

Team 04

Dr. Joy Harris

GT 2803

22 September 2021

## Global Leadership SDG 4 Project

### **Introduction**

Currently, the United States maintains the largest overseas military presence, with over 170,000 active military duty personnel stationed around the world as of March 2021 (“US Global Force Posture and US Military Operations Short of War.”). Since 9/11 alone, over 2.77 million service members have been deployed by the United States government (McCarthy). Despite the large numbers of Americans choosing to fight for their country every day, mental health education has been inadequate for those choosing to participate in active deployment.

### **A Comprehensive Summary of the Issue Being Addressed**

As of 2018, an average of 17.6 veterans commit suicide every day (“2020 National Veteran Suicide Prevention Annual Report.”). While the Veterans Affairs department (VA) does offer benefits to those that have been deployed, more than half of all veterans find access to the VA’s resources difficult (Jones). The alarmingly high suicide rates of veterans and lack of easy access to the VA’s resources demonstrate a greater need for mental health education reform and community support.

Through this project, we aim to enhance veteran mental health education by exposing soldiers to potentially disturbing scenarios prior to deployment and equipping them with tools to cope with their experiences as they happen during deployment. Using Virtual Reality (VR)

technology to simulate real war-zone experiences will help to prepare soldiers for the potentially triggering scenes they may witness overseas. This exposure coupled with a veteran-led group discussion will help foster an inclusive and supportive environment for military personnel as they enter into the military. Mental health outcomes for veterans may significantly improve with the interactive learning that VR provides.

### **The Target Community**

United States veterans, both active duty and discharged, continue to suffer from immense mental health challenges. Veteran mental health education reform is needed as a lack of mental health knowledge can lead to self-harm and suicide.

Between 11 and 20 percent of veterans who deployed in Operations Iraqi Freedom and Enduring Freedom had suffered from post-traumatic stress disorder (PTSD). PTSD is most commonly associated with combat trauma as soldiers are often exposed to scarring experiences in the battlefield (*Posttraumatic Stress Disorder (PTSD)*). These scarring experiences could range from observed violence on the battlefield to the moral injury of killing an enemy soldier. PTSD symptoms include relieving the stress and trauma of battlefield flashbacks, problems sleeping, and even drug and alcohol abuse. In 2017, reckless and self-destructive behaviors (RSDB) were added as a symptom to the DSM5 as more veterans engaged in RSDB (Lusk). Behaviors classified as RSDB include substance, self-harm, and aggression. Because of its damaging self-symptoms, mental health education programs must effectively address PTSD in veterans.

Military personnel also experience higher rates of depression compared to the civilian population. Depression was found to be the most common mental disorder in veterans, with

13.5% found to be diagnosed compared to 9.3% for PTSD (Trivedi). With 7.1% of all U.S. adults experiencing depression, depression disproportionately occurs in veterans (“Major Depression.”). People with depression have thoughts of hopelessness, and these thoughts can lead to thoughts of suicide. In 2018, an average of 17.6 veterans commit suicide every day. Compared to the general population, veterans had a suicide rate 1.5 times higher (“2019 National Veteran Suicide Prevention Annual Report.”).

Effective mental health education is paramount with veterans harming themselves and losing their lives due to their mental disorders. A lack of knowledge about the signs of PTSD was found to be a major cause of veterans not seeking the treatment they need (“Study Explores Reasons Why Veterans Seek—or Don't Seek—PTSD Care.”). Education about the signs is essential for veterans’ mental well-being as veterans themselves must consult with mental health resources before their mental disorders reach severe levels.

To make the knowledge of mental disorders more memorable for veterans, a more active approach to mental health education should be adopted. Course content involving activities has been found to be most recalled by learners (Cherney). Veterans themselves can engage in activities teaching mental health, and consequently, long-term recall of disorder signs would improve. Long-term recall of mental health concepts and strategies would address the yearlong persistence of common disorders such as PTSD in veterans and ensure long-term mental well-being.

The need for veteran mental health education reform and the outcomes of active learning leads to our Virtual Reality-based mental health education program.

## **An Overview of the Solution**

*Before the Course:* Our solution begins once a soldier is notified that they are scheduled for deployment. The soldier will receive information promoting our program and describing its potential benefits. If interested, there is a short application process that takes into account the location of deployment, type of deployment (combat, medical, office, etc), the applicant's history with mental health, and a few other factors. Ideally, the program will have the capacity to accept everyone. The application is mainly used to tailor the service to the specific needs of the client. Once accepted into the program, the soldier will be mailed a VR headset and asked to complete a survey containing a few more details about their upcoming mission. Our precoded algorithm will analyze their survey responses to further customize the course for what the client is likely to experience in the field. The headset itself is the only physical component of the program as the course content and simulation will be virtual. The client can read on the website provided with the headset instructions about how to set up the headset and prepare for the course.

*The Course:* The course itself will consist of three parts:

1. Preview videos guiding the client into the right headspace for what they are about to see, and explaining the goals and concepts behind the course.
2. The simulations, in which the client is immersed in as realistic as possible, potentially traumatizing situations that they could potentially encounter on the field.
3. Debriefing exercises in which the client reflects on how they felt during these simulations, and videos teaching them strategies on how to best cope with these types of experiences in real life.

The program has an additional feature that allows clients to meet virtually with veterans to discuss their experience in the course, and ask them any questions — such as how they dealt with their own traumatic experiences.

### **The Technology used to Implement the Solution (Parth)**

VR already has demonstrated strong utility in treating mental health outcomes for veterans. In 1997, researchers from Georgia Tech linked exposure therapy with Virtual Reality. In this study, ten volunteers, veterans suffering from PTSD who had not responded to multiple treatments, signed up for the pioneering Virtual Vietnam clinical trial. Each was given a VR headset and transported to either a jungle clearing or a Huey helicopter passenger seat. A therapist then manipulated the sights and sounds in crude ways while each patient told of their trauma. After a month's treatment, all ten patients' conditions improved significantly (Parkin). For a long time, it has been proven that Virtual Reality can help in simulating life-like environments which could help its users explore situations they may experience only once in a lifetime.

This project uses Virtual Reality to create such simulated environments and situations for the veterans and prepare them for the devastating and traumatic events they might face during their deployment. They are taught how to react with and mentally cope in environments such as war zones or combat areas. Once the user puts on a headset, they are transported to a virtual world simulating real-world events (ex. Vietnam War or 9/11). They then experience what it's like to see devastation around them as if they were there. After the simulation, a virtual instructor then instructs them on appropriate reactions and self-calming strategies.

By immersing future veterans into virtual environments simulating real, traumatic situations, VR becomes the ideal solution to resolve the mental health challenges of future veterans.

As technology progresses, VR is not only becoming cheaper but also improving (“Headset Technology Is Cheaper and Better than Ever.”). VR’s relatively cheap costs are making it a more viable option in terms of mental health education. Moreover, Virtual Reality is already being used for general medical and military simulations. Both VR’s cheap costs and existing prevalence in medicine and the military allow VR’s integration with mental health education to have the most positive impact.

### **The Potential Impact of the Solution**

*Minimized Cost:* VR’s low cost and current use in mental health allows our solution to minimize potential hurdles regarding the implementation of our solution. Virtual Reality headsets have recently been introduced in the medical field for the purposes of treating mental health. It is also projected that as the prices of these technologies continue to fall, VR will become a more widely accessible and useful treatment option. Dr. Albert Rizzo, the Director of Medical Virtual Reality at USC’s Institute for Creative Technologies, states that the VR adopters are “not eliminating the need for well-trained clinicians”. Instead, they are “giving clinicians tools to extend their skills” and acknowledging that “technology doesn’t fix anyone”. Virtual reality will simply be “a tool in the hands of a well-trained clinician” (“VR In Therapy: VR’s Positive Impact On Mental Health.”). As VR is already in use by mental health professionals, mental health professionals that would be employed for our project will likely have familiarity with VR technology. The market size for these VR-familiar mental health professionals will be sufficient enough for us to reduce cost and allow our course to be relatively cheap to maintain. As a result, the potential financial hurdles that could have been caused by high overhead costs are now resolved. The following positive impacts of our solution then adopt a greater focus.

As stated before, VR has been discovered to lower the patient's level of stress over time by exposing the patient to the source of their trauma repeatedly (Srivastava). When the efficacy of VR on PTSD was tested, it was found that a "6-month follow-up on patients found reductions in PTSD symptoms ranging from 15 to 67%" (Srivastava). However, our solution instead exposes future veterans to events that might cause trauma. Our preventive and more educational approach to the combination of VR and mental health allows all veterans to be thoughtful for their mental health. Instead of treating severe PTSD when it happens, the coping strategies that our instructors will provide to veterans will potentially prevent such severe PTSD from happening. With potentially less severe PTSD cases in veterans, there could be less strain on VA resources. Access to mental health resources can therefore be improved, and other disorders, such as depression, can be treated to prevent veteran suicide.

## **Conclusion**

In terms of UN Sustainable Goal 4, our solution helps advance Target 4.4, especially in "relevant skills". The coping mechanisms taught in our VR-based mental health curriculum prevent mental-related employability issues, and as a result, veterans are more capable of dealing with their mental health challenges at the job. Our project's interactive learning and its virtual access advance Target 4.A as well as VR ensures "safe, non-violent, inclusive, and effective learning environments". Through the simulations of VR, veterans are able to be assessed for mental disorders without experiencing actual violence and trauma on the battlefield. All military personnel would be eligible for the course, making our course safe and inclusive for veterans.

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