**Background Information**

“One in four people in the world will be affected by mental or neurological disorders at some point in their lives [10:1].” This makes mental health one of the leading health issues worldwide. Less than one in three of those affected by mental or neurological disorders receive treatment. Reasons contributing to the lack of mental health treatment include cost, availability, and social shame [10].

In addition, the historical evolution of mental health treatment includes shunning lunatics, to instituting insane asylums, to providing isolated therapy sessions. Media have associated this history and present methods of mental health treatment with horror and peculiarity. This association by the media has resulted in the widespread negative connotation of having and being treated for mental illness. This negative connotation cannot be ignored, and therefore, requires mental health treatment to evolve into a system that is affordable, available, and socially accepted.

Concerning mental health treatment, *psychotherapy* is the treatment of unhealthy mental states using psychological means. Researchers have considered virtual reality and its effects in administering psychotherapy [1][2][3][4]. Their findings vary, but agree virtual reality has a positive effect. In addition, [5] and [6] raise concerns and refinements that should be resolved for general acceptance of virtual reality. Finally, [7] defines implementation of virtual reality in non-gaming simulations.

Virtual reality therapy has been shown to be successful in reducing fear of public speaking [1], fear of heights [2], meditation [3], and mental stress reduction [4]. Phobias and their treatment are popular domains of research within virtual reality. Exposure therapy, where the object or situation that causes fear is present in a controlled environment, is a traditional fear reduction technique. [8] compares traditional methods of fear treatment and virtual reality. Virtual reality allows a completely controlled environment and does not require any physical presence of the fear stimulant.

Additionally, [9] discuss future applications of virtual reality to meet the mental health needs of crew members on extended duration space missions. Possible problems encountered in space are similar to those in other extended duration solitary situations. These types of situations are discussed as being treatable by simulated social interactions, crew team mental exercises, and other Earth environments. Virtual reality is suggested as a plausible system for maintaining mental health.

Considering other problems in providing virtual reality therapy systems, [5] identifies reasons for potential opposition from the general public. Virtual reality designers can create extremely realistic and immersive environments (using sound and in some cases touch). This type of immersion can create motion sickness, disorientation that may cause injury, or cause damaging psychological impressions.

Another concern [5] identifies is the amount of personal data that could be collected in a virtual reality experience. Motion tracking systems that are required for such immersive virtual experiences may be considered a breach of personal privacy. Invasion of personal privacy could reduce the general acceptance of virtual reality systems. This concern will influence whether future regulations of virtual reality systems will be government regulated or regulated by customer reviews.

Moreover, [6] identifies refinements and additional work needed for virtual reality therapy systems to be widely accepted. Phobia treatment programs need to be made more diverse so as to include environments that will satisfy the most general phobias, but still be customizable to the patients. Virtual reality environments must best suit the condition to which it is targeted using all available senses. Clinical population studies must be documented and comparative evaluations of traditional therapy methods.

Finally, [7] shows the implementation of virtual reality for non-gaming simulations is valid. A *game engine* is a set of software components that includes the required elements to make a computer game. Game engines are of interest to non-gaming organizations like NASA, Disney, and car companies for product research and development. The interest from non-gaming organizations stems from the increase in computing power available and the versatility of game engines. *Unreal* and *Unity* are examples of game engines with such versatility.

The quality and affordability of game engines now put them in the forefront of many major films. The realistic animations and special effects continue to become nearly indiscernible from actual live footage. Animations used to be extremely expensive for film companies, but with the emergence of game engines, animation is now a staple of the movie industry [7]. Furthermore, virtual reality systems using game engines will become a staple of similar industries because of their lifelike immersion [5].

Concluding, the research performed by [1][2][3][4] adequately describes the work being done to implement virtual reality as a means of therapy. The future of virtual reality is widespread and will become a common solution for various problems in various fields. Virtual reality’s application is proven by [5][6][9][13] where [7] states an industry game engine can be used non-gaming pursuits. Virtual reality is fully capable of a socially acceptable, low-cost, available system for psychotherapy treatment.