Prospectus

Increasing Engagement and Decreasing Attrition in eHealth Interventions

(Technical Report)

From Inception to Completion: the Implications of Physical Space Design with Respect to Diversity

(STS Research Paper)

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Introduction

For my Capstone, my team will implement and evaluate new approaches to engaging participants in an existing mental health intervention called MindTrails, which trains anxious individuals to think in less threatening ways. These new techniques are focused on personal goal-setting and scenario personalization to improve engagement and relevance to each participant's unique daily life patterns. By researching and designing how Implementation Intentions will be utilized in the project, we will assess our updated techniques in a small sample to evaluate the efficacy of these new approaches.

For my STS Thesis, my group project's goal is to discover how the design and architecture of a room affects who uses it, with the goal of increasing the mental and physical comfort of students to enhance academic curiosity. I will focus on how powder dynamics and hegemonic design of a space may hinder the experience that visitors of a minority background would have.

Technical Topic

Anxiety and other mental health problems are common. About 1 in 5 adults (roughly 47.6 million people) in the United States have been diagnosed with some form of mental illness, but less than half (43.3%) received treatment this past year (NAMI, 2019, p.1). The disparity between those who need treatment and those who actually receive it is due to barriers created by societal stigmatization, lack of readily available resources, cost of service, unavailability of insurance coverage, lack of motivation, and mistrust of psychologists and other mental health professionals (Harvey & Gumport, 2015). Although eHealth and mHealth interventions have

increased access to interventions, these programs often fail to retain users throughout the course of treatment. To improve retention and user engagement in online interventions, further research and development must strive to create optimal treatment and engagement experiences in order to retain participants for the duration of the study.

MindTrails is an online intervention program that uses cognitive bias modification (CBM) to alter negative interpretations of situations and stimuli by participants with anxiety. In order to aid participants in imagining themselves in the scenarios, they are asked to place themselves in a given scenario, think about their emotional experience in that situation, and rate their anxiety. Then, individuals are required to read an emotionally ambiguous scenario and to resolve the ambiguity by filling in the missing letter of a word fragment at the end of the scenario. The intervention consists of five levels of training sessions with a mandatory five-day break between each session.

MindTrails currently faces high rates of attrition, in part due to lack of personalization (i.e.

presenting the same scenarios to every user). The program is currently being redesigned, with the ultimate goal of personalizing the training scenarios and increasing engagement. Personalizing scenarios could reduce the rate of attrition by making the scenarios more relevant to the user and increasing the impact on the participant by centering the scenarios around situations in which they can more realistically imagine themselves. In addition, engagement will be increased by incorporating implementation intentions, or if-then statements that generalize the lessons of specific scenarios, and by actively encouraging goal setting by users. The implementation intentions and goal setting could allow participants to understand how to apply the training to their daily lives.

My capstone team will split into two subgroups; one subgroup will implement the personalization of scenarios, and the other will implement the implementation intentions and

goal setting. Both groups will research ways to implement the two techniques and eventually wireframe and code them into the MindTrails interface. The primary goal is to help the MindTrails team eventually integrate personalized scenarios and design ideas backed by literature and case studies. Psychology will develop the personalized scenarios and implementation intentions, and the capstone team will incorporate them into the design. Although actual implementation on the MindTrails platform is ideal, this step may not be completed by the capstone subgroups themselves, but rather by another developer on the project. Furthermore, testing the effectiveness of these new features is not within the scope of the capstone project but may be conducted if time permits.

The current idea for my sub-team, implementation intentions, includes producing a wireframe. A wireframe would show how the if-then statements that make up the implementation intentions will be presented to the user and how goal-setting features will be added to the current MindTrails interface. Studies have shown that when implementation intentions are included in mental health interventions, participants are more likely to act on the goals they set for themselves (Gollwitzer, 1999). Implementation intentions are constructed as "if, then" statements related to participants' goals. For example, if a patient has identified that their goal is to maintain friendships, an implementation intention could be framed as, "If I see my friend, I will ask them to get coffee." The implementation intentions will potentially be included in the MindTrails treatment through a partnership with the CS team and written in ReactNative.

STS Thesis

Back in 2016, the Center for Diversity (CDE) at the University of Virginia used to be a dim, cubicle filled room. For my work study as an inexperienced first year, I would permit the occasional student to print documents on a desktop that sat next to me.There were about 30 students who signed in to use the office's resources in that fall semester of 2016, a great contrast

to the already over 3,700 visits to the Center for Diversity in Engineering for the fall semester of 2019, and that number is only going to grow exponentially. Right next door, what used to be a graduate student lab is being converted into a new, open and mindful space as an extension of the office that is being quickly outgrown by its inhabitants. This institution, the CDE, has existed for over 20 years at the University, so why is it only during my four years at UVA that it has grown so much? There is an explanation for how this implemented change occurred- the design of a space, from its intended audience, to its physical design has a vast impact on how it is being used.

The purpose that a room retains, from its inception to its completion, has a profound influence on the way its visitors will interact with it. The design of these spaces can greatly affect the experience that diverse students have with the physical design of it, and with the interactions they have between each other. I intend to create a space that encourages people to think deeper about the biases that are superimposed on others, especially as a form of power that is imposed by the confines of a physical space. This project intends to explore the interactions between underrepresented populations and the spaces that they inhabit by highlighting how a space's design affects its use. I will uncover the hidden nuances of what creates an inclusive and collaborative space that encourages a diverse audience through the following research questions : How does space reconfigure power among diverse social groups? How do the power dynamics instilled by a room's designers impact targeted user that could lead to exclusion or invisible discrimination? What design should be implemented in a shared student working space to induce more inclusive, diverse participation?

Already, the University of Virginia have decided upon an approach that utilizes the concept of "Contemplation" for the purpose of recruiting diverse populations to their spaces. Contemplation, defined as "the variety of experiential, integrated, and immersive forms of learning and resiliency that afford deep reflection, integration of the personal and the

intellectual, transformative understanding, and the cultivation of skills applicable to all domains in one's life" ("Mission," 2019), is incredibly useful for "improving mental and physical health, and can also contribute to improvement in other areas of personal development" (Bruce, Skrine Jeffers, King Robinson, & Norris, 2018). However, there are barriers that can prevent this ideology from penetrating a space's users. Before this ideology can be incorporated into a space's design, one needs to understand the social origins that contribute to the invisible power relationship instilled by a space. Thus, as contemplation could be a remedy that helps visitors understand the unequal hidden powers carried on others, I intend to unfold just what those power dynamics are.

Literature Review

The stakeholders who decide on the policy and design of a space intrinsically determine its user group, which can lead to dissonance between a room's intended and actual user. A crucial component in the creation and shaping of public spaces are those tasked with ensuring a space's completion. This user group, which is comprised of the space's designers, policy makers, and producers, retain a role that manifests itself in a multitude of ways. As explained by Matthew Carmona for principles of space design, " planners are often the initiators of public space projects" (2019) , and recognize "the need and potential for new or regenerated public spaces in particular locations" (Carmona, 2019). They also retain the privilege of deciding how public spaces come into being through "processes of development management" which grant or deny a space permission to develop (Carmona, 2019). Thus, the design policy that comes with a space can supply messages about what it is supposed to do, which target users are deserving or not, and what participation patterns are appropriate for the space.

However, different target audiences receive vastly differing messages (Schneider & Ingram, 1993) , and because officials develop maps of target populations based on both the

stereotypes they themselves hold and those they believe to prevail (Schneider & Ingram, 1993), they use their skills, often with good intentions and 'best practices,' toward results that may not align with what is needed or wanted in a given context. One such result of this is the design of a space creates a power dynamic which may discourage users of certain backgrounds to use it. In designing public spaces, it is important to consider the desired social outcomes and how the physical space and its context will or will not support its users. Public space architects don't understand how certain groups are more advantaged more than others "independently of traditional notions of political power and how policy designs can reinforce or alter such advantages" (Schneider & Ingram, 1993). The design of a space has more implications than most entering may be aware of, but those of historically underrepresented backgrounds may be cognizant of nuances in design and policy that keeps them from returning.

Different cultural groups display "varying patterns of use in public spaces [as] the result of differences in cultural values attached to a space or activity, not merely differences in access" ("Making Multicultural Places", n.d.). It is the target users, or the people that make the spaces what they are. One entity alone cannot hope to capture the needs of a target group, thus there exists a need for those designing spaces to enlist the help of target users to design such spaces. There is a methodology, Participatory Action Research, which leverages the idea that creating knowledge "is rooted in the belief that those most impacted by research should take the lead in framing the questions, design, methods, analysis; and determining what products and actions might be the most useful in effecting change"(PAR-Map, 2009). The input of a user group is essential to a space's success. When a space isn't originally built for the use of a certain group, it can be a challenge for the mental and emotional conversion of its users to follow its physical change. Research suggests that "effective regeneration of spaces require a sophisticated understanding of and engagement with users and potential users (Holland, Clark, Katz, & Peace, 2007), particularly those who are local and will be most involved in space creation. By asking

the typically untapped users– underrepresented visitors- what their necessities for authentic spaces are, designers can create the opportunity to create spaces of greater potential. Therefore, a starting point from which to develop practices that may realize some of the rhetoric of policy" (Holland et al., 2007), may be to understand the social interactions between people within urban public spaces by remaining in contact with them during a space's inception.

Contemplative practices can potentially address disparities in participation because they can be utilized in culturally meaningful ways at low to no cost. Contemplative practices provide a vessel for the empowerment of people who are disadvantaged, marginalized, or under resourced to respond to the stresses that surround them (e.g., racism, poverty) in ways that serve their spiritual, emotional, mental, and physical health needs (Bruce et al., 2018). However, mindfulness has not been widely embraced outside of the community of predominantly white hegemonic audience. This is because the ideologies associated with contemplation "bear little resemblance to the daily lived experience of many historically oppressed, marginalized, minority-status, and/or stigmatized (HOMMS) people of color and can be perceived as irrelevant and unconcerned with their circumstances (Harrell, 2018).

Discussion and Next Steps

In order to discover why this disparity occurs and to find a remedy for it, I have been interviewing key stakeholders in the multicultural student centers of the University of Virginia. The input from those involved in the design of new spaces are being compared to those in charge of places being converted to cater to "underrepresented" individuals, who serve as though ultimately designing the spaces (the architect group). This architect group includes the faculty that run student aimed spaces, and also contribute to the design and maintenance of them. I am also documenting the responses of students who utilize these spaces to gauge their input on contemplation and what a truly successful student space looks like (end user). This varies from

students who thoroughly use the studied student spaces and those who have little to no experience with them. By capturing the key stakeholder's insights, I will be able to comprehensively study of the components that create a collaborative space based on the definitions and specifications of a diverse population. I will also be able to gather evidence from real sources of how the spaces dynamics affect them.

I will also be conducting a comparative analysis of several spaces through the use of Participatory Action Research. By observing and working directly with the visitors of the Center for Diversity in Engineering, the Multicultural Student Center, and the upcoming Latinx Student Center. I chose to compare these different sites due to their similar goals despite catering to different populations, which will hopefully reveal similarities that are necessary for all spaces to be successful. The Latinx Student Center is still being built, with students participating in the board directing the design decisions, so it will provide a perspective unique to one being built specifically for an underrepresented group.

A 'successful' multicultural environment is one where various group's sense of comfort is combined with good physical design to create an atmosphere that can nurture many preferences; a place that fosters social interaction while simultaneously creating distinct "spaces" where individual cultures can be emphasized and celebrated ("Making Multicultural Places", 2009). There has been an unprecedented opposition to contemplation within underrepresented groups, despite there being evidence that contemplation can be the vessel for which these groups to flourish. When finished, I hope to bring my evidence to those designing the new Contemplative Student Center so that the same barriers detailed above can be avoided, and the resulting space can be resonant with all audiences.

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