



Review Article

Virtual Reality for Combating Social Awkwardness in Special Needs

Sophia Rahaman, Zakia Ansari, Pooja Biswas*, Sogra Bilal Memon

Abstract

Social awkwardness remains one of the main factors which employers consider when hiring an employee. Current research shows that the percentage of employment for people with special needs is extremely low. One of the reasons identified by employers is these people lack social skills. Though people with special needs have proven to be good employees their inability to adapt to a change in social settings hinders their employment as these skills are highly important in the workplace. The people with special needs who are determined to acquire skills despite the challenges they may face are referred to the People of Determination (POD). With focused training these vital skills for the workplace can be enhanced. An approach that is widely used for training in several industries, is also a blooming factor in the computing field, is the use of virtual reality for multiple therapeutic, recreational, educative purposes. Virtual reality providing a simulated environment that could be used for training people with special needs by exposing them which to a simulated version of the workplace they will be working at. This will help them overcome social awkwardness as they would become more comfortable with the workplace environment.

Keywords

Special needs; Social awkwardness; Virtual reality; Simulated environment

Introduction

According to the data published by news agencies there are about 9,869 emirati nationals and 5,913 expatriates with some form of disability in the United Arab Emirates. Disability can be of several types including degrees of visual, hearing, physical, intellectual impairment as well as conditions like autism and in some cases multiple disabilities. There are multiple centers located in every emirate of UAE which caters to the training and facilities to the needs of the disabled people. The UAE government is introducing policies to bring about innovation to help these people integrate into society. It includes them spending time in the centers, learning new things, training on specific areas. There are assigned experts for different things which are taught to these individuals in the centers. In addition, they are given training to take up employment after attaining the employable age. These individuals have shown good employable skills and many employers do consider employing people with disability.

However, people with disabilities have shown a very high rate of social awkwardness. In spite of being well skilled for the job, they may lose it to another candidate due to social awkwardness. It is necessary to expose them socially during their training sessions, which would enable them to enhance on their social skills. Any work environment would require a person to interact with multiple people, clients and other employees. Employers have indicated a rise in anxiety level, low in confidence, inability to shake hands and in making eye contact are some of the factors that make them socially awkward which might in turn hamper their employment chances.

Virtual reality is a blooming sphere in the field of computing which enables a person to feel they are in a simulated environment where as they are actually not. It is being widely used for multiple therapeutic purposes, learning, treatments where the subject is exposed to the simulated environment. Virtual reality could prove to be an effective solution for learning as it opens the appropriate environment and also provide a platform to regularly analyze the improvement as per required in different cases. The subject is made to respond to the requirements of the simulated environment which could enhance the knowledge gain.

This is a pilot study that aims to identify if virtual reality applications can be an effective medium to help special needs acquire social skills that are required in the workplace as well as in daily life. Social skills are as important, if not more important than other skills in the workplace. Therefore, it is important to design tools for the special needs that help them grasp social skills more easily just as there are tools available to them for improving other skills. This is especially important as a special need may not be selected for a job despite having all the required skills, due to only the lack of social skills. In this study we first analyze the factor that affect the social behavior of people in different situations and hence identify situations where occurrence of socially awkward situations is common. For this study we have chosen to model one such situation into a Virtual Reality application. This study takes into consideration the design elements required to provide an immersive but comfortable experience, as well as measures the effectiveness of the application [1-5].

Motivation and Objective

The motivation of this project resonates with the objectives of the policies being implemented by the UAE government for Empower people of determination. This project aims to bring about innovation to the current training system in order to achieve enhanced equal opportunity, social inclusion and active participation for the people of determination. The people of determination tend to have difficulty integrating with society because they feel that they are different from others in certain ways as they have to go to special centers unlike their colleagues. This can cause self-doubt, low levels of self-esteem and a lack of confidence which in turn gives rise to social anxiety. Social anxiety can be of many forms whether it is a fear of public speaking, large crowds or of making eye contact during conversations. In such situations some people may have a nervous outbreak because of their social anxiety which can make them come across as socially awkward. Furthermore, their social awkwardness causes employers and their colleagues to doubt their ability and skills to carry out the job even though they have the required expertise they may not be trusted with

*Corresponding author: Pooja Biswas, Graduate, School of Engineering and IT, Manipal University, Dubai, UAE, E-mail: poojabiswas1010@gmail.com

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more important tasks. This clearly shows that they don't get equal opportunity as compared to their colleagues who have the same qualifications and skills. However, social skills can be enhanced just like any other skill. This paper assesses the effectiveness of Virtual Reality simulation as a tool for improving social skills which will allow the people of determination to have equal opportunity, feel a sense of social inclusion and active become participants in their workplace.

Traditionally those with special needs are trained by facilitators at special needs centers to stay calm in anxiety provoking situations by first visualizing that situation and then practicing certain breathing techniques to stay calm. However, the time spent by these individuals at these centers is limited and therefore it can take quite a lot of time to achieve the level of social skills required for a job. The Virtual Reality simulation aims to provide a safe place to practice social skills in a simulated work environment. This make it possible for people to train at home outside training centre hours and therefore supports the training given by the special needs center allowing them to acquire social skills faster and hence find a job [2,6].

Methodology

In order to help people, overcome social awkwardness a thorough understanding of the factors that cause social awkwardness is required. The prime factors that affect the level of social awkwardness in individuals include:

Self-Concept (SC)

The SC of an individual is one of the key factors that affect the level of social awkwardness in that individual. SC is a term used in psychology to describe an individual's perception about himself and what he thinks how others perceive him.

Confidence (Con)

Is an individual's belief that he/she can succeed. It is very

important to have a balanced level of confidence in the workplace. A low level of confidence is often a result of a low level of self-concept. People with low levels of confidence may not take up new opportunities in the fear of failure.

Adaptability (Adp)

Adp is another very important factor that affects the level of social awkwardness shown by an individual. Adp is the ability of an individual to adapt to new surroundings and to new people.

Figure 1 shows the link between self-concept, confidence and adaptability with the factors of improvement. An individual's social behavior is linked mainly to self-concept, confidence and adaptability. These remain the essential criteria to be worked upon to enhance social awkwardness. The facilitating factors would be to promote motivation and engagement, create positive and caring environment and encourage and facilitate socialization. Each factor mentioned is necessary to be carried out during the training given to the person with disability. Apart from the learning center, such factors need to be implemented at home too. Parents and facilitators play a key role in preparing a disabled person for employment. Activities focusing on social awkwardness are equally essential along with other required training facilities. Prime features required improving SC, Con and Adp are:

Approval (Appc)

Appc is the confidence the co-workers of a Person of special needs (PSN) have in his/her ability to carry out the tasks assigned. Such support can increase the SC and Con of the PSN.

Attention (Att)

Att is the attention employers should give their employees in terms of assigning them tasks as well as listening to their concerns to make sure they are comfortable with the work environment.

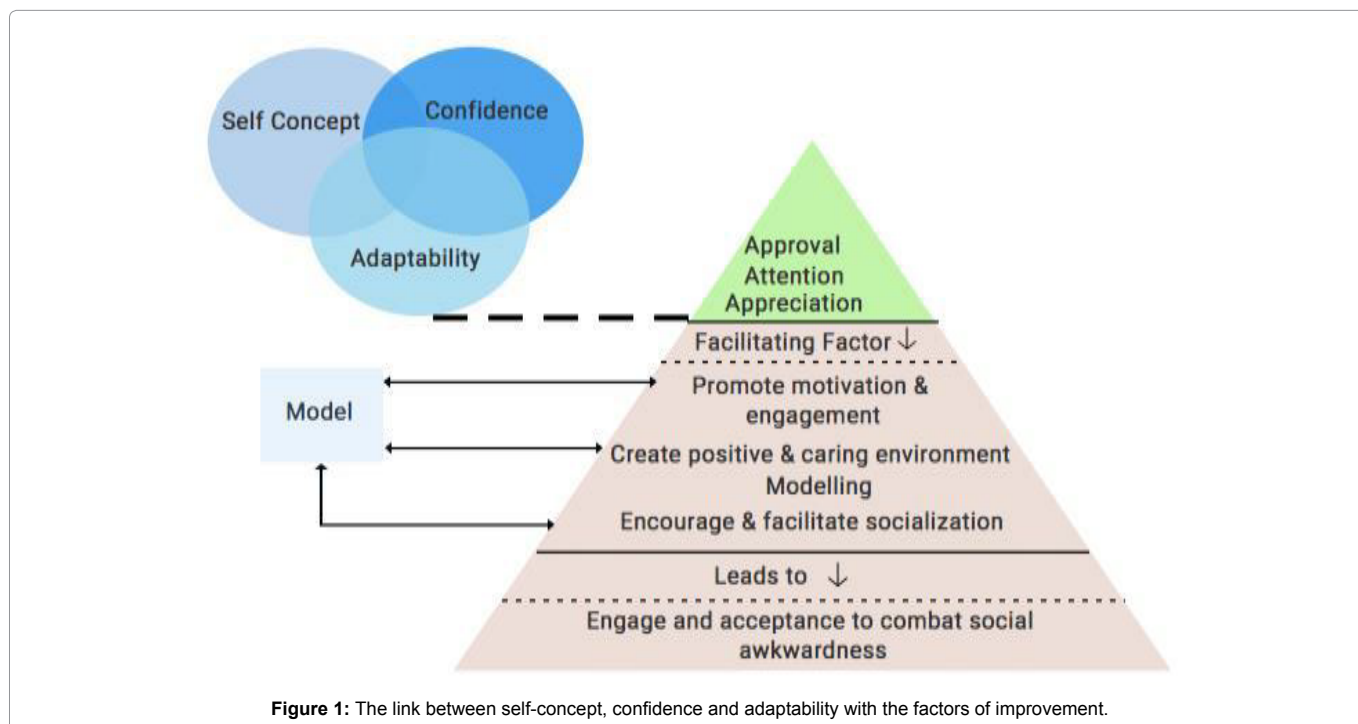


Figure 1: The link between self-concept, confidence and adaptability with the factors of improvement.

Appreciation (Appr)

Appr is one of the most important factors that need to be provided to increase levels of self-concept and confidence. Apr requires employers to acknowledge the employee's good performance either with some reward or even praise make the employee feel appreciated which would motivate him/her to perform even better.

Approval, attention and appreciation are some key features which are to be provided by the employer to motivate the employee. Improvement in social awkwardness would yield better social skills and hence better communication and comfort at work place. Social awkwardness is inversely proportional to self-concept. The higher the self-concept, the lesser the person would be socially awkward. Thus, with higher self-concept, the 3 A's, approval, attention and appreciation are more likely to be attained. Every employee needs the 3 A's to perform better, promote motivation and have a job satisfaction. Employee satisfaction and happiness would lead to better profits for the organization. Employers would be keener to provide opportunities to determined people with disabilities.

Each facilitating factor will be provided to the person in the form of a model. This model would comprise of situations similar to be encountered at work. Each facilitating factor connects to the model as the model contributes towards the goal of attaining higher self-concept. The model would play a major role. It is to be used regularly under supervision of facilitators or parents. The data recorded from this usage could be beneficial to monitor the progress bar. It is essential to introduce the model at an earlier stage to provide an appropriate duration for the model to start making a difference in the person's self-concept. Regular usage and monitoring are important to be carried out during the training. Effective usage of the model would help to combat social awkwardness. [7-9].

Discussion

The prime factors that affect the level of social awkwardness and the factors that are used to improve the level of social awkwardness which are discussed in the methodology are derived and confirmed in the following case studies.

Case Study 1: Virtual reality in cognitive behavioral therapy: a study on social anxiety disorder

This study was carried out in Switzerland at Departement Universitaire de Psychiatrie Adulte. The paper compiles research to suggest that Cognitive behavioral therapy (CBT) is the best treatment for social anxiety disorder (SAD). CBT comprises of therapy sessions where the patients are slowly exposed to social stimuli through a standard in vivo exposure. This study explores the possibility of using virtual reality applications as an alternative to traditional *in vivo* methods used in CBT. The study gathers information on previous case studies where VR has been used to overcome phobia. Such case studies include exposure therapy for the fear of flying, claustrophobic, acrophobic, VR exposure therapy has been successful in reducing the fear of heights, post-traumatic stress disorder, eating disorders, pain management, and in reducing n fear of spiders.

In this study two VR systems have been developed and tested. The first system models an office environment where the VR user has to ask a security guard for directions to the boss's office. He is given directions and enters an interview scene where he sits across a table in front of a virtual character who takes the interview. On modeling this scene, it was realized that many aspects of the scene like the realism

of the character's expressions had to be compromised. This lead them to develop a second scene which focused on the eyes of the virtual characters.

The second scene consists of a circle around the VR user. The circle consists of pictures of the eyes of different characters with different expressions. The number of these pictures can be controlled by the operator. Ten Computer Science students were exposed to this system and their stress levels were measured using a e bio-feedback device. This was followed by some relaxing music and then the stress results were measured again. It was found that the stress levels dropped in some individuals after listening to the music while in others it remained the same [2].

Case study 2: Tolerance of VR system by autistic children

It was a study conducted by North Carolina State University Computer Science and Computer Engineering Departments plus the staff and two families from the Division for the Treatment and Education of Autistic and other Communication Handicapped Children (TEACCH) at the University of North Carolina at Chapel Hill. The study focused on learning whether children with autism would adapt and respond to a virtual environment. The environment consisted of a road and the children were expected to learn how to cross it. The study took 6 months to be implemented and lasted for 5 weeks.

The subjects were children who were chosen on the basis of their prior computer knowledge, whose parents or guardians were ready to help with research, tests and reports from the time they were diagnosed for autism. The two subjects were named as S and R. The children were asked to spot the moving cars. Those cars were brightly colored. People were not included in the scene as they are hard to render. They were exposed to the system for 5 minutes as normal humans would start feeling uneasy after 20 minutes.

Challenges such as wearing of helmet were one of the major criteria. These children had to be wear the head gears. It was important to give them training and educating them about the gears before starting the experiment.

The results showed that both accepted the helmet for different durations. They immersed themselves completely to the virtual scenarios and started responding to the scenes. They accepted to wear the helmet more willingly. They also responded to colors and objects as accurately as possible. It was also observed that they were also comfortable to move around with the helmets on. This shows that people with special needs may accept the VR system under supervision and required training. [10]

The above case studies imply that empowerment through self-concept, enhancement of adaptability and boosting motivation and confidence for the people of special needs is very well achievable.

Adaptability is the factor which would happen with more exposure to a certain environment. The frequent use of the vr system would increase the probability of the person's adaptability skill. The self-concept is the skill which will increase with the training duration. These are highly essential skills which are to be enhanced for the special needs person to be satisfied and continue the employment period [5,11]. It is very essential to develop these 3 factors and the relationship between these factors and the case studies is further discussed below:

Self-Concept (SC): SC is the perception one has about himself

and about how others perceive him. This will improve over time with increased exposure to the VR system as the user becomes better adapted to the system and starts to score more points as he/she is able to approach more virtual characters as compared to before. This will motivate the users to use the VR system for longer and even to seek opportunity in real life as their perception about themselves and how others view them is better. This is shown by the Case study 1 where users overcame their fear of public speaking after using the VR system in which screen shots of the eyes of multiple people were displayed.

Confidence (Con): The increased adp and Sc will not only allow an increased the level of confidence in the game but also in real life situations where they would become more confident while approaching real people just as they become more confident approaching Virtual characters. The success of VR in helping people overcome their fear and become confident in situation which they would otherwise avoid or have nervous breakdown shows that Con is achievable through the use of VR.

Adaptability (Adp): Case study 1 shows that the stress levels recorded by the bio-feedback sensors drop with subsequent use of the Virtual Reality headset. This shows that the users start to adapt to the virtual environment through increased exposure which is further confirmed in case study 2. Therefore the frequent use of the VR system would increase the probability of the person’s adaptability skills in real life situations. VR exposure therapy has been successful in reducing the fear of heights, post-traumatic stress disorder. This shows that the skills learnt in a VR environment can be translated to real life situations.

Proposed Model

The virtual reality model will provide a platform for the user to experience the simulated environment. This simulated environment would fulfill the core criteria’s of overcoming social awkwardness which are listed in Figure 1. The environment in the virtual reality system would be created with the purpose to provide a simulated environment, tutorial and performance analysis. The simulated environment would consist of similar scenarios which are to be encountered by a person in their workplace. Figure 2 provides a demonstration of the connection between the skills which are to be acquired This would help the individual to familiarize with the environment, learn the kind of difficulties faced in that environment,

tips on how to tackle the situations. The simulated environment would also enable the person to learn the variety of people they would encounter in their workplace.

Performance analysis is the factor which would be used to record the frequency of usage of the system. Certain factors would be pre-decided, such as response time, date, total usage time, starting time, ending time. These factors would be recorded while the person is using the system and can be later analyzed to observe some changes. It is essential that the person is regularly exposed to the system to observe the changes. The system has to be readily available at the training centers in presence of facilitators and at home with parents. Continuous exposure is highly required to observe changes in the candidate’s social awkwardness.

Tutorial is a must in the system as it will demonstrate the appropriate usage of the VR. It can be used a reference guide to comprehend how the system would work. Tutorials aim to encourage and facilitate socialization amongst the users. It is preferred if the tutorial can comprise of the actual scenario where they would be hired, with a professional from that organization giving gist of their role. The usage of VR would help achieve the required skills for employment. Overcoming social awkwardness would enable a candidate to take up employment. Good performance in employment would earn the candidate the 3A’s, Approval, Attention and Appreciation. Therefore, it would help to increase the skills for combating social awkwardness. Higher self-esteem, adaptability and confidence are the target skills which are to be achieved from the vr system as a result. [12-15].

Conclusion and Future Scope

It is identified that inequality in job opportunities between different people of the same skill level occurs due to having or lacking social skills. If the people of determination can master social skills their chance of getting a job increase and in some cases they may be able to get a better job than what they currently have. Social skills can be improved with practice just like any other skill. This is possible by helping special needs communicate on a daily basis and in a training center but a fear of embarrassment may hold people back from trying to attain social skills. This is not the case in a Virtual environment where the person has to interact with virtual characters and therefore has no fear of embarrassment. The repeated use of this Virtual Reality application has the potential to give the user confidence that can be

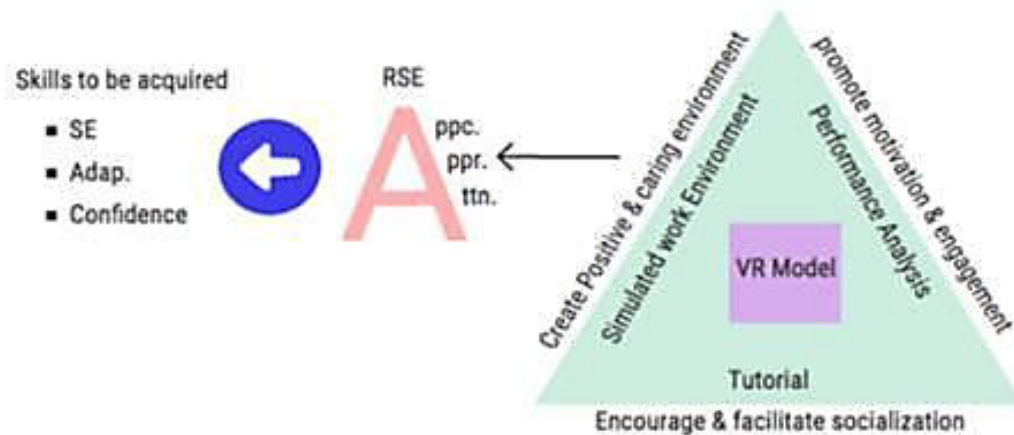


Figure 2: Demonstration of the connection between the skills which are to be acquired.

further built on by the special needs training center. Mastering social skills will allow the people of determination to equal opportunity while looking for a job, feel a sense of social inclusion in the workplace and become an active participant in the society as a whole.

Further, upon implementing the testing with special needs people and observing changes, centers may partner with potential employers who wish to employ special needs people. The employers can help the centers to build environments similar to the job and providing in depth details and challenges that may occur during the employment. Therefore, scenarios can be built to train people beforehand and work on their social skills. In addition to the VR system, others things such as speech recognition, sound, sensors, additional hardware could be used to create the scenarios as realistic as possible.

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Author Affiliation

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