Immersive Micro- Vacations for Stress and Anxiety Management

(Technical Paper)

Universities Implement New Technologies to Help Monitor and Treat Depression

(STS Paper)

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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General Research Problem: Ensuring that Resources Exist for Mental Illness Across Different Environments and Demographics

What are the social implications surrounding mental illness and how can technologies that help adequately manage mental illnesses be implemented across all types of environments?

Over 450 million people worldwide are affected by mental illness ("WHO | Mental disorders affect one in four people," 2001, n.p.). The way mental illness is addressed and treated changes among different environments and demographics. For example, for workplace environments, new products are being studied and implemented to help reduce stress and anxiety in the workplace, but there tends to be less resources like these at universities. One of these new products, as described before, is being studied and tested in my capstone project. This project explores how stress and anxiety can be managed and reduced in the workplace through immersive micro-vacations in virtual reality booths. The technology is specifically being produced for adults in the workplace, so for my STS topic, I want to research mental illness among a different demographic. I will investigate how depression and anxiety affect students attending top tier universities in the United States, the reasons that new technologies that effectively address and manage mental illnesses are being created, and the social and decision-making processes behind producing and employing these new technologies. I want to understand what the decision makers are trying to do as they create and use technologies to provide treatment for mental illnesses at their universities. This will give insight into understanding the need for and importance of healthcare and resources for mental illness for all people. The capstone and STS research topics are connected because resources are now being studied and

provided in work environments to help reduce and control stress and anxiety, but these resources are less plentiful at most universities.

(Technical) Virtual Reality as a Resource for Anxiety Management in the Workplace

How can virtual reality micro-vacations in various settings of nature help to reduce anxiety and stress in the workplace?

Studies show that 42% of employees report feeling stressed at work. However, a much smaller portion of employees (~22%), report being able to cope with stress very well (Colligan & Higgins, 2006, 94). Many people in the workplace struggle to manage their stress on a regular basis, thus impeding productivity and overall workplace satisfaction. Given this situation, many employees cannot depend on their own capabilities and instead require some external aid to help reduce stress and increase productivity. Therefore, a solution that would reduce workplace stress and increase productivity would appeal to both employees and employers.

My technical research problem (capstone project) will explore a combination of Attention Restoration Theory and virtual reality (VR) technology as a novel therapy for short- and long-term stress reduction and anxiety management. Attention Restoration Theory is the theory that nature will restore the ability to concentrate, thus reducing stress and anxiety and promoting productivity (Ohly et al., 2016, 305). Previous evidence of data, such as hormone and stress level tests, supports that VR environments can be successful in reducing anxiety (Gorini & Riva, 2008, n.p.). Traditional treatments for stress and anxiety include medications, therapy, or self-care

techniques such as meditation. However, these treatments may be expensive and time consuming, and are not quick outlets for everyday stressors in the workplace, such as running meetings and presentations. Readily accessible digital technologies, such as VR technology, are better suited for improving mental health in a workplace setting. This study is important and worth addressing because resources that are readily available to help with mental illness can help to manage and reduce the severity of symptoms.

As a broad overview, participants will undergo VR micro-vacations through a virtual reality program provided by Even Health that guides them through various settings in nature. Research for this study will include monitoring the physiological changes in patients and measuring the biometric indications of change attributed to the immersive experiences. More in depth, after giving informed consent, study participants, which will likely be University of Virginia Engineering graduate students, will complete a task prior to the experiment that induces minor stress or fatigue. Examples of such tasks might be a puzzle, math problem, or multi-tasking activity. The participants' data that measures stress will then be collected. Such metrics will be gathered through heart rate variability sensors, blood pressure gauges, and the measuring of galvanic skin response. This preliminary test will serve as baseline data to ultimately measure the efficacy of the therapy on participants. The participants will then be immersed in the VR booth for 5-8 minutes, where they will select a restorative environment of their choosing from 2-3 given options (i.e. beach, lake, mountaintop). Physiological changes in patients and biometric markers will be monitored and measured throughout the therapy. Afterwards, the participants' data will again be collected for comparison of pre- and post-stress levels. Likewise, a post-stimuli task will be given to measure and compare productivity. Possible independent variables

to change involve the use of a stool or chair, the use of VR or not, and variation of the VR scenarios. The project goal is to help individuals build emotional strength and better manage stress and anxiety in their lives through the implementation of innovative technologies in the workplace. Overall, this experiment will determine if virtual reality micro-vacations help to reduce stress and anxiety.

(STS) Can Top Tier Universities Transform Their Mental Illness Resources to Be Top Tier?

How are top-ranking universities thinking about mental health and what are the social conversations and processes behind addressing the issue and implementing new technologies for sufficiently treatment?

Introduction and Theoretical Framework

For my STS research paper, I will explore mental illness among college students attending top tier universities. The universities I will be studying include Stanford University, The University of Southern California, Yale University, and Harvard University. I have chosen these four schools because they are all top universities around the nation, but two are on the east coast and two are on the west coast. This will give insight into ideas coming from both sides of the country from what are considered the most brilliant universities. I will study how the actors at these universities, including students, inventors, and school authorities, respond to the crisis of mental health incidence in students on campuses and how their social responses lead to the creation of new policies and technologies that effectively address and manage mental illnesses. I

want to comprehend the social and decision-making processes behind producing and employing these new technologies and policies. Overall, the views and processes behind developing the new technologies and policies are important because it can change how mental illness in college students is managed and possibly treated.

Mental health disorders are extremely prevalent in higher education. As a result, there has been a great deal of press coverage and public attention surrounding several suicides which has fostered discussion of mental illness on campuses. Due to the attention and conversations, technologies have been developed and implemented at universities to make resources more accessible to students. With this, I want to understand how the public attention, continuous discussion of the consequences of not having available resources for managing mental illness for students, and the actions of inventors, school authorities, and students have led to the creation and implementation of these new technologies. There are several groups that work together to foster these changes, including the students themselves who speak out about mental health, the companies that create new technologies, and the mental health professionals and services at universities that are convened to talk about change for mental healthcare for college students and to make those changes by implementing these new technologies. Overall, I will study how these actors interact in order to socially construct new technological and social changes surrounding mental illness.

Background

As an overview, the number of students with mental illnesses has increased significantly over the years. In recent years, “in a survey of 274 institutions, 88 % of counseling center

directors reported an increase in “severe” psychological problems.” (Pedrelli, Nyer, Yeung, Zulauf, & Wilens, 2015, 503). Statistics show that 7 to 9% of college students suffer from depression, 11.9% have anxiety disorders, and in a survey of 8,155 students, 6.7 % reported suicidal ideation (Pedrelli et al., 2015, 504). Many of these students neglect to seek treatment or are not treated appropriately. “Approximately only half of the students with depression received adequate care” (Pedrelli et al., 2015, 507). For this reason, I want to research the conversations behind creating and implementing new technologies that will help to treat mental illness, even for those who do not seek out professional help. If this issue is not addressed and services on campuses are not knowledgeable about the mental illnesses that their students suffer from, the consequence could be the loss of more lives.

With these increased statistics of depression, anxiety, and suicide on college campuses, there has been a great deal of media coverage. For example, articles have been titled “College Students (And Their Parents) Face A Campus Mental Health 'Epidemic'” (Gross, 2019) , “The way universities are run is making us ill’: inside the student mental health crisis” (Shackle, 2019), and even “How Colleges Flunk Mental Health” (Baker, 2016). Following the many articles reporting on the astoundingly poor policies for accommodating students with mental health concerns, many universities have put into place new technologies, task forces, and summits focused on conversations about how to improve mental healthcare on campuses.

As a result of the public attention surrounding mental illnesses on campuses, schools have attended summits and created task forces to promote better ways to address mental illness. For example, a mental health summit took place this year, which included “a student

panel…[that] spoke to their experiences with enduring the stressors of life as a collegiate student-athlete" ("Ivy League and Patriot League Host Mental Health Summit to Kickstart Academic Year," 2019, n.p.). Discussions like these are a start to how change is being created. Also, last semester at Harvard University, the Office of the Provost assembled a task force for managing student mental health. The task force is currently exploring "how Harvard can best address the mix of academic, social, and institutional issues that have the potential to influence student mental health" (Herpich, 2019, n.p.). They also acknowledged that there are new technologies to help identify, manage, and overcome mental health difficulties. Harvard has already made some of these new technologies available to students, including online psych interventions for mental illnesses (Herpich, 2019, n.p.).

As mentioned previously, these events, task forces, and conversations have led to the implementation of new technologies and policies in order to provide additional resources to students. To combat the national crisis of increased mental illness of campuses, many colleges have made or partnered with companies that have made digital technologies with diagnostic and treatment capabilities. The transition into online or digital mental health services allows for patients, who are not ready to talk to therapists, get support while remaining anonymous. For example, Woebot is a chatbot that was created at Stanford University that addresses and manages depression and anxiety using a digital version of cognitive behavioral therapy (Garg & Glick, 2018, n.p.). Also, the University of Southern California's Institute for Creative Technologies built a digital resource to help students suffering from mental illness. This device is a virtual therapist named Ellie (Garg & Glick, 2018, n.p.). From a different perspective, a professor at Yale University is attempting to make annual mental health screenings of students mandatory.

Other universities have proposed observing their students' social media for content relating to mental illness (Morris, 2016, n.p.). The overwhelming question I want to answer here is: why are new technologies and policies being put into effect at workplaces and universities and what are inventors/actors trying to do by creating and implementing these solutions?

Data Collection

After studying how the actors at the chosen universities, including students, inventors, and school authorities, respond to the crisis of mental health incidence in students on campuses, I want to collect the following data: documents detailing the experiments and processes of creating the technologies, documents detailing policies allowing the technologies to be created and adopted by universities, and documents detailing interviews and public statements from the actors about their reasoning for creating the technologies and policies to see how the technologists and university administrators are thinking about mental illness. I will research the experiments behind developing these technologies to see how they are validated, and how the technology creators and universities are thinking about mental illness to grasp how the technologies were thought of as solutions. By collecting interviews and public statements, I will be able to address my questions about how the technology creators and universities that are adopting the technologies are thinking about mental illness in order to understand how the technologies were thought of as a solution. This is important to understand because solutions will be adapted to the way that the creators think about and view mental illness. I want to understand the technologists thought processes and gain insight into why their technologies were developed. I would also like to find interviews and public statements given by people on committees, such as the task force at Harvard University, to understand what they hope to accomplish by opening

up conversations relating to student mental illness. Overall, with this data, I am looking to answer the questions: what did it take to validate these new technologies and policies; what are the rules for creating and employing these changes and who governs them; what needs to be known about the technologies before it gets introduced to administrators as a tool; and how are institutions ultimately responding to the crisis of mental illness on campus and trying to combat it?

Methods

In order to answer the questions from above with the data I will collect, I will analyze my the data by looking into the discrepancies between the policies that are currently in place at universities and what the interviewees would like to change about these policies in order to understand their thought processes and the general direction that they would like to move in in terms of creating new policies and technologies for mental illness management. Through looking at these differences, I hope to gain insight into how society has shaped the current policies and technologies and how actors will create more change in the future. By the end of my project, I want to understand how actors interact socially to construct change for managing mental illness on campuses. With the knowledge of understanding these processes, universities will hopefully be more inclined to streamline making the policy and technological changes that are being discussed.

Overall Conclusion

Overall, I want to understand what the decision makers are trying to do as they create and use technologies to provide treatment for mental illnesses at their universities. This research and

my capstone project will give insight into understanding mental illness, how actors are approaching a way to manage it in different environments, and the importance of healthcare and resources for mental illness. The capstone project goal is to implement innovative technologies in the workplace that ultimately help individuals better manage stress and anxiety throughout their lives. My STS research should give insight into the reasoning and processes of creating these technologies for college students. I want to answer the questions: how are institutions responding to the crisis of mental health incidence in students, why are new technologies and policies being put into effect at workplaces and universities, and what are inventors/actors trying to do by creating and implementing these solutions? This research will hopefully lead to an understanding of treatment for people with mental illnesses.

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