

DESIGN INTERVENTIONS FOR PROMOTING THE MENTAL HEALTH OF YOUNG ACADEMICS

Ma, Sanghyun; Ruensuk, Mintra; Kim, Chajoong

Ulsan National Institute of Science and Technology

ABSTRACT

It is essential to graduate students to contribute researching in their academic field. Although it leads to the success of academic career path, the students are more at high risk of mental health problems. Thus, this study attempted to reveal underlying causes of the problems, figure out coping techniques and explore design interventions that can improve of graduate students' mental health quality. We conducted interviews with one health professional expert and twenty-five graduate students. Design Sheet was created to elicit design solution ideas and distributed to ten professional designers. From the research, we have found out that graduate students are suffering from multiple reasons however there are unmet mental health needs among graduate students. By the end of the paper, we propose five design guidelines for designers to make products or services to promote mental health of graduate students.

Keywords: Human behaviour in design, Design theory, Industrial design

Contact:

Ma, Sanghyun
Ulsan National Institute of Science and Technology
Creative Design Engineering
Korea, Republic of (South Korea)
mshjang@unist.ac.kr

Cite this article: Ma, S., Ruensuk, M., Kim, C. (2019) 'Design Interventions for Promoting the Mental Health of Young Academics', in *Proceedings of the 22nd International Conference on Engineering Design (ICED19)*, Delft, The Netherlands, 5-8 August 2019. DOI:10.1017/dsi.2019.95

1 INTRODUCTION

Graduate students tend to pursue the academic degree by examining research evidence, requiring genuinely understanding research and making a lot of effort. They need a significant amount of time concentrating on their work that ranges from an individual research project to lab projects. Contributing to research outcome is essential to graduate students. When the students put a lot of efforts and concentration on their work, there are mainly two different consequences. Firstly, they achieve a successful result. It may lead to an absence of mental health problem. On the other hand, when the pressure coming from the work gets excessive, it may start to damage mental health such as a prevalent depression and anxiety in younger academics (Kinman, 2001).

A previous study has suggested that graduate students are at high risk for mental health issues (Gewin, 2012). More recent study revealed that the students are more than six times as likely to experience depression and anxiety as compared to general population (Evans *et al.*, 2018). This is largely due to social isolation and high expectations, and leads to sleeplessness of graduate students. Even if students feel that they can handle the isolation and stress such as problems in a relationship with an adviser or a partner (Gewin, 2012; Evans *et al.*, 2018), anxiety caused by students' financial status can also push the students from a stable mental state to an unstable mental state (Hyun *et al.*, 2006; Hyun *et al.*, 2007).

The prevalence of mental health problems in graduate students has increased in many countries over the world. For example, the report from the Graduate Assembly research at UC Berkeley found that 47% of PhD students and 37% of Master's and professional students score as depressed (Panger, 2014). Another study from the University of Arizona also reported that since the students began graduate studies, their mental health is worse and that stress has increased (Smith & Brooks, 2015). It also revealed that there were no significant different patterns between doctoral and master students. While previous studies have slightly discovered the mental status of graduate students in the United States, it still remains unclear about mental characteristics of graduate students who are enrolled in Asian universities.

South Korea has been widely known for the country with high level of educational achievement (Sorensen, 1994). According to Times Higher Education Asia University Rankings 2018 (Times, 2018), eight Korean universities are listed in the top twenty-five best universities of Asia with the high score of teaching, research, citations, industry income, and international outlook. On the positive side, this educational zeal led to the development of national economy (Lee, 2006). However, many problems have been arisen such as a competitive education system, and academically-oriented society, elitism on the basis of academic (Lee, 2006). More than 40% of the graduates from South Korean universities reported that they did not receive a desirable treatment in South Korean society (Korean Educational Development Institute, 1992). More recent research found that students in South Korean universities often experienced depression, anxiety, and stress (Song and Lindquist, 2015). More than half of the university students are subjected to have depression (Chung and Kim, 2010). We believe that taking South Korea as our sample may reveal interesting insights of mental problems of graduate students because of its reliable education system and strong evidence of mental health problems. Therefore, one of our study aims is to understand current mental health situations of graduate students in South Korea.

In order to manage mental health problems, students may use indirect solutions to solve the problems such as using alcohol and drugs, and to access healthcare services with a physical expression such as headaches and sleep disturbance (McGuinness *et al.*, 2009; Mori, 2010). However, if the remaining causes remain unresolved, it may continue to reduce the students' overall level of functioning (Raunic & Xenos, 2008). Researchers have explored solutions to undermine mental problems of university students. It ranged from addressing the mental health needs of college students (Levin *et al.*, 2017) to investigating the attitudes of the students on mental health help-seeking on the Internet (Chan *et al.*, 2016). Research related to mental health and mental problems of university students is not limited to an only particular group of researchers, but a broader range of research areas such as psychology, health informatics, human-computer interaction as well as design.

Design researchers have observed the need for studying about mental health and mental problems for various purposes. For example, Lee and Hong (2017) promoted mental health to college students by suggesting emotion tracking solutions. Students expressed various emotions using tangible interaction

with plasticized clay and found this design solution useful. They were motivated to track their emotions to reflect their emotional state on daily basis.

Other researchers identified opportunities to using technology-mediated peer support to promote mental health (O'Leary *et al.*, 2017). The guidelines suggested that peer support can be enhanced by using technology to match peer with similarities and advance the accessibility. It also can alleviate the risks by technological training or intervention. Although mental health gains attention from researchers, little is known about the design solutions. These attentions go to generic people and students but not to graduate students with mental health problems. As it is mentioned, high number of graduate students are undergoing with mental health problem and reaching out for a help. Now mental health is a global issue and graduate life is what we are facing right now, Therefore, our study aims to provide design opportunities and guidelines for design practitioners. Design practitioners will then utilize the design guidelines in order to create design interventions that can improve the quality of graduate students' mental health at university.

2 METHOD

In order to gather reliable data on current mental health problems that graduate students are undergoing and actual coping techniques that the students are using, we adopted an expert interview and interviews with graduate students. We used the data collected from the interviews to discuss design interventions. We invented 'design sheet' technique by analyzing previous interviews to gather creative solutions from current designers.

2.1 Expert interview

We began our study by interviewing an expert in the field of mental healthcare. In this case, we interviewed a psychiatrist who is working at a healthcare center at a university since 2016 (see Figure 1). The semi-structured interview took approximately 40 minutes to complete. We briefly explained our research aims to the psychiatrist and sent out the questions to ask the psychiatrist beforehand. We sought for professional's perspective of the topics: current mental health issue of graduate students; causes; the students' coping strategies; treatments and existing solutions.



Figure 1. A scene of the expert interview session with a psychiatrist

2.2 Interviewing graduate students

The qualitative data obtained from the expert interview was used to develop questions for a deeper understanding of the mental health of graduate students. The participants were recruited by word-of-mouth and internal social media sites. 25 participants volunteered for the study (18 males and 7 females with a mean age of 28.18). Seven students were PhD candidate. Two students were pursuing the master and doctoral combined program. The other sixteen students were master students at the

time of the interview. A semi-structured interview was conducted. It took approximately 30 minutes each session. The participants were interviewed individually and were informed that their data would be used for academic purpose only. We were allowed to do note-taking and voice-record the interview.

2.3 Design sheet

Design Sheet was developed to elicit preliminary design solutions from professional designers. Figure 2 illustrates the sheet that contains instructions and an example. Designers were motivated to generate ideas and shortly describe them in a written form. Ten professional designers having more than 2 years in design practice voluntarily participated in the design sheet session. The average age of the participants was 28.5 years old and the gender ratio between male and female was 5:5. The design sheet study was conducted in a way that the designers complete the sheet sent by email and printed out. The method was somehow efficient with high accessibility from diverse areas.

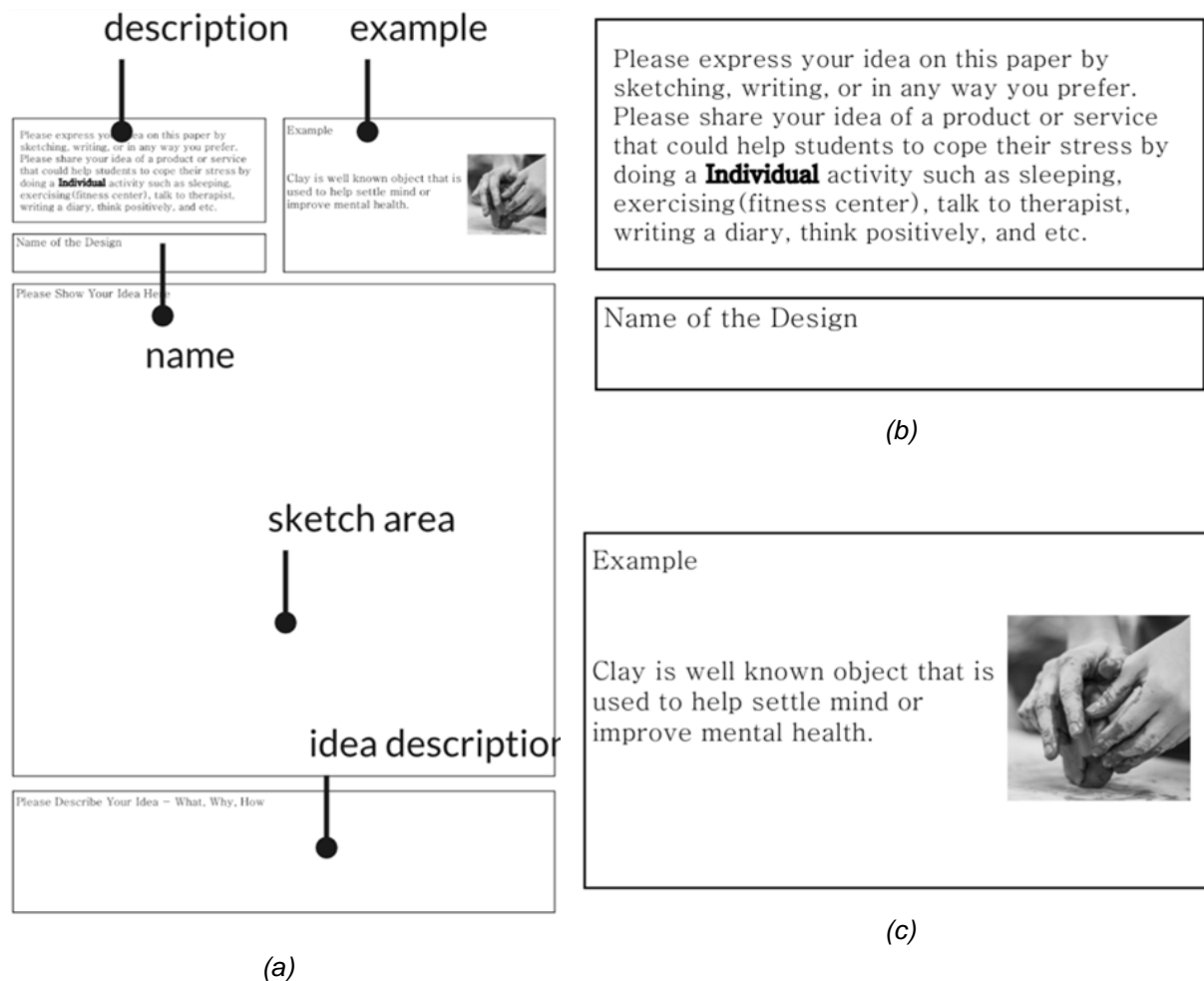


Figure 2. Design sheet of individual coping technique (a), description (b) and an example (c)

3 RESULTS

With the aims of our research, we wanted to uncover the current mental health problems and coping technique suggested by graduate students and its limitations in order to provide design guidelines to designers for creating solutions as design intervention. In the following sections, we present our findings, examples, and descriptions that best capture the core themes and emerged in analysis. We begin by describing the various problems facing by graduate students from health professional expert as well as from graduate students themselves. We then highlight how the students cope the problems. Finally, we present the taxonomy of design guidelines based on the proposed design solutions from the professional designers.

3.1 Current mental health problems of graduate students and causes

It was found that the concern about mental health problems are partially caused by lack of national support. According to the expert from expert interview, “Many Korean universities have lack of healthcare center at school. If they do have the health center, they usually employ the least number of psychiatrist and psychologist. The expert also explained the roadmap for easing this problem, “We cannot easily increase the number of psychiatrist or psychologist at the short period. What we can do is to increase the number of services the healthcare center can provide such as mobile applications that advise students to cope with their stress before it happens.”

10 out of twenty-five graduate students we interviewed experienced stressful situations caused by research deadline and research quality while students usually focus on lab project as well as independent research. The graduate students were told to deliver only quality research outcome that qualifies enough to be published in top-tier venues. P1 expressed, “I have to contribute to a lab project and my independent project at the same time. Both have its own schedule, and that drives me crazy. It is not only about the time and deadline. It is about the quality of my research too.” P2 also confirmed our finding, saying “I am easily affected by lab projects regardless of how much I got paid. [...] It makes me so stressful.”

Meanwhile, the graduate students, 17 out of twenty-five students, were also suffered from the professional relationship. To be more specific, they often have relationship problems with supervisor, colleagues, and collaborators. Seven out of twenty-five participants stated their worries that they declared themselves as a student and this may mean that they are not ready yet to deal with the professional relationship. P3 stated, “I am told to manage projects with a client, I mean the persons from a real company. It was totally new to me. I am under pressure. I don’t know how to manage this relationship.” According to our observation, most of the graduate students often do not need to contact the client directly. Instead, they must talk to his/her supervisor in order to progress the lab project and independent work. Therefore, they view that having a good relationship with the supervisor is essential. P4 said, “I have to report my progress to my professor every week. I want to make him happy with my work, but I sometimes could not make it. It is tough for me to manage the relationship with him. Sometimes I do not understand what he wants at all.” Although few participants worry about the problem with colleagues, many of them reported getting support from colleagues who are in the same situation. P5 reported, “I am glad to have friends around. Friends support me all the time and I do so to friends too.”

3.2 Current coping techniques suggested by graduate students

We observed that graduate students periodically notice their stress level. They often discover coping techniques that match their characteristics. Three out of twenty-five participants prefer to do nothing or ignore the problems they have been facing. P4 said, “When I know I am stressed, I try not to think about it. I won’t let it stuck in my head.” Twelve out of twenty-five participants do physical activities to release the stress such as sleep and exercise. Many participants stated that it was not easy to ease problems alone without any supports around. They also realized that no matter of supports they have got, they must learn to stand on their own legs. P6 explained, “It has never been easy for me [...] I have to be strong. I am trying my best to control myself by thinking positively.” A conclusion could be drawn that most participants tend to solve mental health problems by using such individual coping techniques. It was discovered that activity, technique, product, or service that is used to cope or help relieve mental health problems was done by graduate students alone.

Although the relationship with people around graduate students stated as one of the problems that trigger mental health problems, it was found that having social support from such people appears to cope with their mental health problems. P7 said, “We are graduate students, unlike undergraduate students, we are isolated. We have fewer friends and less social support. Whenever I got supported by someone, I feel full of my heart. Especially, for those who truly understand my complicated research situation.” Many participants generally prefer to have activities with others such as drinking, playing sports, and going to Karaoke. P8 said, “I go out for Karaoke with my lab mates every week. We must go, really must go. It helps relieve my stress a lot.” We wrapped up this coping technique as social coping. Social coping refers to such activity, technique, product, or service was done together with graduate students around and other parties in order to cope or help relieve mental health problems.

4 DESIGN CONSIDERATIONS TO PROMOTE MENTAL HEALTH

The expert interview and interviews with graduate students revealed the underlined problems and current solutions to mental health problems. We carried findings to professional designers to design interventions for graduate students with mental health problems. The goal of the design session was not only for solving the problem but preventing causes of problems for the future. Through design sheet methods, designers were asked to bring up ideas which could be service or a product for two coping categories: social coping and individual coping. A total of 20 ideas of intervention were derived from the design sheet session and the ideas could be broken down into 11 ideas for social coping and 9 ideas for individual coping. All ideas were sketched by hand with detailed explanation. Therefore, an affinity diagram was used to analyze the sketches to shed light on the design taxonomy. To this end, five taxonomy of design interventions were proposed: Relaxation, Indicator, Suggestion, Sharing, and Community.

4.1 Relaxation - design to use one of the five senses of human such as smell to calm its unsettled mind and control their emotion

Relaxation was literally meant for relaxing. Design practitioners used one of the five senses of human, a smell which is widely used for calming stress, for this idea (see the left one in Figure 3). It is an electrical candle that user can set a time. When the time comes, a user can smell a different smell from this electrical candle. Design practitioners tried to help graduate students to calm their mind by smelling a pleasant scent. It can be placed anywhere in a lab, so all lab members can enjoy the excellent scent and have a positive impact from it. One designer also used touch sense to help graduate students to control their stress (see the right one in Figure3). Students can use the product by grabbing a rubber ball hanging on a wrist band to massage their hand.

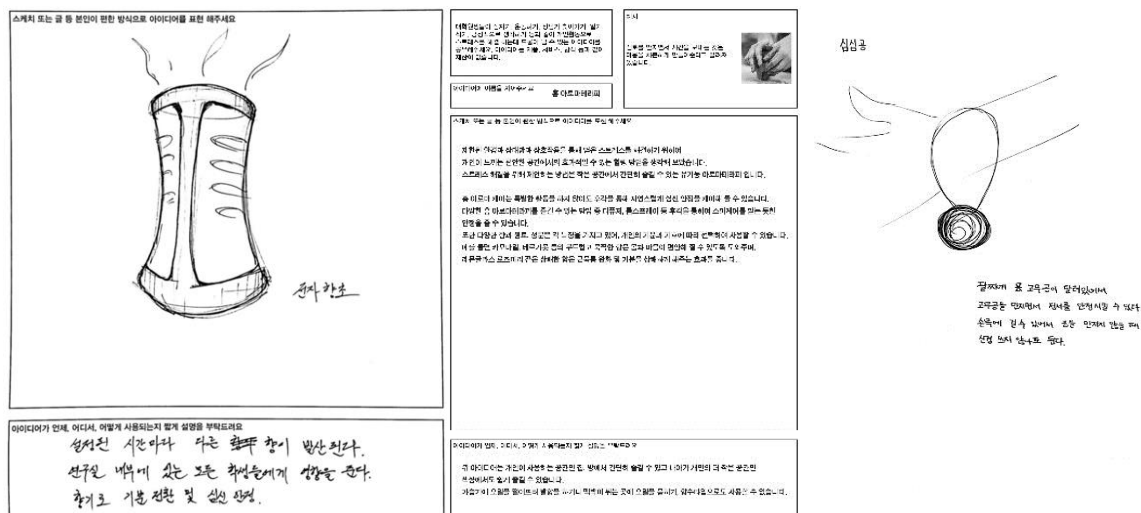


Figure 3. Electrical candle (left), aroma therapy (middle), and rubber ball (right)

4.2 Indicator - design to detect the user's negative emotional state and indicate the situation so the user can recognize their status before it gets worse

The main idea of Indicator is using a smart device to indicate user's emotion differences. For example, the concept of the idea (see the left one in Figure 4) is using a smart watch with a matching application. When the watch detects an unusual heart rate and a high difference in body temperature, it will send the data to a mobile app. After that, the mobile application will search for other students within a certain radius who are also going through stress. So, the aim for this idea is to make the graduate students stand up from the desk and hang out with friends which will help to clear their stress easily and to improve their mental health issue. Another idea also used a smart device. Smart watch detects users' heart rate and body temperature (see the right one in Figure 4). When it senses an unusual state of the student, it will send the data to a tea dispenser. The tea dispenser will use a big data to find out a best fitting flavour which helps to control their stress and indicate the situation to the user to aware of its status.



Figure 4. Utilizing smart watch (left), utilizing smart phone (middle), and tea dispenser (right)

4.3 Suggestion – design to suggest a solution for users to help to brake the sedentary situation and refresh their mind

Suggestion means that a product suggests a solution for users to relive negative emotions. The left idea in Figure 5 is called a stand-up light. Basically, the function is same as an alarm clock. A user will set a time, and when the time comes, the light will go off, and the stand will be closed. The difference is that it is not using a sound but showing by a physical movement. By showing the movement, it is suggesting users move out from the desk and take a rest. Desk is the main work place to graduate students which means it is main place where stress comes from. The product tries to break the situation. One design practitioner designed a smart mirror which detects the user's emotion (see the right one in Figure 5). After the mirror scanned the user's emotion, it will use a big data system to suggest which food to eat for calming graduate students' mind, and clothing to wear that day, and more.

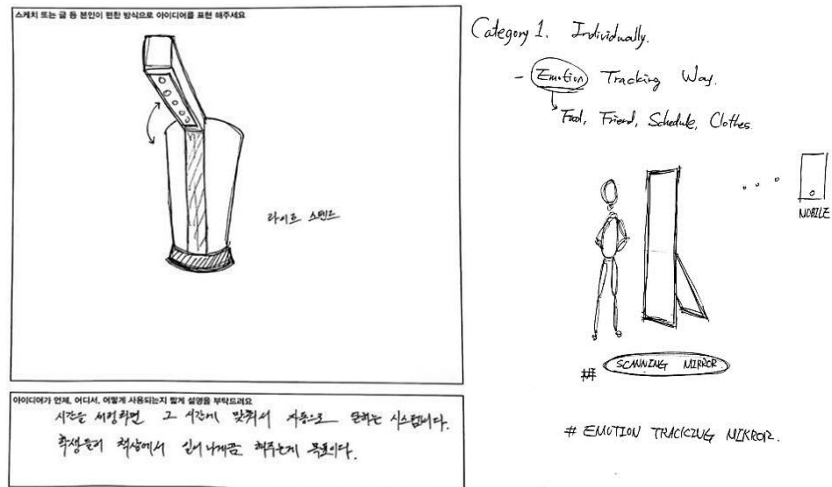


Figure 5. Stand-up light (left) and smart mirror (right)

4.4 Sharing – design to provide a platform where users can upload their story or emotion of the day to share with peer students and feel empathy

Sharing is literally sharing the users' story with others. The left idea in Figure 6 is a sketch of online diary. It is a mobile application that users can write and upload their stories or emotion of that day. Other graduate students can write a reply on it and give sympathy. The design practitioner is asking graduate students to bring out their stress by writing it instead of keeping it by themselves; students will be released from their stress by speaking out and get positive energies from replies of peers. The idea of cheer-up box is to give a positive message to other students in a campus. When the box receives messages, it will light up. The brightness of the light will tell the number of the messages. Students can notice that they are supported by watching brighter light coming from the box.

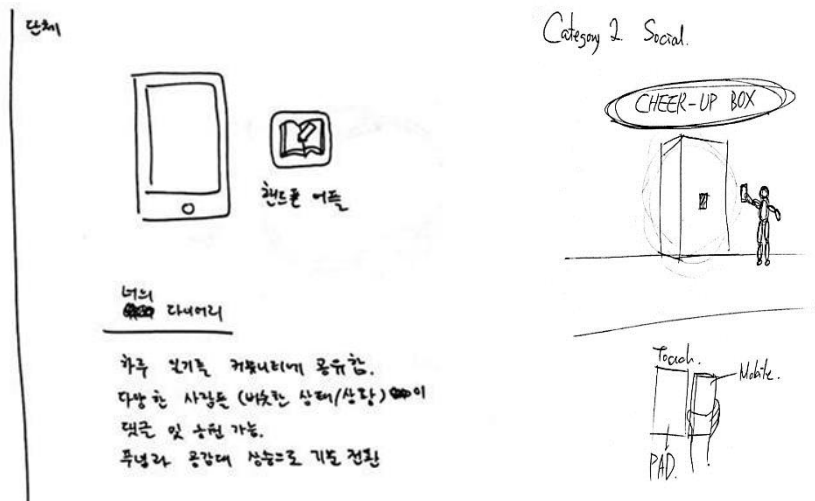


Figure 6. Online diary mobile app (left) and cheer-up box (right)

4.5 Community – design to help and suggest leaving the situation and socialize with peer students doing activities

Community means spending more time with people and get supported by each other. The design practitioner said that the interaction between human and human is significant to heal the mental health problem but also communication between human and animal is highly recommended for healing mental health problems. At the animal café (see left of Figure 7), students can interact with companion animals such as dogs and cats and also interact with other students at the same time. Students can be free from stress during the moment of interaction with animals and be the starting point to overcome their stress. There will be a camera running 24 hours, so whenever students want to see those lovely animals, they can access a mobile application. A smart watch with mobile application is introduced in Indicator guideline section, however it can also be included in Community design guideline section. It forms a community by finding friends or peers who are experiencing a similar situation and encourages students to socialize with others.

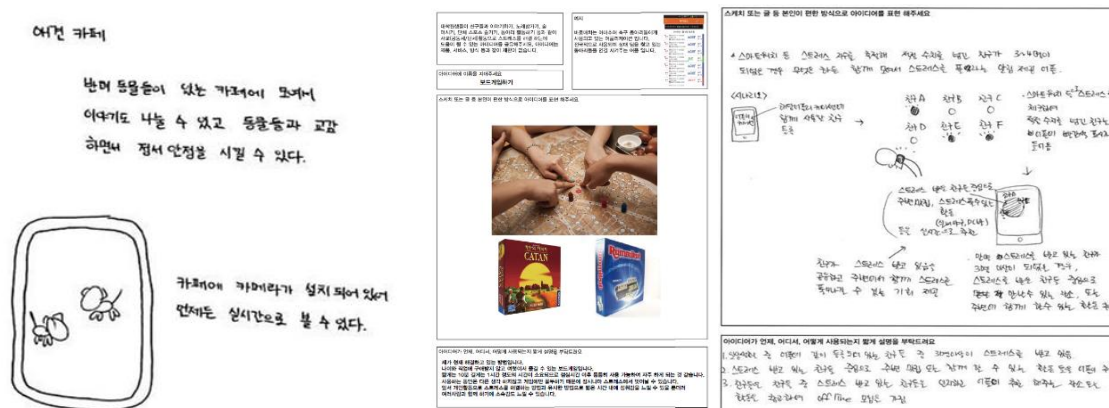


Figure 7. Animal café (left), boardgame (middle), and smart watch with a mobile app (right)

5 DISCUSSION AND CONCLUSION

The study explored current problems and solutions to mental health problems of graduate students particularly in South Korea. An expert interview and interviews with graduate students were conducted. From these interviews, we could find an interesting result. Mental health problem factors and coping methods of the graduate students in US university were similar with in Korea university. Concern for their career after graduation, living condition, academic success, and financial confidence were influencing mental health of US graduate students (Panger, 2014) as graduate students in Korea university were also facing the same matters. We could also see the similarity in stress coping methods. They both try to hang out with friends, participate sports activities, or enjoy drinks. We found that graduate students have been suffering from mental health problems, indeed. This finding

has revealed that students enrolled in Asian universities have the similar shape of difficulties as previous research in US (Smith & Brooks, 2015).

Design sheet was developed in order to encourage professional designers to ideate interventions in an efficient way. As a result, the taxonomy of interventions and proposed five design considerations were proposed: ‘Relaxation’ design to use one of the five sense of human sense such as smell to calm its unsettled mind and control their emotion, ‘Indicator’ design to detect the user’s emotional difference and indicates the situation so the user can notice their status before it gets worse, ‘Suggestion’ design to suggest a solution for users to help to brake the sedentary situation and refresh their mind, ‘Sharing’ design to provide a platform where users can upload their story or emotion of the day to share with other students and feel sympathy, and ‘Community’ design to help and suggest to leave the situation and socialize with other students who are having a similar situation. It is expected that the guidelines could induce designers to form ideas for potentially services or products that could prevent the stresses beforehand and heal the graduate students’ mental health problems before it gets degenerated.

REFERENCES

- Assembly, G. (2014), *Graduate Student Happiness and Well-Being Report*. Berkeley, CA.
- Chan, J.K., Farrer, L.M., Gulliver, A., Bennett, K. and Griffiths, K.M. (2016), “University students’ views on the perceived benefits and drawbacks of seeking help for mental health problems on the Internet: a qualitative study”, *Jmir Human Factors*, Vol. 3 No. 1, p. e3.
- Chung, S.K. and Kim, C.G. (2010), “Influences of depression, stress, and self-efficacy on the addiction of cell phone use among university students”, *Korean Journal of Adult Nursing*, Vol. 22 No. 1, pp. 41–50.
- Evans, T.M., Bira, L., Gastelum, J.B., Weiss, L.T. and Vanderford, N.L. (2018), “Evidence for a mental health crisis in graduate education”, *Nature Biotechnology*, Vol. 36 No. 3, p. 282.
- Gewin, V. (2012), “Mental health: Under a cloud”, *Nature*, Vol. 490 No. 7419, pp. 299–301.
- Hyun, J., Quinn, B., Madon, T. and Lustig, S. (2007), “Mental health need, awareness, and use of counseling services among international graduate students”, *Journal of American College Health*, Vol. 56 No. 2, pp. 109–118.
- Hyun, J.K., Quinn, B.C., Madon, T. and Lustig, S. (2006), “Graduate student mental health: Needs assessment and utilization of counseling services”, *Journal of College Student Development*, Vol. 47 No. 3, pp. 247–266.
- Korean Educational Development Institute. (1992), *The Synthetic Understanding of Korean Education and Future Plans (Vol. III)*. Author, Seoul.
- Kinman, G. (2001), “Pressure points: A review of research on stressors and strains in UK academics”, *Educational Psychology*, Vol. 21 No. 4, pp. 473–492.
- Lee, K. and Hong, H. (2017, June), “Designing for self-tracking of emotion and experience with tangible modality”, In *Proceedings of the 2017 Conference on Designing Interactive Systems* (pp. 465–475). ACM.
- Lee, J.K. (2006), “Educational fever and south korean higher education”, *Online Submission*, Vol. 8 No. 1.
- Levin, M.E., Haeger, J.A., Pierce, B.G. and Twohig, M.P. (2017), “Web-based acceptance and commitment therapy for mental health problems in college students: A randomized controlled trial”, *Behavior Modification*, Vol. 41 No. 1, pp. 141–162.
- McGuinness, T.M. and Ahern, N.R. (2009), “Risky behavior of adolescent college students”, *Journal of Psychosocial Nursing and Mental Health Services*, Vol. 47 No. 4, pp. 21–25.
- Mori, S.C. (2000), “Addressing the mental health concerns of international students”, *Journal of Counseling & Development*, Vol. 78 No. 2, pp. 137–144.
- O’Leary, K., Bhattacharya, A., Munson, S.A., Wobbrock, J.O. and Pratt, W. (2017, February), “Design opportunities for mental health peer support technologies”, In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing* (pp. 1470–1484). ACM.
- Raunic, A. and Xenos, S. (2008), “University counselling service utilisation by local and international students and user characteristics: A review”, *International Journal for the Advancement of Counselling*, Vol 30 No. 4, pp. 262–267.
- Smith, E., Brooks, Z. (2015), *Graduate Student Mental Health*. University of Arizona.
- Song, Y. and Lindquist, R. (2015), “Effects of mindfulness-based stress reduction on depression, anxiety, stress and mindfulness in Korean nursing students”, *Nurse Education Today*, Vol. 35 No. 1, pp. 86–90.
- Sorensen, C.W. (1994), “Success and education in South Korea”, *Comparative Education Review*, Vol. 38 No. 1, pp. 10–35.
- Times (2018), *Asian University Rankings 2018*. Retrieved from https://www.timeshighereducation.com/world-university-rankings/2018/regional-ranking#!/page/0/length/25/sort_by/rank/sort_order/asc/cols/stats

ACKNOWLEDGEMENT

This work was supported by the ‘Promotion of Graduate School of Creative Design Engineering’ of the Korea Institute of Design Promotion with a grant from the Ministry of the Trade, Industry & Energy, Republic of Korea. (N0001436)