of them with specific characteristics: one, a stranger recruited in an online community, two, a person which we interacted with briefly before, third another person who reported a problem on a common Whatsapp group which we explained the idea and decided to do this experiment with us.

All of the messages exchanged are very personal and reflected our moments while providing mutual support to each other. As a role model diary and someone interested on the supporting technology would be able to offer, we tried to portrait ourselves as an intelligent conversational agent and make questions like: “how does that make you feel?”, “why do you think that happens?” and “what are your thoughts and reflections about it?”. In IDEO [25], the design team used medical prototypes to understand patients social, physical and emotional implications related to the proposed design solution.

2.5 Stakeholder Interviews

With the questionnaire responses being all around Korea, we were interested in knowing more from the students in UNIST. For the informal and formal interviews, we approached the students directly. As a current international student at UNIST, we were able to conduct informal interviews with ease.

Interviews are conducted to have a clearer on the spot perspective of users or stakeholders [33]. Besides, they also allow us to have a unique perspective on the problem to be tackled on.

On the IDEO method cards [25], they called this as "extreme user interviews" and claim to have used it on the youngest member of families to unveil new product perspectives. On this paper objective, we were interested in understanding how we could provide a feeling of trust and what are the problems related to stress and depression students in Korea face in order to provide a design based solution for it.

The formal interviews comprised a set of open-end questions with the intention to explore the understanding of the idea and the current solutions UNIST has for international students' mental health. With this approach, we wanted to elucidate the current solutions further and have a better context on the ones which are locally offered.

2.6 Proof of Concept

The proof of concept is a mix of two techniques: quick-and-dirty prototype [25] and the pilot test [33]. On it, we were interested to see if an early version of a design solution could communicate a user benefit from the usage of the proposed design solution. On IDEO [25]), this type of prototype is used for fast communication in between teams and, as later seen on the Design Sprint [27], to quickly test solutions with the usage of a facade.

Aligned with previous data collected with the user studies, we found evidence of conversational interfaces being an area of interest on the field of healthcare [35]. From the boy who asked Siri in marriage [36] to Eliza, a conversational agent concept developed in the '60s, which works as a Rogerian therapist [37]. Therefore, we used a chatbot interface to see if a chatbot service would be able to help international students with their mental health.

For this purpose I used the Munich ChronoType Questionnaire - MCTQ - [38] - a screening for sleeping habits. We were mainly interested to see if a technological solution would be able to provide international students mental health benefit, but we also had a keen eye to see how people would interact with a message exchanging interface.

This process started in June of 2018, and it was changed, due to the Design Sprint results, in July of the same year. This proof of concept was built on Manychat and integrated on Facebook Messenger.

2.7 Design Sprint

The Design Sprint is a five days' workshop developed by Jake Knapp [27] and further modified by the German design agency AJ&Smart [39]. On the first day, people will explore areas of the Sprint theme of interest to identify and discover a problem to tackle.

During the second and third day, the teams will work on developing a solution and a clear direction of outcomes. They will also work on ways to test their outcome. The fourth day is used to create a working prototype, dedicated entirely to create a facade of a working solution for feedback. Finally, the last day this facade is tested with a real user, and its feedback is analyzed by the team to understand if the direction they decided to tackle is worth pursuing, sometimes cutting costs and others accelerating existing possible ideas.

In our case, the Design Sprint was packed into a one day process with a multi-talented team of seven individuals from all over UNIST and different countries. Different from the original Sprint [27], we decided to use the AJ&Smart [39] approach to it. AJ&Smart is a Berlin-based design agency which recruited Jake Knapp, one of the minds behind the Sprint [27] and Google Venture[1], to develop further this method. Since we already had plenty of data regarding the topic of the Sprint, we went directly to the understanding of the data and exploration of early concepts.

2.8 Minimum Viable Product & Temporary Solution

The minimum viable product is a prototype with similar functions as the quick-and-dirty prototype [25], however on the MVP, and in our case the temporary solution, we prototype one solution as a core way to visualize and communicate the results [41]. For that reason, we decided to divide the prototype into two versions: one visual and one functional.

The functional version was an enhanced version of the earlier prototype, distributed on Facebook and still using Manychat as a base. Meanwhile, the visual prototype was made to communicate an idea using a facade [27] in order to gather users' feedback [41]. Therefore, the objectives of this method are twofold:

For the functional prototype, we were interested to see if the mental health of the participants

[1]Various examples of how Design Sprints are influential and contribute to the development of meaningful solutions can be found on the Medium collective Sprint Stories [40]

could be measured and tackled with a design based on the practical usage of it and which mental health problems could be tackled with the design. Meanwhile, for the visual prototype, we were also interested in the usability and if the solution itself was satisfying for the students concerning visual communication while also presenting its three core features: compare and gather data, measure students' mental health over time and provide information of the on-campus facilities.

Since this work is based on the core principles of Human Centered Design, the conceived minimum viable product represents the main ideas from the workshop on a temporary solution. In the end, the workshop solutions were reshaped and adapted towards this masters approach and is one of the possible 46 directions we could take from the workshop alone.

III Main Findings & Results

To further clarify the findings of this research we decided to divide it into 4 distinct categories: Isolation, stress, anxiety and depression, staff perception & limitation, awareness & information, and, trust & anonymity. These categories were constructed from the findings of the research methodologies found in the previous chapter.

Main mental health issues of international students

According to our research over qualitative data with interviews and quantitative data from the questionnaire, we were able to tailor down the major issues related to mental health in South Korea and isolate it into for major ones: Isolation, Depression, Anxiety and Stress. We were able to use a sufficient amount of samples from all over Korea to better understand these problems of international students' mental health. In addition to their perception towards their university staff and programs for international students.

In our questionnaire, responses were composed by sixty-nine people, all international students in South Korea, divided into 34 men and 35 women. From those, 23 people are in between 26 29 years old, and 32 are in between 22 25, composing the majority of the age range of the respondents. From those 69 people, 29 are master's students in South Korea, and 18 are undergraduate students, composing the majority of the data followed by Ph.D. students with ten people. Other categories were also found. Such as master's combined course, language student and post Ph.D. combining into 12 students. Only 9 of the students were in Korea for less than one year while the other 60 have been in Korea for over a year.

For the interviews, we interviewed three different people, one a staff member from UNIST, an international student at UNIST and an international student at Ulsan University. Besides, due to the interest of international students on this theme, we were able to gather information from informal interviews as well. To summarize the objectives of those interviews we created the following table.

3.1 Isolation, Stress, Anxiety & Depression

After narrowing down these 4 mental health-related issues based on observations and literature research, we wanted to better understand the international students' perception towards their

Aim of the stakeholder interviews		
Human Subject	Location	Reason for the interview
Mr. X	International Center at UNIST	Help create a bridge between students and services provided by the university Automatize and facilitate their work effectiveness with a digital design intervention
Student A	Pandorothy at UNIST	Investigate the current support UNIST offers to international students on vulnerable mental health status
Student B	Ulsan University	Investigate other universities support system towards international students mental health

Table 1: Aim of the conducted stakeholder interview

poor mental health status and how that affected their lives. First, we started with quantitative questions and later on, we moved to qualitative ones. The raw data can be seen on the supplementary data [I].

When asked about how often the international students feel stressed or anxious, the majority of respondents described themselves on a level above the normal. Therefore, 41 students, the 59% majority, often has stress and anxiety. Meanwhile, the other 40% represented neutral or no feelings of stress or anxiety at all.

When asked how often the students would feel isolated, the majority of international students in South Korea see themselves on average levels of isolation. According to the following graph, we can see that 27 of the students feel isolated more often than the average, totalizing roughly 40% of the respondent's perception. Only 17 students do not feel isolation at all or feel like they are on the right spot regarding this topic.

As reported above, we could perceive higher tendencies to isolation, anxiety, and stress in between international students. However, when asked about how much the students think they have adapted to South Korea, the vast majority scaled towards fully-adapted, very adapted and adapted. Only 10 out of 69 respondents stated they were not adapted and only one of them as severely adapted.

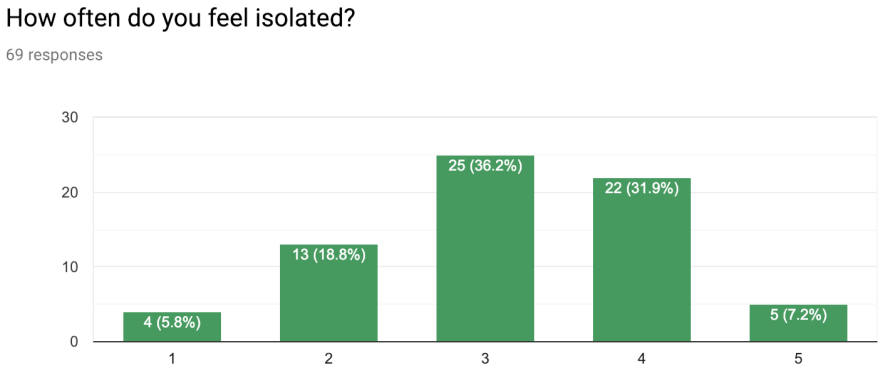

Figure 4: Perception of isolation from the international students at South Korea

With this data, we may see their understanding of isolation and stress as something reasonable in this society and can be correlated with the data previously acknowledged on the previous chapters [17]. Therefore, creating awareness of such mental health issues becomes crucial to treat them on their early stage.

Moving on, we were interested in gathering qualitative data from their health state with the following question: "Try to remember the last time you feel sad or anxious. Can you describe how that affect your academic and personal life?" Since this was an optional question, from the 69 respondents, 46 described how they felt.

"It made me hopeless about my life. I lost focus in studying and hated being with people as no one was willing to help... and lost my scholarships" (online questionnaire, respondent 8). This user seems like he was desperate when this happened. Not only the anxious or sadness made him lose his scholarship, but also made him have negative feelings towards his life and achievements as a whole. Thus, highlighting the need for a service which could help him to get better. His answer shows clear signs of isolation.

"It made me not sleep well. I would wake up before time and always have my head down. I did not want to talk or communicate with others" (online questionnaire, respondent 13). Here, we see the correlation between an inadequate mental health state with sleep. Thus, highlighting the possibility towards a solution which would be able to cover both problems from students and how important are basic actions like good sleep or a routine.

"I didn't want to interact with people. Just wanted to be left alone. Yet resented being lonely" (online questionnaire, respondent 18). These symptoms could be correlated with an anxiety attack. It also shows a lack of empathy towards others which may result in isolation and aggravation of this poor mental health state.

"...I feel super lonely and desperate... I got depressed and because of this, I was sick during one month" (online questionnaire, respondent 16). Another user was clearly stating its sickness due to mental conditions. Besides, it highlights the loneliness and desperation which people in this stage can be found. It also shows the development of a perceived depression which could be further elucidated with screenings for a faster result and diagnose from healthcare professionals.

"About 1-2 years ago, I was surrounded by people who got stress and psychological problem... At that time, I felt a little bit anxious because most of them shared every stress asked advised to me, as in I'm the person they can trust and heal them... If the problem is not that big, it's ok, ... but when they almost doing suicide, that was scared me" (online questionnaire, respondent 29).

From this student, we can see that people are willing to share their issues and seek guidance for those they trust. However, as seen later in this chapter, the staff and university institutions are not sought because they lack this trait on the perception of students. Still, students are not the best prepared to deal with cases where they have no experience or can't be a peer or mentor to others.

This highlights the opportunity for a peer to peer support service as a way to help someone in need. When not finding trust in the university itself, maybe we can provide guidelines to create trust and a peer to peer support program to address these issues while building trust for the institution.

When talking with international students over peer to peer support, we received mixed reviews of that service-system. Most of the students said that their experience with this kind of program in Korea was more related to give the local students grades and volunteering activity than creating a network of support. Although this was recognized as an issue, other students mentioned mentoring and buddy programs as a great experience in Korea and that they were able to become friends and have support from their local Korean mentors.

Important to notice that most of these services have a Korean as a peer who will help the international student and, at least in Korea, we were not able to find a peer to peer support

program where foreigners would be guiding other international students on universities. However, outside of the academia, there are various communities and support groups for foreigners in Korea, mostly based on the nationality of the foreigner or localization.

"During language program I got myself thinking in suicide" (online questionnaire, respondent 44). When someone starts talking about suicide, it is because the thought of it stopped being ridiculous and out of touch. It became real enough. Having a platform or a hotline where people can talk about it and understand the weight of those thoughts and actions, or at least create awareness of it, is something design can do.

Finally, students were asked if they feel like their mental health state in South Korea has changed positively or negatively. A total of 27 students - or 39% of the human subjects - stated themselves as neutral on that aspect, while 11 stated their mental state is better than before and 5 as much better than before arriving at the country. Meanwhile, 19 students pointed a decrease in their mental state and 7 showed a very negative change.

To conclude, we decided to have an interview with an international student, Student A, who took a semester off from UNIST due to a poor mental health condition. The interview was conducted at Pandhoroty, a coffee shop at UNIST Student Union Building, The primary objective of the interview with him was to understand how he coped with those issues and how he used UNIST services to take care of it.

Therefore, elucidating and reinforcing what are the mental health issues an international student experiences in Korea, how were his solutions to deal with it and his perception of the current options in UNIST to deal with this type of mental health issue. Both interviews, from Student A [II] and Student B [III] can be seen on its raw on the supplementary data.

This person complained about how the place was not welcoming at all, and the Korean system towards education and requirements toughness made him take a semester off to recover his mental state after experiencing a very rough semester. He stated that "the need of something to remember people of the world outside of studying," meaning that in his perception UNIST environment is suffocating and it only got better for him after he made friends. Therefore, there is a clear need of connecting people in campus deeper than a superficial level while also providing activities which can bring joy to them.

Another interesting fact is that he stated he would not go to a psychiatrist to treat these problems because of his pride. Still, he noticed that an application like this would be the last

place he would go. However, he understands that this solution would be helpful for a wide array of international students in need. When asked who would use this service, he grinned and said he would do it when he was on his first semester when facing his poor mental health issues.

Once again, we could see a clear gap between provided services and the mental health issues in international students in Korea. As a result, there are different ways that this could be done, creating various opportunities to close this distance between existing solutions and mental health issues from the international students. Still, it seems to our research that the main issue are not the services itself.

Therefore, this creates the opportunity for a better understanding of all the mental health issues services on campus while also providing the opportunity to learn further about why the students are stressed, anxious or depressed. Aligned with it, understanding trust, information from the centers and staff became vital for the research focus.

3.2 Trust & Anonymity

To better understand trust and the role of anonymity in creating it, we decided to do something called Phenomenal Study, or as IDEO cards [25] call it, do it yourself. To see if a messaging platform would allow someone to interact, listen and talk about their mental health. Besides, our goal here was to understand if trust could be created based on a conversational platform and how might we provide trust and mental health support on a digital intervention.

Due to the early stage of the research and time investment, we decided to use Whatsapp messaging application to simulate a diary with our users and propose ourselves to them as someone willing to listen to their problems. While also sharing our struggles for them to listen. With this study, we were able to gather a qualitative understanding of people as we shared a platform and messages of our daily lives seeking for each other's support.

For this study method, three applicants were recruited: an anonymous, acquaintance and a friend. The anonymous applicant opted to drop out of the experiment for undisclosed personal reasons three weeks into the experiment. The remaining two subjects are still undergoing the experiment. The friend has completed one year and a half as our subject while the acquaintance is on his ninth month.

With the anonymous applicant, we were able to chat over his life and make questions towards his decision, trying to provide him further reflection on what he wrote. Example of those

questions, which were also asked to the other subjects was: “how does that make you feel?” and “why do you think you acted that way.”

Due to personal reasons, this experience lasted only three weeks. However, we were able to understand the importance of the anonymity on a to be designed service. Through anonymity, this person was able to share personal data without the risk of us knowing his identity, creating a feeling of trust. Therefore, it highlights the anonymity as meaning to do so.

However, it is important to notice that anonymity worked as an introduction to this process. As we chat and converse more, our intimacy grew. Thus, anonymity is important to close the gap at first, and after the intimacy is starting to build it can be either tackled by the users or let it be.

With the acquaintance, we have a more asynchronous relationship due to her issues. She has anxiety and, as she confessed to us this past month, she had never gone outside somewhere without knowing no one because she was scared of doing something like this alone. Another confession she made, which was much unexpected, she desires to leave her small city and go to Sao Paulo, a massive city in Brazil to pursue her dream and find herself. Until today, we keep this relationship which nurtured with the experiment.

This method highlights the need for the service to be present wherever the user is and feel like they need it. Being mobile is a fundamental concept of the future design solution. It also further elucidate the need of it to be online and fully accessible. It also showcases that each person needs are different, therefore, as a designer, we could provide a more generalist solution which would slightly satisfy everyone or a localized one to enhance one specific user need further.

The friend is someone I developed an even stronger friendship. Our friendship was established with a common interest and later enhanced by this research. In the beginning, we only exchanged texts, and we were able to help him when he decided to change from his hometown to another city. We were also able to provide emotional support when he decided to leave his job due to an abusive relationship his boss carried with him and other local workers.

As our trust started to grow with each other, we started to change the way we would speak and communicate. Soon, we were able to exchange digital media such as photos, audios, and videos. If a solution would aim for trust and anonymity, once again, it should also allow users to be able to break from that concept and become closer due to their own personal understanding of friendship and connection.

When we correlate the data gathered from this experiment with the interview conducted with student A, we can perceive a need for anonymity on a service if dealing with data and creating connections with unknown individuals. Especially when it comes to mental health and private data, anonymity can create the opportunity for someone to open up about its poor mental health state. To conclude, due to the lack of trust on the university staff, being able to hide its own student profile could be of high importance to not suffer any form of an adverse reaction from the institution or its professors.

3.3 Staff Limitation & Perception

Due to our findings, understanding the relationship the students shared with their international supporting center on their institution became relevant to this research in order to understand its perception since it can influence on mental health as a whole. Thus, going back to our questionnaire, the following question was asked: "Try to think about the last time you communicated a problem to your institution Office for International Students, can you recall the problem and how was the institution response?"

To qualify qualitative data into quantitative on this stage of the research, we decided to divide the responses into positive, negative, neutral and did not answered. The result is:

Perception of the international students		
Perception	Amount of responses	Criteria
Positive	13	Answers with positive words, such as good, effective and intention to come back to the responsible staff
Negative	13	Answers with negative words, such as bad, not helpful and intention to not go to the responsible staff
Neutral	14	Answers without a clear intention towards good or bad experiences

Table 2: Quantified perception from the international students over the staff in charge of them

To further clarify these criteria: positive responses show enthusiasm over what was requested and achieved; negative responses have a form of criticism over the service or staff and, somehow,

elucidate failure on the asked task; neutral were those without any indication towards the above criteria.

All the answers may be seen on the supplementary information. However, what it is important to notice here is that roughly two thirds can have a better perception of their international office, therefore, creating an opportunity for a way to better design this experience. Combined with previous information we can see that the lack of trust and bad experiences from students affects the perception of these centers. As a result, negative experiences at those centers influence its perception as a whole.

To tailor this down to UNIST we decided to interview a person in charge of the international students at UNIST. Our interview was conducted at the Unist International Center with Mr. X. The primary objective of this interview was to understand how we could connect and create a bridge between students and services provided by the university to bypass the system structures limitations.

Besides, we were also interested in seeing how they understood trust and provided it to the students. As discovered on the interview, limitations such as of staff and working time were also considered for a more precise understanding of how might we facilitate their work effectiveness with a design solution.

When we design for the staff we should understand that this design intervention should aim at what the university can provide and maintain. If the solution is far from the current reality of the institution, it will become obsolete due to the lack of its use.

The main takeaway from this interview was that there is a lack of personnel to attend all the students' needs and there is a disconnection with the healthcare center at UNIST to provide support towards mental health for international students. Even though the service exists, the lack of awareness of its existence and a low number of available professionals to provide this service in English are a problem for international students.

Combined with it, students may be misguided from one center to the other due to English not being the primary language in both ends, students and staff personnel in both centers. Therefore, this situation affects the trust and makes the student lost in translation, not knowing where to go for its problems. Therefore, combine there is a need for understanding mental health, staff limitations and perceptions together with the provided information and awareness from these places.

3.4 Awareness & Information

At the UNIST campus, we were able to conduct informal interviews towards our topic and direction on a daily basis, receiving approval from many and volunteering for the future MVP when launched. Thus, it reflected the need for such a service on campus for international students. It is important to notice that when we describe this research aim and goal, Korean students' responses towards the responsible centers on mental health usually are positive. This reaction elucidates that there are a gap and the need for a tailor fit service for the international students at UNIST.

Besides, the current solutions at UNIST seem to not be fully acknowledged by the students. As demonstrated by our interview with Student A. He was surprised by the fact that UNIST offers mental health support and counseling as he was unaware of the existence of a healthcare center on campus. He is a senior and has been at UNIST for more than three years.

Another interview, with Student B from Ulsan University, was also conducted to understand other universities solutions in loco. This person had various issues with the university administration and lack of support from their international center. When conducting this interview, in less than 1 hour, it became clear to us how this person needed a professional mental health care provider to support her mental condition. Still, by her explanation, her university was acknowledging the situation and ignoring it. This experience was by far the most laborious process which we have participated in and conducted.

This person had the traits of suicidal thoughts and was talking about how her life would lose sense if an event happened. This person also pointed out how she went to the international office in her own and found nothing but closed doors to her claims, complaining the university staff was ignoring her. This reported attitude highlights the needs of such services as a resource for people in need while also providing their responsible international staffs with data hard to ignore in seeking for help, generating evidence for the international students to use as a backup factor.

Based on the found needs related to information and awareness, we decided to iterate an automation agent to provide screenings and centralize information from within the university. This process started in June of 2018, and it was changed, due to the Sprint results which will be showcased later on, in July of the same year. We had five users which we asked to participate in the experiment and other Facebook users joined the experiment voluntarily.

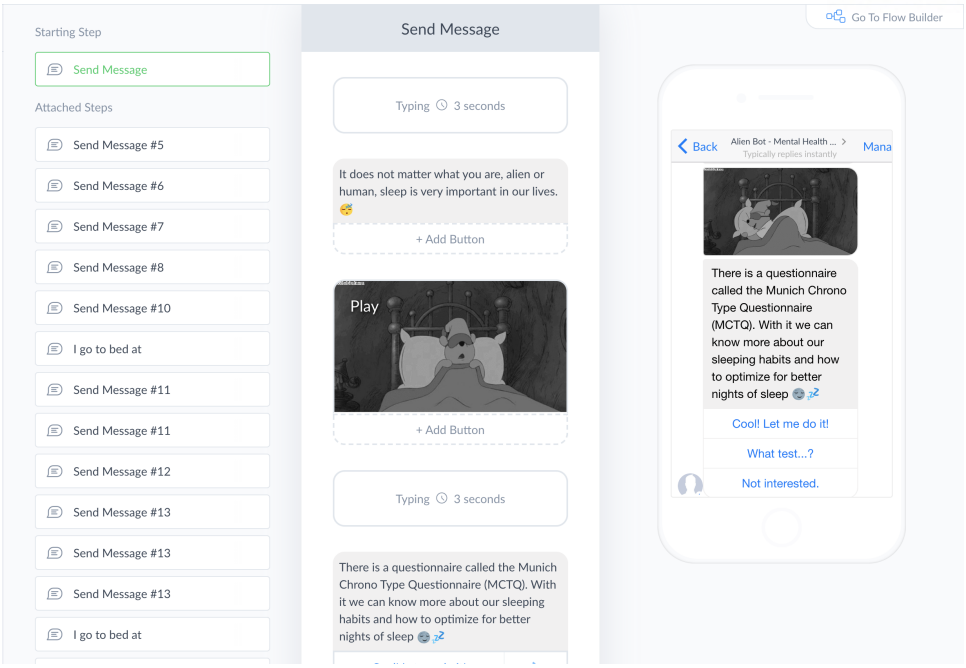

Figure 5: Quick and dirty prototype with the dialog flow

According to the users, when asking in person, the solution was not engaging. The main reason why was the content itself. They felt like it was not related to the campus and mental health in UNIST. The communication of it was also seen as not appropriate, creating a distance towards a trustful healthcare application. Therefore, we can see that a healthcare solution in campus, even though it may have a different communication because of its users, should maintain some seriousness because of its content topic to generate and gather trust.

This quick-and-dirty prototype, as called by the Ideo Method Cards [25], was a chatbot and exposed various routes for this thesis and showed the importance of iterating early stage concepts. As a result, one of the most significant implications from the users was the content. The conversation flow was perceived as more generic than specific towards international students' mental health screenings.

Even though the content was the downside of this experiment, we were able to discover that people would use a service on Facebook and trust it provided that the content fits the user needs. Therefore, we could bypass the trust issues on the center itself with an automated agent.

However, UNIST students did not perceive what the service was and felt like its connection with international students mental health was lackluster with its current conversation flows and screenings. To address it, we decided to rethink the thesis content and provide guidelines to work with mental health with a workshop called Design Sprint [27]. With the participation of

UNIST students to contribute to the service localization and connection with the local international students, we were open to explore possible solutions and generate guidelines which can influence and help towards the development of future digital solutions towards mental health of international students.

IV Guidelines for Mental Health Support

Based on the iterations conducted on empirical studies we were able to tailor down the needs of international students to four different topics: awareness, trust, centralization, and distribution of information. To further conduct our studies and bring closer results to the reality within the design field we decided to conduct the next stage of our research on a workshop called Design Sprint. Our main objective with this workshop is to provide guidelines towards designing for mental health, targeting specifically at UNIST.

All the 6 participants of the sprint were UNIST international students, from undergraduate to Ph.D. Candidates interested in the topic of mental health. From within these students, two are diagnosed with mental health conditions and take medicine for it, bipolar disorder and depression, meanwhile a third self-diagnoses as bipolar. The results of the research thus far were shared with the students. On the workshop, we could identify critical problems in UNIST regarding mental health and international students struggles' in general.

Figure 6: Participants of the Sprint on the workshop.

They were recruited through U-Survey, a UNIST focused group to answer questionnaires and other research methods from within the university universe. The students decided to remain anonymous due to the nature of the study. The Design Sprint was conducted during August of 2018, and it lasted half a day. The participants were paid $20 at the end of the procedure and signed a consent form for their identities and data to be protected.

4.1 How might we map mental health?

To work further on the findings from the previous chapter, we gathered for a full morning and created questions using the same suffix: "how might we?" as we discussed the findings and relate them to our participants' lives. Participants were encouraged to keep discussing to generate as much "how might we?" questions as possible. Later on, we provided the workshop members with three different personas who represent the respondents of the previous research methods.

With each persona, one at a time, we created scenarios and mapped their behavior. As a result, we divided the content into different categories, always with the "how might we?" questions as supplementary to it. Therefore, we were able to map issues related to stakeholders, the perception in general and towards the actions to be taken. The only different table is the data gathering table, which directs the how might we questions to a more techno-centric resolve and was generated on the workshop by the participants.

After placing the questions within the persona map of behavior, we were able to visualize and understand better the sections which may affect the most international students' mental health. Therefore, we were able to vote towards the ones which we think the design could create an impact on with a meaningful solution. For the purpose of this paper, we decided to bring here only the "How might we?" questions which had at least one vote by one of the design sprint participants. The full tables and personas, with all the proposed questions and personas, can be seen on the supplementary data [IV].

To differentiate the tables and results, we provided three different personas. Each persona had a specific problem that was supposed to be addressed and explored from the "how might we" approach. The mapping consisted mostly of actions and stakeholders interactions.

Edgar Vivi

The first presented persona was Edgar Vivi. This persona main goal was to find help in UNIST to by correlating it to his poor mental health state. Taking a look at Edgar Vivi and its "How might we?" questions we were able to formulate the following table

One precious moment of this heat map and questions construction was when one student decided to become the leading advocate for this predicted scenario. Such a situation happened because he said he was not in a good mental state, with similar reasons and motivations to the

Generated "How might we?" questions for Edgar Vivi					
Generated questions with at least 1 vote					
Reduce judgments	3	Trust issues	2	Feel less isolated	1
Same exp students (peers)	1	Know who to talk	1	Better Advising	3
Better advisor interaction	3	Interest of personal advisor	1	More events for int. students	2
Better communication from Health Care Center	2	reduce harmful issues	1		

Table 3: How might we questions generated during the Design Sprint for a person in need of mental health help

proposed persona, which culminated into him losing his scholarship.

According to this table, we can perceive the need for better communication between the students and the professionals in the university. Also, we may predict that the solutions from the students will be connected with a form of creating stronger bonding between university staff and international students with the use of services. Another exciting aspect of this table and votes is how much importance the participants of the sprint gave to a better advising and mentoring system and service from the university.

Rick Vici

The second presented persona was Rick Vici. This persona main goal was to find help for a friend in UNIST without relying on the staff due to the lack of trust. The generated “How might we?” questions with at least one vote for him can be found on the following table.

Our sprint team understood the role of someone helping his or her friends towards a better mental state. However, they did not feel related to this persona at all, raising numerous questions about why he should be included in providing better mental healthcare services or solutions. Therefore, this set of questions became indifferent for the participants who identified themselves

Generated "How might we?" questions for Rick Vici					
Generated questions with at least 1 vote					
Mostly services are in Korean	1	Open up & Share problems	1	Informational sharing	1
Lack of information	1	Take out from isolation	1	Reduce in lab language issues	1

Table 4: How might we questions generated during the Design Sprint for a person aiming to help a friend suffering from poor mental health

more with the other two proposed personas.

Lola Vini

The third and last presented persona was Lola Vini. This persona is different from the other two. The main reason why is because this user is someone curious towards mental health and wants to understand it further. Although this person is not looking for solutions to its own state, participants identified on her the need for mental health support interventions due to her characteristics. The generated “How might we?” questions with votes for her can be found on the following table.

Generated "How might we?" questions for Lola Vini					/
Generated questions with at least 1 vote					
Open ourselves over our problems	3	Crash course into her own problems / informational therapy	2	Self problems first	1
Share anonymous info / issues	1	Deal better with scholarship issues	1		

Table 5: How might we questions generated during the Design Sprint for a person curious towards mental health

Although all the personas and scenarios were generated from previous data, the sprint participants raised questions towards a curious person and its interest with mental health. Therefore, they stated that this persona, considered curious at first, is actually in need of help as well but in a different manner if compared to the other tables and proposed scenarios on this workshop. They also understood this persona as someone vulnerable but afraid to admit and seek help. Interesting to note, in our previous questionnaire we had a wide array of users who identified themselves in a similar situation.

The fourth persona: data gathering

The fourth persona was actually created on the Sprint. However, in this case, this was tailor made from the participants as they understood the role of data gathering important for mental health interventions and maintenance.

Generated "How might we?" questions for the scenario of data gathering				/
Generated questions with at least 1 vote				
Use data gathering	1	Generate knowledge	open	1

Table 6: How might we questions generated during the Design Sprint towards the use of data

This situation was perceived as necessary by the students and added on the design sprint for the heatmaps. On its questions, we can see that there is an opportunity to address some of the international students' needs using data and intelligent solutions. Thus, this sparked on them how they could use data on a possible solution and guidelines.

4.2 Design Sprint results

The last step from the Design Sprint was to visualize the map and create solutions and guidelines based on copy and volume rather than quantity on a sheet of A4. This process is called the Crazy Eight. At first, we divide the paper into eight squares. Later on, each of us has one 1 minute to design a guideline. Some examples of the outcomes can be seen on the following images and all of them may be seen on the supplementary data [V].

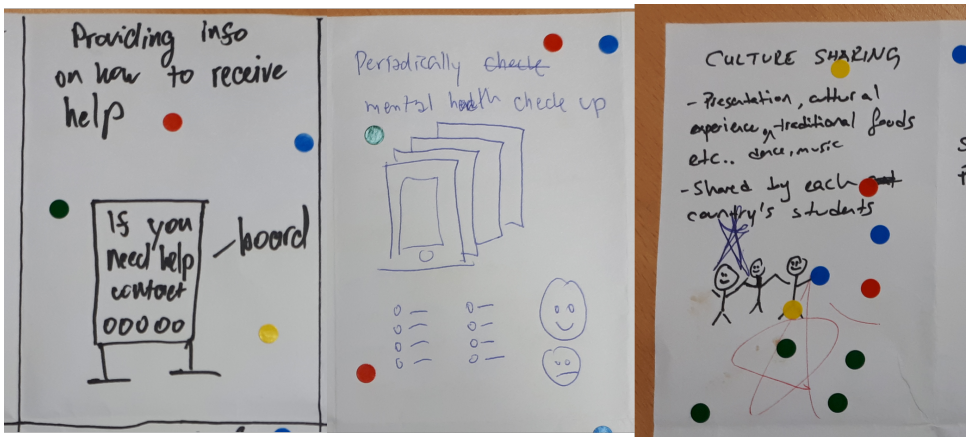

Figure 7: First set of examples from the Crazy 8 developed by the students.

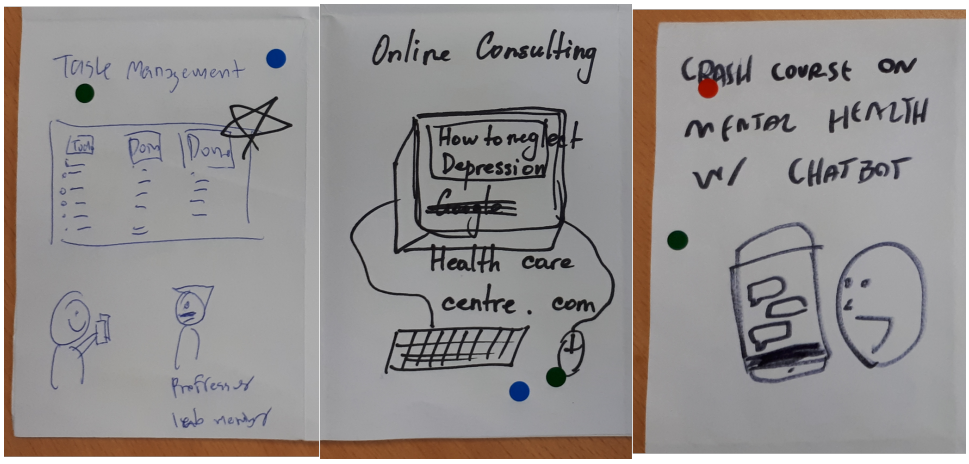

Figure 8: Second set of examples from the Crazy 8 developed by the students.

After the process is finished, we present to each other and vote the ones which we believe to be more relevant and essential regarding the content of the sprint and the international students' needs. Some students added a star to those they thought would be more necessary and, if implemented, they would benefit the most. While presenting, we also look for opportunities to merge solutions and guidelines in order to create more meaningful solutions.

It is important to state that some of the most voted solutions were very simple, like taking regular trips outside of unist or having an international student working for these staff. Thus, highlighting how under perceived the services at UNIST are for international students if compared to the Korean students.

The result from this process consists of 46 propositions of international students to tackle problems identified with the help of the previous maps. Due to their similarity, some of the solutions have been combined. The solutions can be seen on the following tables within its own

grouping and may repeat if they fit in more than one category.

Making friends and strengthening social fabric		
Crazy 8 Solution or Idea	Votes	Stars
(r) Culture sharing	10	1
Lonely club	5	
International student in community center for international students	5	
More events gatherings	5	2
Buddy system	4	2
Activities for socializing (Chess, any games)	4	2
Mentor-Bro	3	2
Ice breaking activities	3	
Bonding	2	1
Friendship	2	
Community	1	
Gathering place for no judgment meetings	1	
Friend	1	

Table 7: Social Fabric Strengthening: guidelines and solutions from the Design Sprint

Strengthening the social fabric is a good solution towards the issue of trust found on the Korean universities and at UNIST. Therefore, this type of solution may contribute to a better community building and living for international students. Besides, creating a better connection and bonding between students under staff regulated activities may also enhance students' willingness to trust the institution's programs making its perception better.

Even though these contributions aim to better wellbeing from its users, such solutions don't target directly mental health issues. They also don't contribute directly to the awareness of mental health issues on campus and services related to it. Therefore, although those solutions were perceived important, they don't tackle two of the major needs we found in our user studies. They end up being more of a guideline than a solution itself.

Issues related to advisors and supporting solutions, such as peer-to-peer and mentoring are based on trust and connection. As shown on our previous studies, this can be created over time first with anonymity and later on with a more direct connection, according to user's preference.

Advisor, advising and supporting related solutions		
Crazy 8 Solution or Idea	Votes	Stars
(r) Buddy system	4	2
Mentor-Bro	3	2
Mentor conferences	3	1
P2P trusted social networking	3	
F.A.Q. for international students	3	
Friendship	2	
Online consulting	2	
Advisor meeting	1	1
Friend	1	
Deal with peers ignorance	1	
Guide and information for specific staff	1	
Helping facilities		

Table 8: Advisor and supporting related solutions: guidelines and solutions from the Design Sprint

Still, such solutions, if not done by the staff and centers in charge, will not contribute to a better perception of such facilities and will not raise awareness of mental health issues unless they are at the center of implementation of such systems.

Combining this with the fact that the current institutions on UNIST lack human power to offer such a service, it becomes an unreal solution to be developed further on this master thesis work. Besides, they do not target directly mental health status, which is a focus of this paper.

Even though this was not in between the most voted categories, the information provided, and guidance with digital interventions tackle all the previously discussed findings. Due to the nature of digital systems, we can turn systems first into anonymous and left it open to its own users to disclose their personal data further or not, generating a feeling of trust and possible disconnection if anything goes wrong on the usage of such services.

Aligned with it, the information therapy and perceived benefits of data gathering with online consultancy may generate an understanding of the student mental health status, being this category one where the clear benefit of mental health may be found. Aligned with it, it this is a

Information providing and guidance with digital interventions		
Crazy 8 Solution or Idea	Votes	Stars
(r) Providing information on how to receive help	4	
Periodically mental health checkup	4	
Automated agent helps you to get good sleep	3	
Access to information	3	
F.A.Q. for international students	3	
Task management	2	1
Point of contact	2	
Crash course on mental health with a chatbot	2	
Easy steps with information therapy	2	
Online consulting	2	
Data crawler as a diary	1	1
Anonymous collected life data	1	1
Self-study	1	
Guide and information for specific staff	1	
Anonymous chat room to discuss mental issues		
Online consulting with a doctor		
Online expert talk therapy		

Table 9: Information providing and guidance with digital interventions: guidelines and solutions from the Design Sprint

university-provided solution and work well without the need of staff to maintain its usage, it can help to create a better image of the university whilst also providing a point of contact between the student and the centers related to mental health and its own personal affairs at UNIST.

Since digital interventions can use data to further tailor down the user and its needs with data gathering, this type of solution end up being able to tailor fit students needs' with information while also providing awareness of such issues in the possible form of nudges or other design interventions.

As shown in our research, the improvement of the quality of life is needed by international students. However, this seems to be a set of solutions based on adoption and trust, something

Improvement of quality of life - gatherings and daily routine		
Crazy 8 Solution or Idea	Votes	Stars
(r)Exercises	5	
Relaxing travelling and activities	5	
Volunteer activity in campus	4	1
Periodically mental health checkup	4	
Joining a club	4	
Study path	3	
Volunteering	3	
Regular visits to a doctor	1	
Trained to be a good listener	1	
Anonymous international student chat community		

Table 10: Improvements of quality of life - gatherings and daily routine: guidelines and solutions from the Design Sprint

which UNIST is still striving to get from its international students. One example of that is that some of those solutions can be found on English Commons, a center for learning English at UNIST.

To conclude, some of these solutions already exist but are not being adopted by international students due to the perception they have of these events. This shows a clear lack of fulfillment of their needs from such events.

However, it is still important to consider some of its activities, like traveling and exercises, as holders of potential huge benefit of mental health for the students and should be further encouraged at the university facilities. There are independent events at UNIST which tackle with these issues, for instance, the Indian Games - a sports event held during Chuseok by the Indian Community at UNIST and open to the whole international community - and the Beauty Jam - a group of women lead by one of the participants of our workshop which aims to help women at UNIST with makeup, hair and other girl related products and activities.

As shown in our mapping and solutions, there are various solutions which could be designed and pushed on further. However, due to time limitations and aim of this master thesis, we decided to focus on one temporary solution from within one category which was able to tackle

most of the findings from our user studies.

4.3 Temporary solution: Chatbot

Analyzing the previous solutions under the category of Information providing and guidance with digital interventions and how they may benefit all the findings found on our research it was clear that this was the path our research should follow. To group and provide a temporary solution on this field we decided to create a chatbot.

A chatbot is a software aimed to automatize and scale one-to-one conversations using technology [42]. Automation of services is already a reality on the industry with companies developing its own intelligent operational systems such as Siri from Apple, Alexa from Amazon, Google Home from Google, Watson from IBM, Leonardo from SAP and others. Even though it exists a high demand and companies tackling the automation of services with conversational agents, there is still room for improvement of the technology. However, in this work we will not focus on the technical aspects, instead, we will provide further reasoning for it as a possible and temporary solution for the international students' mental health issues at UNIST, providing reasons why this would be a good solution on this target user and localization.

In this field, one of the most voted solutions was related to providing information and being of a point of contact. Currently, UNIST center in charge of the international students does most of their publications on Facebook. During two years of studying at UNIST, we have not received more than one email from the international center. Thus, this showcases where they share and provide their information. However, due to the nature of the social media, this environment can become chaotic and does not represent UNIST as an institution, since it is on a third party platform, creating an opportunity for a service which will not exclude the Facebook posting but enhance it.

Besides, the contact from the international center is quite unorganized since each staff has one direct function and will guide the students only to the person in charge of it, not taking responsibility if what is being asked is outside of their own reach. Therefore, guiding for the specific staff and creating a better point of contact can be achieved with a digital solution. Aligned with it, due to the misguidance which happens on this and the health care center towards mental health-related issues can be covered with information on how to receive help.

To add on to this solution, online consulting with an automated agent and positive cognitive

therapy can be done on a chatbot as it is already done around the world in different applications, such as Eurekka [43], Woebot [44], and Poketcoach [45]. They all focus on the use of cognitive behavior therapy towards symptoms of depression and anxiety.

Different from those bots, our aim is to provide a more localized experience towards the students and to use gathered data with already trusted and widely used screenings as a medium for students to do a mental health self-check. This way, students with high pride and who want to remain anonymous will still be able to check their data in relation to others without the need to expose themselves.

As a result, we may use the data provided combined with crawlers as a way to collect anonymous information of the user's life data. Later on, when a sufficient amount of students in different categories can provide a medium of their mental health, it also allows students to do a self-check-in of their current status with the comparison as a base for it. This information may also be used further to provide professional healthcare providers a faster diagnose and understanding of that student mental health since a mental related problem is harder to diagnose than a physical problem.

To conclude, we may use the chatbot as a source of information for the students at UNIST. The current lack of a center of information is an issue not only perceived by international students but also by the Korean students.

4.4 Temporary solution: our MVP, Alienbot

As mentioned before in the methods, our current temporary solution translated into the Minimum Viable Product - MVP - was divided into two types of prototypes: functional prototype and a visual prototype. Both were originated from the concepts and guidelines provided during the Design Sprint and further adapted as we progressed this master thesis.

Functional prototype

For this prototype, the identified MVP was an automated agent that was revamped utilizing three different questionnaires as screening tools. The screening questions were adapted into a chatbot system and modified for testing. The answers were changed to a 3 point system which could be calculated manually. The prototype was constructed based on three questionnaires Mood Disorder Questionnaire [46], DASS-21 [47] and Self-discipline questionnaire [48].

In total, there have been 103 unique users on the platform and 146 interactions with the functional prototype. Most of these users have been acquired on the second iteration of the chatbot, which started on September 11th of 2018 and was closed November 25th of 2018. The high amount of interactions with this prototype was an exciting number, even more, when all of its users came from organic search. Therefore, pinpointing the need of such a service.

Regarding the screenings, from the 87 users, 54 went through to discover their depression state. The following test of Anxiety was completed by 49 of 52 users which applied for it and stress by 43 out of 49 users. This result has a completion rate - a total of 49% -, important to mention, 62% of the users completed the full questionnaire regarding their depression state.

From all of the 103 users, only nine were interested enough in their self-control to take this assessment and from those 9 8 went until the end. The other screening towards mood disorder questionnaire - bipolarity - was clicked by 13 users and completed by 9.

From the functional prototype we can see that 87 people have a higher interest in topics like depression, stress and anxiety, thus, our solution should be more related to mental health instead of diagnosed issues, like bipolar disorder. As a result, when moving on to create the visual prototype, our focus was to have a better understanding of depression, anxiety, and stress as its core value. Still, since software can be enhanced based on use and iteration [23], I decided to keep the other two screenings on it for more explicit communication of features from the designed solution.

Important to notice, due to this subject, the chatbot received messages containing suicidal, depressive and anxious content. The current technology allows users to express what they are feeling, however, it still does not allow a full understanding of how a machine and technology may interact with him or her.

Visual prototype

The visual prototype was conceived using the software Sketch and Figma. To better communicate the purpose of this design solution, we decided to create a visual identity for it starting by the name: Alienbot.

The name of it is Alienbot because foreigners in Korea are called aliens, and we carry a document called Alien Card to show our visa status as international residents of Korea. Thus, this naming made sense with it. Together with the naming, the green color became a common

place to go because it represents health and also is the alien color in various science fiction movies and books. The blue tone as a secondary color, in conjunction with the black and white, added the feeling of a document to it while also bringing UNIST blue resemblance to it.

The developed logo and visual communication embrace the alien perception combined with a chatting symbol. Due to its strategic position, it also creates the feeling of a stamp on a passport or other document, like the identity of the chatbot itself. Together with it, the font in capitals and clear kerning provide a visual that resembles a document.

Figure 9: Alienbot logo for a visual image of the application.

With the establishment of the concept, we were able to provide a visual prototype of what this solution should look like and which features it should have in its usage. We decided to highlight the three main functions of it as:

Mental Health Screenings

The screenings are of high importance on this process due to their possibility of elucidating a mental health status. Together with it, this is one of the first applications which attempts to adapt mental health screenings to a chatbot context.

In Campus support

This section seems vital for the project regarding localization. With it, we want to highlight the services towards mental health on UNIST campus and create awareness of it. Due to the low levels of trust perceived in our questionnaire answers, we wanted to create an opportunity for people to understand what these centers do. Besides, we want to provide this opportunity at whatever time they feel more comfortable to do so.

Data Comparison

With the technical support, we can gather data and provide to the user a map of his emotional state based on his screening response. The data can be further applied to other data sets to help the user to compare his mental screening results with others, generating a further understanding of his state.

These solutions can be seen on the onboarding stage of the high fidelity prototype, making it the welcoming screen of the users.

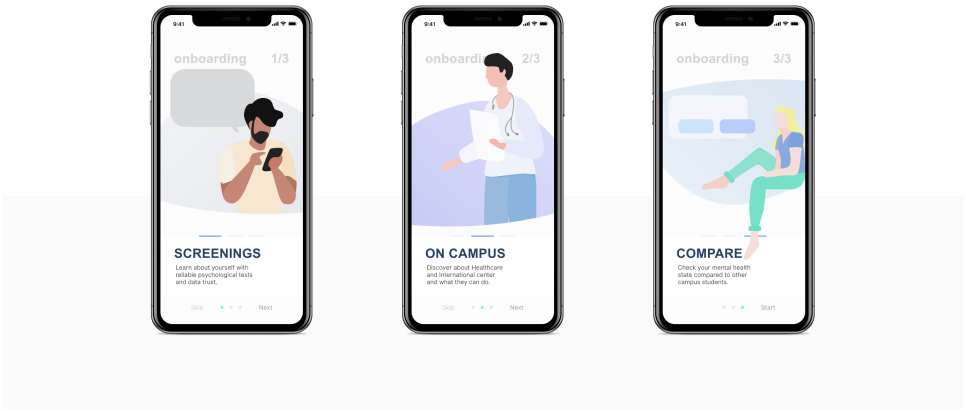

Figure 10: The 3 onboarding steps on Alienbot.

The main interface of the chatbot is focused on chatting with menu options for their profile and data management and another one for a UNIST number directory. The former one provides self-understanding over the data provided with the chatting screenings while the last allows a glance towards services on UNIST. On the services on campus, it focuses on the mental health from the health care services and on the international services from the international center to create a contact point. On the ones outside the campus, it covers topics like suicide, with a suicidal hotline, and documents affairs with the point of contact for the immigration office.

The clean visual of the interface and significant typographic elements are a common trend on design. They allow easier visualization of elements and are also more commonly found because the users are familiar with such structured design on other applications. Making it easier to utilize. Considering people in a vulnerable situation would not want to learn how to interact with a new interface, this detail was considered significant.

When going to their profile to view their data, users are allowed to check their past answers

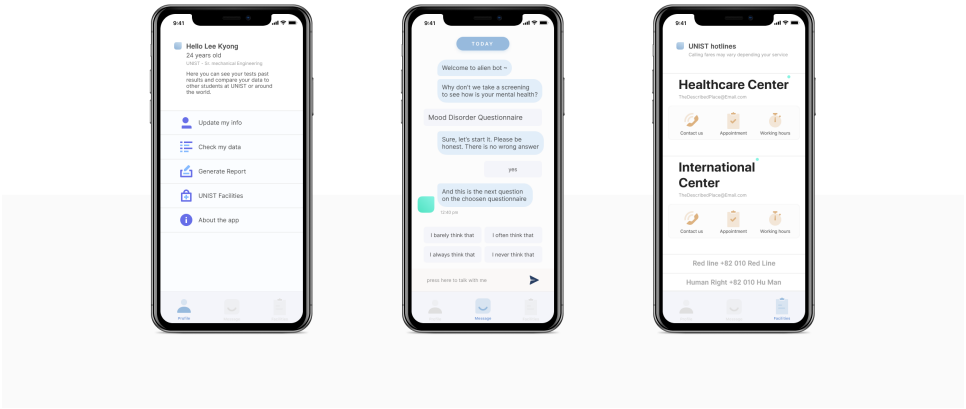

Figure 11: Core features from the application.

towards the screenings and see the changes of their scores through frames of time. There, they could also compare their test results with other people on their major, grade and other filters, thus generating a reference point towards their mental health. They would be able to compare their data with others, based on a medium, this way not showcasing anyone's specific data and keeping the user protected to provide its own.

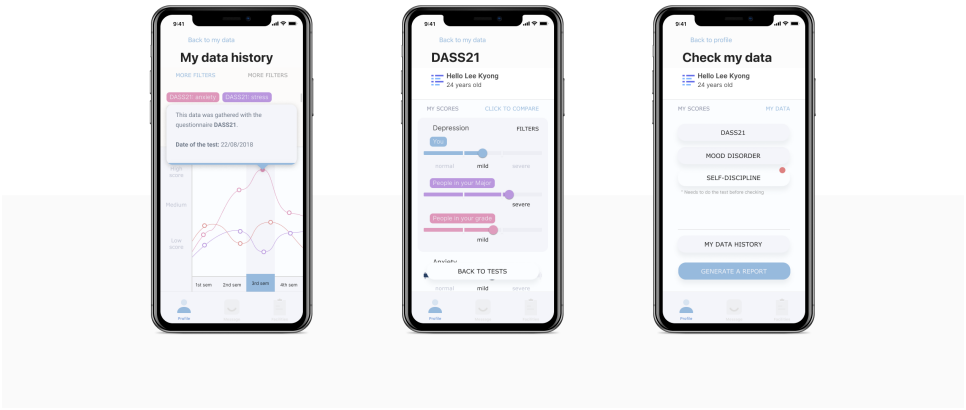

Figure 12: Checking data with Alienbot.

As a remark, the primary objective of this hi-fi prototype was to represent visually how the chatbot would integrate and act while also showcasing its significant functions. The full prototype can be seen online. [2]

Other solutions by the students on the Design Sprint had the potential to be developed. For

[2]The prototype was first developed on Sketch and later enhanced on Figma. Links for it can be found on the supplementary data[VII].

instance, from the Sprint I was able to synthesize the user needs into something called Playbook. A playbook, as seen on the Cambridge dictionary [49] is "a set of rules or suggestions that are considered to be suitable for a particular activity, industry, or job" and one example of it can be seen on the IDEO Method Cards [25].

However, in our case the solution would focus solely on UNIST students while providing them the opportunity to collaborate, making this solution a collaborative digital playbook towards living in UNIST. In the end, the Design Sprint contributed to elucidate various solutions from the students themselves with their own perceived benefit. Thus it allows this research to highlight guidelines towards designing for mental health for international students.

V Discussion

Our user-centered methodologies provided a rich description and detail of the international students' perception towards mental health. It allowed us to understand that there is not a centralized place towards mental health and university services due to the decentralization of information. The described issues become a problem because according to the online questionnaire there is a continuous decrease of overall mental health for students in Korea while the subject of mental health itself is also an issue in the country [50].

According to our research, stress and depression were perceived as the most prevalent mental related problems for the students in South Korea. Therefore, a technological solution with the objective of addressing these two preventable conditions was much needed. To provide a clear answer to the improvement of this condition, it seemed necessary to use data collection and comparison. This way, international students could compare their data to others and better pinpoint their mental health using comparison as a base.

Later on, our provided prototypes tried to understand even more the role technology can play in providing mental health support for international students by providing them with screenings, comparison of data and in campus information. The asynchronous need of being able to access the agent seemed like an advantage for the students, and the ability to generate insights on their data could support their understanding of their mental health while also providing healthcare professionals with meaningful data for when a meeting would be necessary.

Moving on, when localizing this research to UNIST, our findings confirmed that there is a gap between the services provided by the UNIST and the students. The gap exists, and it is acknowledged by UNIST. However, international students are not being included in the process of closing this gap. Our research showcases the potential international students can employ in providing meaningful solutions towards these services and themselves with user-centered design methods and techniques.

Another finding in our research was that international students and Korean students have a different perception of the healthcare center at UNIST. Therefore, we can see that the services the center provides are not the problem; instead, the perception of it is. One of the ways to work around that is to provide automation of the service as supporting software. With it, international students would be able to use partially the services form the center and, using data, better understand themselves and where they fit in comparison to others on their own.

Therefore, this thesis work elucidated the apparent need for mental health services for international students at UNIST. It highlights the need for awareness and also showcases the lacking bridges between international students and those services while also showcasing the need for integrated solutions from the university center.

5.1 International Students and Mental Health

As seen by previous research, international students have various problems which can reflect on their mental health due to the various challenges in a new environment and lost identity [16] may put them on a more vulnerable situation [17]. On this research, we explored how the relationship students had with their institutions and mental health was correlated. In our findings, we could also perceive a low level of trust towards their institutions, which may collaborate with a more vulnerable perception of themselves.

Therefore, having similar standards between local and international students could be misleading towards the quality of the university services on mental health. Rather than providing a unique system for all of its students, the university should put more effort on the mental health of the international students separately — for instance, unique events for international students which target their wellbeing instead of only extracurricular activities.

This issue could be correlated to the lack of English material and international friendly events on the university. The lack of those services and wrong perception of the ones that exist generate a feeling of lack of trust. As a result, as shown by the online questionnaire, interviews and later on the sprint there are grassroots movements between student's communities, but they are exclusive instead of inclusive.

The benefits perceived on grassroots movements was that these places talk about problems international students have as a form to prevent them. Meanwhile, in our research, we saw that the Korean institutions only work on problems when they appear, as a way to fix them instead of also act on preventing them. This behavior became even more evident when one of the students on the Design Sprint open up to us how he lost his scholarship and how that became an issue for the university only when it happened.

Therefore, we could understand that the university students' problems could be tackled before they happen and that the stress, depression, and anxiety, which are already on the university environment, are enhanced by this only prevention method. As a result, we can

perceive that a prevention method, correlated with the university but not dependent on its staff or human limitations, could help the students to cope with poor mental health.

For a better understanding of students' mental health and with the intention to provide prevention methods, this research applied an automated agent with screenings to provide students data and understanding of themselves while also making available information of the campus existing services. Our decision towards it was based on the fact that an automated agent can portray the role of an assistant and early prevention tool instead of a final solution or replacement for mental health services.

However, it is important to notice that this is not the only solution on what design can do for the international students' mental health. By the Design Sprint result alone, we have more than 40 solutions which can be further developed, combined or enhanced and may provide better mental health. In the end, our research provided design tools to empower the international students towards providing meaningful design solutions for their mental health on the university campus with a clear target and aim due to the presence of the professional designer.

5.2 Conclusion

The goal of this study was to understand see where design, technology, and mental health care intersect to create meaningful design solutions using user-centered methods. Due to the nature of the research, its outcomes consists of analyzing data and understanding it as a driven force for future innovations on the design field. The empowerment of the user as a catalyst for the solutions towards mental health provided meaningful insights and point of views towards the design implications and needs.

As a result, we hope this thesis contributes to the design field as an ignition spark towards the creation of user-centric solutions towards international students while also highlighting unseen needs because of the lack of studies on the area. Besides, this research was conducted by another international student, allowing for a higher degree of perceived empathy on the process, another characteristic much needed in times of artificial intelligence and big data protagonism.

We hope that the highlighted needs of those services may bring other solutions towards this topic. Besides, the other solutions provided on the Design Sprint could be further used for UNIST, or other universities in Korea. As a resource of solutions to develop upon and try it out on campus. Important to notice that other chatbot applications have been made in UNIST,

but none with this focus on international students and towards mental health in a user-centric manner. This understanding is essential because if the mental support can be provided on the early stage, an automation agent may contribute towards the international students well being.

Our results show that international students do not perceive the current solutions as satisfactory and are willing to work towards the improvement of them by actively participating in workshops and other methodologies for their benefit. In addition to that, we found that the university centers have limitations towards what they can do concerning human personal. Instead of seeing this as a limitation, in our work I tried to understand that as an opportunity for technology to act as a bridge and close the gap between students and staff.

This set up allowed us to work with students as a central part of the solution to find a meaningful design interview to fill this gap while also tackling issues based on trust. The scope of research was mostly on mental health. Therefore, physical problems and other issues related to documentation were not covered in this study.

Also, our work was conducted only in Korea and later on localized further on UNIST. Therefore, the results could differ if applied to a different institution or country leading the space for further studies to come in and further improve international students' mental health with technological interventions. Therefore, further studies should tackle and work together on a more global and local understanding of mental health for international students in order to provide even more meaningful solutions.

Another critical issue shown in this research is the lack of awareness of mental health issues. Raising awareness towards mental health is still of vital importance, not only in UNIST but globally.

We found plenty of studies on universities about mental health and few with international students on focus. However, most of them had the clinicians or the researcher point of view towards a solution or exploration. The international students were perceived more as human subjects than co-creators of their solutions. Thus, the human-centered design highlights the need of including the user on the center of the development of solutions as a way to create meaningful solutions.

Therefore, future work considering a user-centric approach is much needed to disclosure the needs of international students in other parts of the world. Thus, creating an understanding of what is mutually needed and what situations and issues are present in our surroundings.

VI Ethical and self-considerations

Ethics are acknowledged as a "method, procedure, or perspective for deciding how to act and for analyzing complex problems and issues" [51]. Therefore, they become embedded in the process as a code of conduct. We decided to organize it into topics what was considered to have the potential to be sensitive or require extra attention to the field of technology and mental health.

Privacy and Security

All the data used and gathered on this research that can be attached to a person should remain private. Participants of the workshops and other methods were aware of this right.

Human subjects and Anonymity

Dealing with someone's mental health using a facade of artificial intelligence can result in the exposition of unwanted fears and pain points to the researcher with access to that data. Due to the lack of disclosure of what is fully automated and what is not with users which came organically to the design solution, we will adequately protect their names and keep their information confidential.

Data consent and Software legal terms

Nowadays it is widespread to be obligated to accept navigation cookies when browsing online content. With a simple "I accept" confirmation on different websites we allow data crawlers to dig our personal information and construct a faceless panorama of ourselves online [52]. With the usage of third-party software to construct our prototype, it is inevitable that our users had to abide by those services rules and agreement over data.

This study is designed to develop solutions towards mental health, a sensitive topic by itself. Furthermore, we cannot obligate someone to describe their mental health status and need to rely on the self-report from others on these conditions. As the data is obtained, deception of any form or the masking of critical information may result in less accurate results and will only prejudice the end user.

As a result, this study found limitations with its asynchronous research methods. These

issues happen because even though methodologies help us identify user needs and pain points, the subjectiveness of mental health is still present and hard to identify with current technological solutions.

Another proven limitation is the language. Although UNIST offers itself as a full English course university, the facilities on it are run in Korean. The language may not generate direct problems for the students. However, it has been shown as a limitation for us as a researcher when gathering data from the university and it may compress the possibilities to be studied. In the same way, a Korean organizing similar study and research on the same settings would find different data and information, developing different solutions.

Finally, due to the plurality of the mental health, researchers on the Human Computer Interaction - HCI -, Computer-Supported Cooperative Work - CSCW - and Artificial Intelligence communities are engaging in this topic to continually discuss the vulnerability involved in exploring these sensitive issues [53] and how the way which we shape machines, in science fiction and reality, to interact with humans can tell us about our culture [54]. I am fully aware that working on this subject and data, closely related to emotional response and subjective qualitative experience can trigger myself experiences as a researcher and international student.

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Appendices

I Appendix I: Online Questionnaire

Due to printing limitations, we decided to only post the mentioned question on this area: Try to remember the the last time you feel sad or anxious. Can you describe how that affect your academic and personal life?

"I could not sleep well - personal life

I got stuck in my work even though I spent all day for it

I was staring my screen and hoping things would start typing by itself - academic"

It was tough to concentrate and focus on studies

Wasn't able to sleep

It didnt affect academic life, i still managed to do everything and get good grades, but personally i am not satisfied with the education program here.

Scored 3,5 of 10

It made me hopeless about my life. I lost focus in studying and hated being with people as no one was willing to help. I failed bitterly the entire semester and lost my scholarships

Most of my stress come from study. So, whenever I feels stress I can't concentrate on my study.

It is hard to concentrate.

It made me not sleep weel. I would wake up before time and always have my head down. I did not want to talk or communicate with others.

3 months ago. After passing away of my relative. Couldn't concentrate on studies

It didn't affect my academic and personal life and my sadness has nothing to do with Korea it was something that can also occur in my country

During the semester because my major is in Korean and i have to do everything in Korean, I feel super lonely and desperate.. I got depress and because of this I was sick during 1 month

It was hard to focus on my assignments and I skipped some classes because of stress and anxiety.

I didn't want to interact with people. Just wanted to be left alone. Yet resented being lonely.

It affects as a whole. Last semester, had to juggle work + 3 graduation projects + freelancer work & overseas clients. After second month of I was already exhausted. Had to go to hospital at least 4 times in the past 6 months, with many different symptoms each time. And the doctors all just said it was result of stress, that i should take ir easier... There were days I couldn't be productive, days I could only stay in bed and not move at all...

Hectic. Hard to balance everything. Mess up once and it is a slippery slope.

I'm always anxious. It makes me tired from academic and personal life

I feel sad because my family is no longer with me here, and that makes it hard to focus on studies.

Hard to focus on studies

I was able to deal with both situations because of the support my friends gave me.

It was because of my professor/lab and I think you'd understand why.

About 1-2years ago, I was surrounded by people who got stress and psychological problem. They work in the different departments but we're on the same courses. I am ok but they are not. On that time, I felt a little bit anxious because most of them shared every stress asked advised to me, as in I'm the person they can trust and heal them. If the problem is not that big, it's ok, I'm a good listener. I love to help them too, but when they almost doing suicide, that was scared me! Even one of them I accompanied to check their mental state to the psychiatry. Fortunately, God still kind to me, they got better now. It's quite affected my personal life, although not much affect my academic. Actually, Korean living is very hard, rough, and full of struggle comparing with living in another country, especially in Southeast Asia (in case of pressure).

Well it was a month ago but due to my personal issues. Yes it affected my lab schedule

My hair started falling and I got sick several times

Feeling of getting sick and having to deal with it alone is making me so anxious and when I actually got sick because of the Korean food I had to deal with it by myself, studying was defiantly a second priority.

It affects my life when making friends and also my performance on exams

Low motivation for handle the day-life activities

Didnt affect.

Well this is my first semester studying for my master and as all the classes i have is in korean language so when i dont understand what the prof is explaining i get really frustrated and lost interest to the class. I feel like im not gaining any new knowledge so i was really sad.

It affected my relationship with a korean girl.. because i had 0 confidence and felt too anxious to think straight. Also, i couldnt focus on my studies. There werent a big impact in my grades since i could study for the exams, but to feel so sad and anxious, without no sense of belonging... Its really awful

Team work where people did nothing until near deadline, and as a result I had to rush to finish their parts of the work

"I feel anxious all the time during class because I don't know if my classmates and professor will challenge me.

In addition, I feel sad during weekend because my friends can't go out with me because they are busy, lazy or broke."

When I first arrived to Korea I felt really sad and missed my country like crazy. This was probably during the first year and every time I felt stressed because of exams I just felt even more sad. I cried almost every time I spoke to my parents. But after a year and settling and having a more stable routine the felling is almost entirely gone

I had really strong anxiety crisis and almost lost final exams due to that, because i was afraid of going out from my house

The stress made it hard to concentrate on studies and my grades dropped causing even more stress.

I can't concentrate on my study/work

I was stressing about the expectations so i talked with my prof. He was awesome and accepted everything i had to say and was very respect full towards my opinion

I was edgy and couldn't concentrate so I failed to study. When my brother killed himself and I couldn't be with him.

I feel very lonely but at the same time it helps me focusing on my work

I constantly feel disappointed and honestly think Korea destroyed a (back then) successful career. During language program I got myself thinking in suicide

"Couple of semesters ago I kind of lost the feeling of ""joy of life"". I just stopped enjoying the life I was living. The only way to fight that was to sleep , as a result I almost lost my scholarship.

Had to take an academic leave after that."

People are atheists here. Their morality is bad. The show their sexual culture and shamelessness. Its offensive for me I don't go to school and i isolate myself. As a consequence i am late on my work. I couldn't focus

I tent to just lay on bed and do not do anything.

It was thrilling depression. My academic and personal life went to the deepest deep of sadness ocean.

The link to view the other responses and answers from the users is this: `https://bit.ly/2T34sxQ`.

II Appendix II: Student A raw interview

Name: Student A

Age: 21

Major: Bio medical Engineering UNIST

Undergraduate Student

Explain the idea: Mutual support for foreigners in Korea in order to fulfill the gap between international office and healthcare center Think about someone that would use this application to seek help. How would be the perfect match for this person?

I can tell you my experience with when i just came to Korea, because of my personality. I consider myself an introvert. Because new country, new culture, and this new place and place. For the introverts it is really hard to make Friends. And I don't know if Unist community was

one of the most welcoming communities maybe. SO it was really thoiught in the beginning because i did not have many friends here. So I kind of felt I was missing my old friends. My family. The things I am used to already.

But here is something bery new and on top of that maybe the educational system in Korea is one of thoughest. And in the beginning I was not doing great iun my studies. SO maybe at that time I felt something called stress, depression. Since there there is no one around we can talk. In the beginning it was like that. Maybe at that time, it would be me. If there was this kind of service I would try it.

Now, think about someone that would use this application to offer help. How would be the perfect match for this person?

I think it should be friendly. Those who you spend time. Do a lot of stuff apart from studying and this relationship just make your mind more away from this toughness of the study. Because of the main thing I was not doing well in my studies. Maybe with some friends I spend some time it would go easier because well.

But if talking about my experience, I learned the though way. I learned how to do it by myself. Getting over that and becoming more and more stronger. Just by myself. Maybe it was not the best way but it was how I got over it. Of course friends would be great. If you were responsible for creating the matching filters of this application, how would you create it? What categories do you think it is important to match those people?

There are some basic categories. This platform is designed for those feeling stress and pressure. SO maybe making divisions about, for example, I feel pressure about my study.

So maybe division between social, study, culture, I don't know. Because some of them get really well with studying but cannot fit culturally here. Maybe this is the wrong division, but maybe also language matters. Because the way you think and speak in one language, of course someone speaks same language as you can understand you better, I can say that I am Russian. Russian is my mother language. And since it is spread all around Central East Asia. So for those who speak Russian there is a lot of similarities. I can see what the Russian language do. Not only the language but also the way people speaks.

And maybe that also helps if I was searching for someone and I knew he also speaks Russian. It is much better fit for me. How would anonymity or discretion add value to this type of application/service? Is it necessary?

I think it is going to be, it has some, pros being anonymous. Because some people, maybe, have some pride and they just afraid or worried this feelings saying your name. That can be an obstacle for the person to share their feelings. Not all persons can share their feelings and what bad is happening in his life. But in this kind of service if it is like, if you can know the person, maybe it can help create better atmosphere of trust. You know his name, he knows your. One to one relationship it can be a more trustful relationship.

Regarding international office, how do you feel regarding trust over the International Office at UNIST and its services related to mental health support?

I never did that. I didn't even know they offer some mental support. But, I don't know if there was, I know some person that was working there, since I know the person personally I would appreciate its help. But I did not know that there was this kind of service. And for me it is much better to talk with my friends about these issues.

I never went to this health mental center because I had no experience with that. But the beginning of my experience in Korea which was though and I got over that. If OIC offers one maybe if anonymous service thing if they have an announce or something, if you can be anonymous if they can design something to communicate. If all students can go and contact them... Maybe most of them because of pride would be beneficial for the students. So I see it as a beneficial point.

Regarding healthcare center, how do you feel regarding trust over their services at UNIST on mental health support?

For me, those mental issues, when nothing helps family, friends maybe this is the last thing you should do. And that is why I never experience or saw this kind of situation. I never think about going to places like that.

An example of myself, I can't just go to some psychiatrist. Because of my pride I can't go.

III Appendix III: Student B raw interview - in Portuguese

Name: Student B Age: 28 years old Major: Computer Science Ulsan University

"Koreans have the mentalidade de "engole e continua" mas isso nao parece funcionar para eles pelas altas taxas de suicidio e depressao"

“Outra coisa que acho ruim, eh colocar uma margem tao alta para as notas para conseugir ir ao proximo estagio. Isso atrapalha muito, nao so pros estrangeiros, mas as notas altas e exigencias fazem com que os coreanos fiquem muito ansiosos e chegam a “nao ter vida” alguns..”

“Uma boa seria ter um matching de dois niveis, um sem saber as pessoas e sem saber do outro. Quais as minhas dificuldades e o que eu busco. Depois disso, caso tenha interesse de ambas as partes eh possivel ter um “novo match” com maior numero de informacoes para compartilhar identidade e se tornar mais intimo”

Matching ideal para te ajudar

“Nesse aplicativo, seria bom se eu pudesse ver as caracteristicas desse anonimo o quanto tempo ele ta, as atividades que ele ta, que areas ele quer ajudar. Porque dessa forma, se eu vejo um corenao que esta estudando lingua inglesa e quer ajudar estrangeiros a entrar na universidade pq ele gosta de estrangeiros, eu vou ter interesse em falr com essa pessoa pq esta relacionada a minha dificuldade

Matching ideal pra tu fornecer ajuda

“Como eu sou uma pessoa com alta empatia emocional, se eu for usar esse programa, eu gostaria de ajudar epssoas a relaxarem e que estao ansiosas. Ser um ombro amigo, dar conselhos, ajudar a pessoa a entende ro ponto de vista dos estrangeiros. Ouvi falar de uma colega, que um coreano ve ume strangeiro e eles automaticamente nao falam coreano. Tem dificuldade de como agir. Eu acho q eh muito importante que tivesse isso de , mesmo q fosse um manualzinho, como normalmente os americanos se comportam. Na internet tem muito disso, “estereotipacao” .

Coisas q x ou y fazem q os acham estranho, seria bom ter nesse aplicativo uma parte desses topicos. Na grecia tu nao pode fazer o Joinha, pois para eles eh um insulto. Entao, num aplicativo ter uma secao de nao faca isso ou faca aquilo, ter dicas em relacao a comportamento seria mto bom pq os coreanos, por crescerem mto rapido economicamente e em questao de pais, eles focaram em construir o pais e nao tiveram tempo para conhecer os estrangeiros de hoje. Desde que a ultima vez, a imagem dos coreanos em relacao aos estrangeiros imo parece um pouco expirada / atrasada.”

Cultural similar ou linguagem

Seria melhor no matching uma filtragem onde o usuario escolhe. Tem pessoas que preferem ter ajuda pessoas de outros pais, Mas ao mesmo tempo tem pessoa sque gostariam de ter alguem

de outro pais como matching. Melhor deixar o usuario decidir, pois se restringir vai dificultar ate para a troca para ajudar as pessoas a conhecerem outras culturas e quebrar essas barreiras contra estrangeiros. Enfim, deixar a gosto a pessoal.

Anonimato

Anonimato nao eh imprecindivel. Contudo, existem pessoas que preferem saber queme sta ajudando e outras q preferem nao saber quem os esta ajudando. Os sistemas q mais estao dando certo com criancas coreanas para aprender ingles eh com um robo e um professor o controlando remotamente.

Como existem esses dois tipos de personalidade, manter o anonimato como base pode ser interessante "dont trust no one online because it is an old pedhopile" entao oanonimato da uma sensacao de poder e de poder se identificar para o outro caso se sinta confortavel. Trust

Internacionais

"Os estudantes internacionais desde que falem a mesma lignua tendem a se unir bastante, nem q seja para "ir ali" tomar um milkshake ou coisas mais simples. Eu acho que eles tem uma tendecia para se ajudar mas preferme se unir para desestressar e trocar figurinhas."

Coreanos

"Os coreanos aqui, na Ulsan , eles tem mto receio de conversar com os estrangeiros. Muito mais pela barreira linguistica do que qualquer outro motivo. Porque os coreanos que eu converso mais sao muito simpaticos, mto legais, e eles vieram falar comigo porque eles falam ingles. Enquanto isso as meninas que faziam a ronda do quarto chegavam super apreensivas e tensas pq nao falam ingles.

Embora eu ja tenha ouvido relatos de uma ex colega, normalemtne os coreanos sao mto simpaticos com os estrangeiros aqui pelo sistema de notas da universidade. "Alguem tinha me ajudado numa epoca" e depois quando minha amiga precisou de ajuda de novo ouvviu um "so estava te ajudando pq ia ganhar nota na epoca". Isso reflete mto mais na cobranca de notas do que na personalidade da pessoa em si."

Sinto que com o anonimato posso trust em ambos. Ambos ficam tipo "nao quero me comprometer" e tem medo de algo nao dar certo. Eles querem ajudar sem se comprometer. Entao se for uma questao de anonimato essa ajuda daria menos essa impressao de que se eu ajudar vou estar me comprometendo no estilo assinar contrato.

Ambiente de estudo / aula

“Os materias coreanos de ajuda de turismo e com alingua sao mto bons. Mas os metodos de ensino sao muito ultrapassados. O metodo eh decora e depois cospe tudo an prova. Isso so funciona com os asiaticos que tem esse metodo, mas pra westerns isso eh ultrapassado pq as pessoas decoram e depois esquecem. Principalmente se a pessoa for alguem que tem deficit de atencao pq a pessoa decora e depois esquece.

Tem uma professora que deixou bem claro que ela nao gostava de mim. Olhava para mim e dava cara de nojo. Nunca chegou a um bullying fisico mas todos os professores quando faziam “como eh no seu pais” sempre me deixavam por ultimo. E quando tinha aqueles “viajar para o seu pais” o seu pais eh bonito mas era algo que escutava sempre.

Vietnam, Europa, todos esses lugares nao eram colocados empencilho em relacao a esses lugares. Eles (profs) nao querem se comprometer, “quero arranjar um emprego, podes me ajudar?” “mas voce falta um mes ainda tem tempo”.”

Staff

“Sinceramente, honestamente, eu acho que o staff daqui eles estao “cagando e andando” pros estrangeiros. Falei pro meu staff o mesmo problema em relacao a trabalho e eles falaram “this is not a job searching place” “go online”. Pedi para ligar para outra universidade quandoe stava aplicando para otura bolsa e o que ouvi foi “this is not a agencia telefonica”. “Eu nao quero pedir ajuda para voces eu tambem nao gosto” “Ok, I will help you only this time”.

Eu tive pessimas experiencias com colegas de quarto. Aqui eles so veem lingua e personalidade. Minha primeira cologa de quarto queimou o meu dedo. Ela queimou o meu dedo. Tentou me matar. Ela tnah uma faca, acendia o isqueiro no quarto, eu tenho alergia e tudo mais. “Voce pdoe morrer se eu quiser” “If i die it is your fault” “I dont give a fuck”.

Essa colega de quarto quebrou todas as regras e eu tinha provas. Ela nao foi expulsa. O staff me informou “Ja que voce esta tendo problema com ela podemos te trocar de quarto” “quem esta causando problemas eh ela” “Como se tu fosse a cul;pada”. Eu acabei desistindo de falaer. Nao eh possivel q terei q passar pelo problema disso se o problema eh ela. Falaram com ela e a trocaramd e quarto. Foi ai que comecei a dormir morrendo de medo pq ela estava no mesmo dormitorio.

IV Appendix IV: Personas

Figure 13: Supplementary data: Persona Edgar Vivi

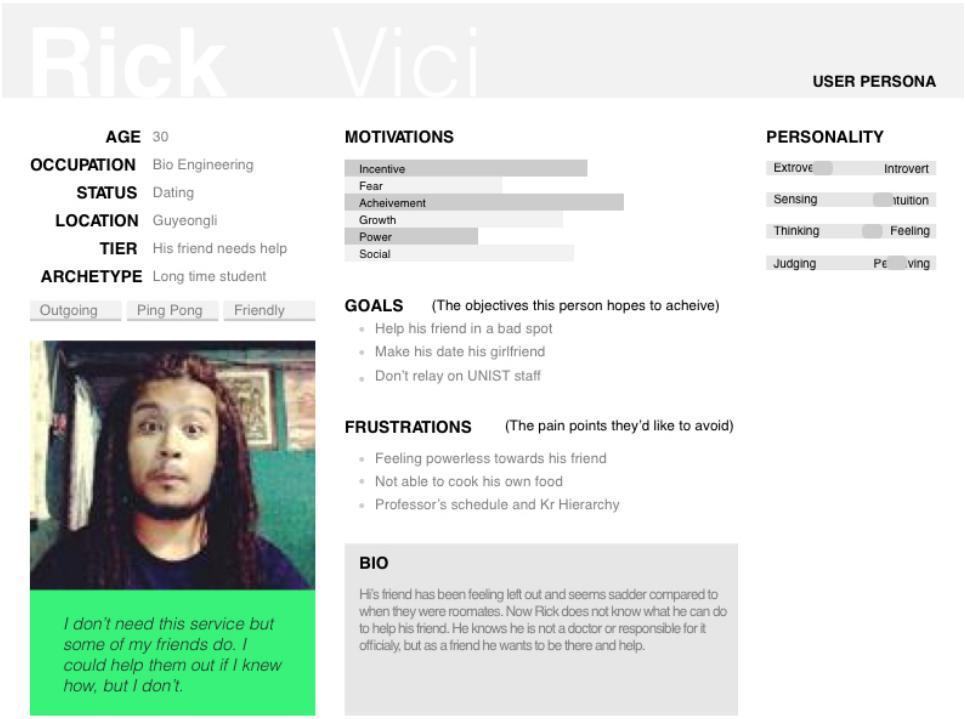


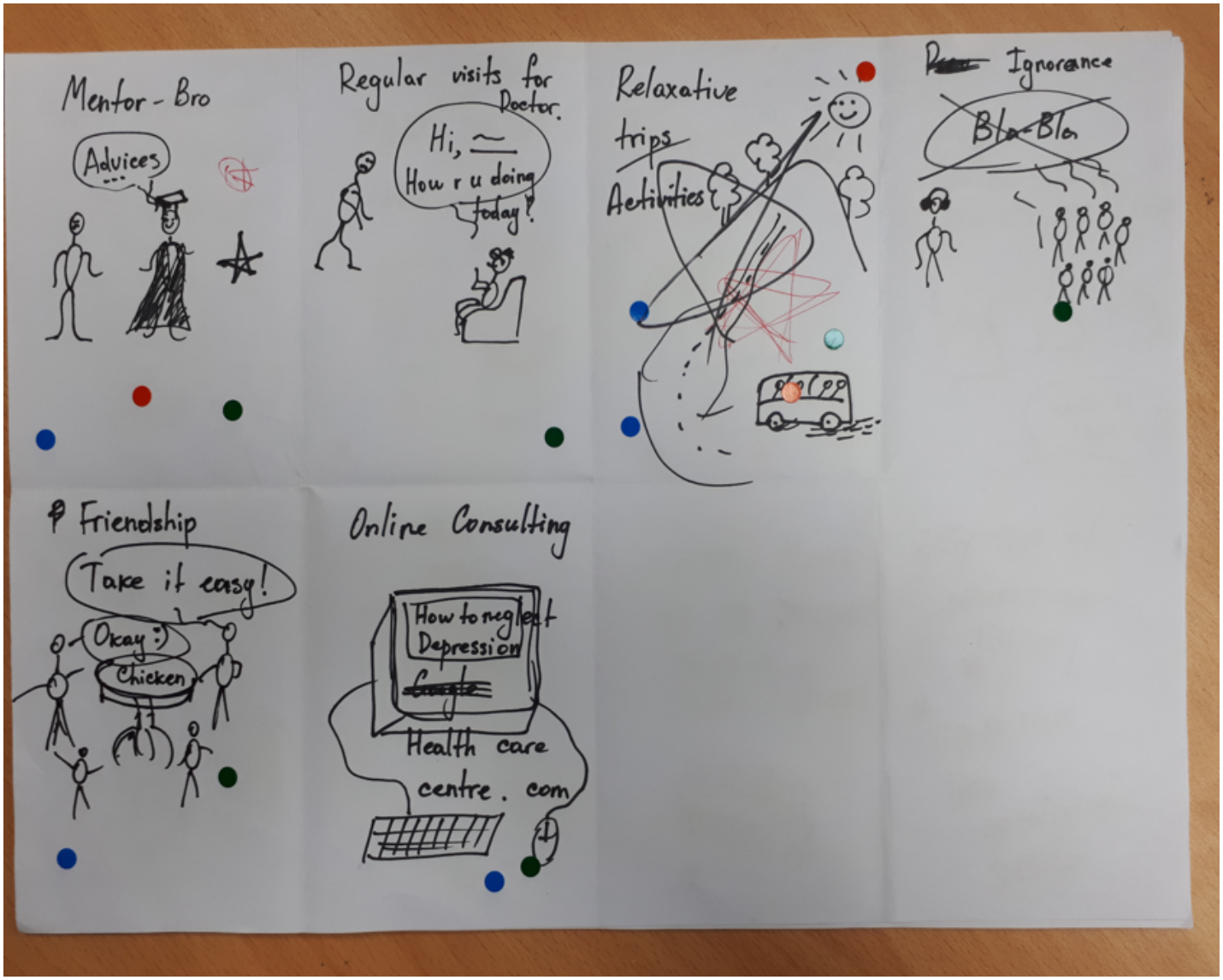
Figure 14: Supplementary data: Persona Rick Vici

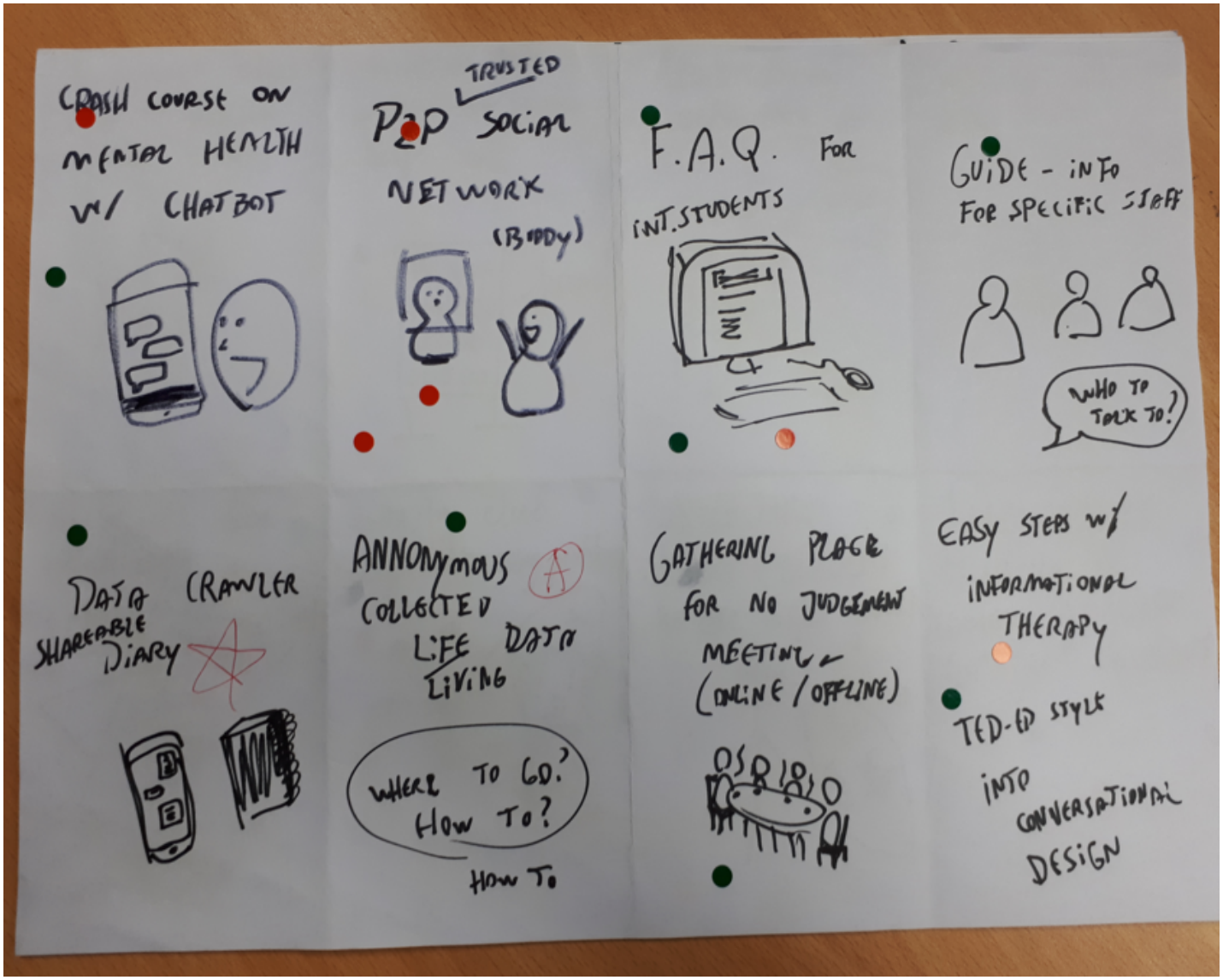
V Appendix V: Design Sprint heat maps

	Person in need of help perceived heat map											
	Stakeholders	"How Might We..." questions										
	Experienced Professional											
	Staff / Professor											
	Person in need o											
	Peers	Feel more welcoi										
	Same Exp Stude	Deal with the Pre	Solve similar issu	Find someone from the same field/senior								
	Perceived issues	"How Might We..." questions										
	Easy steps for de	Make the lows less lows										
	Others Judgeme	Reduce Judgeme	nts									
	Trust Issues	Feel less isolatec	Be more aware from people from the same country									
	Directions to take	"How Might We..." questions										
	Talk with profess		Make medicine n	Help w/ after gra	Learn about med	Impostor issues	Balance highs / l	reduce harmfull i	Cohibit problems			
	Talk with Peers											
	Talk with Staff/Pr	Know who to talk	Better advisoring	Advisor interactic	Lab atmosphere	Interest of persor	Reduce waiting t	Make dorm bette	More events for i	Better communic	Better understood by staff	
	Person with curiosity towards mental health											
	Stakeholders	"How Might We..." questions										
	Online Informatic	Make Health care	Test our own me	Deal better with scholarship issues								
	Person in need											
	Person which wa	Share annonymous info / issues										
	Perceived issues	"How Might We..." questions										
	Not comfortable (	Alcohol Culture										
	After knowing he	Know point of contact										
	Self problems firs	Open ourselves (	Learn about small details regarding living									
	Acceptance & Ju	Feel supported during the semester										
	Directions to take	"How Might We..." questions										
	Crash course into	Create mental help support										
	Person who wants to help someone in a perceived bad mental health state heat map											
	Stakeholders	"How Might We..." questions										
	Person in need	Find people with	Deal with Korean	How to deal with	Deal better with other int communities							
	Person which wa	Able to reccomend to a Professional										

	Staff professiona	Mostly in Kr 1/4th										
	Perceived issues	"How Might We..." questions										
	Trust	Make people trust										
	Optionless / not v	Open up & Share	problems									
	Informational sha	Lack of informati	Open information	Share information from lab and courses								
	Directions to take	"How Might We..." questions										
	Take out from isc	Create a commu	Reduce in lab lar	Feel welcome at unist facilities								
	Teach him/her hc	Help people trying to survive										
	Data Gathering	"How Might We..." questions										
	Data Gathering	Open Knowledge	Make doctors mc	have better knowledge about students								

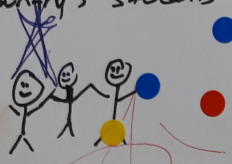
VI Appendix VI: Design Sprint Crazy 8s





CULTURE SHARING

- Presentation, cultural experience, traditional foods etc.. dance, music
- Shared by each country's students



BUDDY SYSTEM

- Meet with same country or department people when you are freshman

STUDY PATH

- Help students build their way from the start.
- Figuring out on the way is too late in Korean students.

ACCESS TO INFO

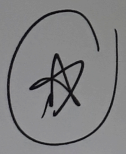
- Build more friendly web-site/app where people can find info related to experts/staff/prof.

FRIENDLY STAFF

- Have a bonding events with Staffs
or
- Hire carefully

BONDING

- Hobby exchange to create trustable environment

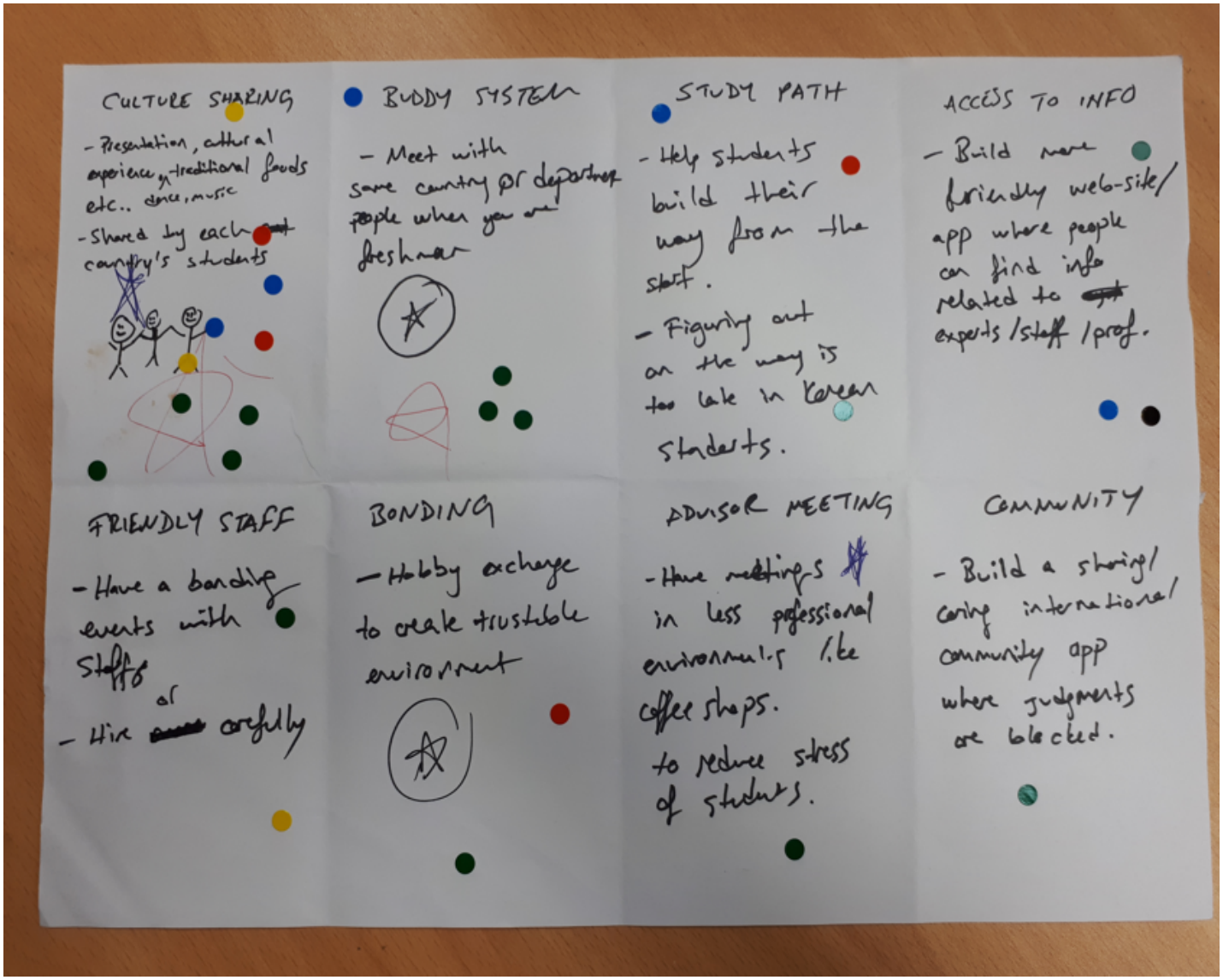


ADVISOR MEETING

- Have meetings in less professional environments like coffee shops.
to reduce stress of students.

COMMUNITY

- Build a sharing/caring international community app where judgments are blocked.



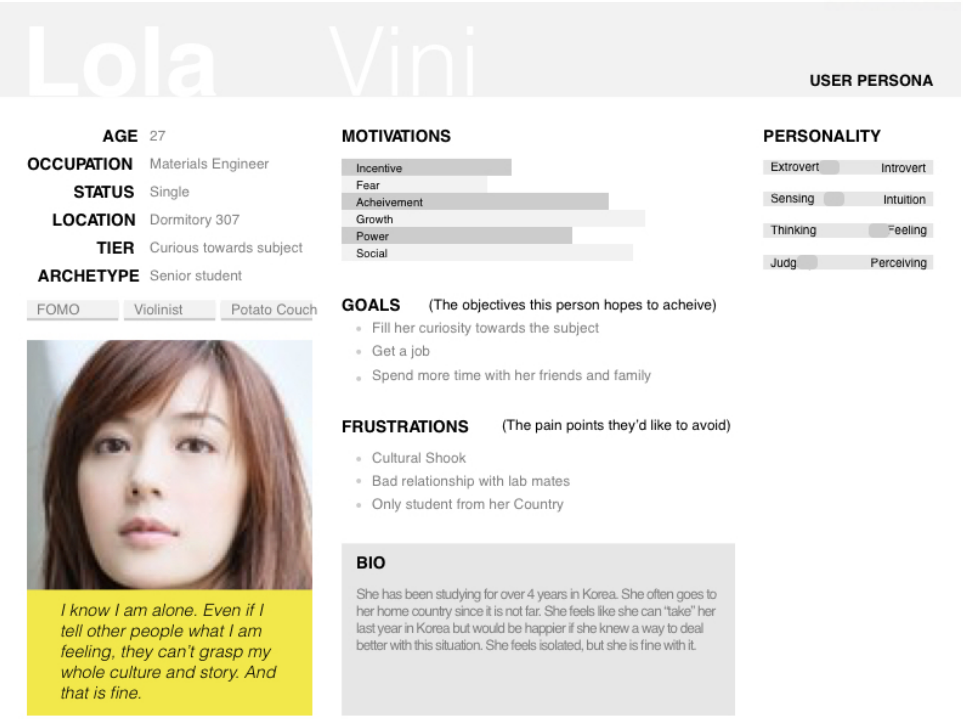


Figure 15: Supplementary data: Persona Lola Vini

VII Appendix VII: Figma design and prototype

The working file can be found on the link:

`https://bit.ly/2GDYHp8`

The prototype can be seen at:

`https://bit.ly/2Qflnje`