



This article was carefully selected from

4th International Conference on Special Education (ICSE) 2021,
organized by The Southeast Asian Ministers of Education Organization
Regional Centre for Special Educational Needs (SEAMEO SEN)

APPLICATION OF VIRTUAL REALITY TOWARDS SOCIAL SKILLS LEARNING AMONG CHILDREN WITH AUTISM SPECTRUM DISORDER IN MALAYSIAN INCLUSIVE PRESCHOOL CLASSROOMS

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Published: 07 December 2021

To cite this article (APA): Fung, S. C. F., Rukman @ Lokman, A. A., Saifuddin, N. A., & Yin, T. K. (2021). Application of Virtual Reality Towards Social Skills Learning Among Children with Autism Spectrum Disorder in Malaysian Inclusive Preschool Classrooms. *Jurnal Pendidikan Bitara UPSI*, 14, 57-61. <https://doi.org/10.37134/bitara.vol14.sp2.6.2021>

To link to this article: <https://doi.org/10.37134/bitara.vol14.sp2.6.2021>

ABSTRACT

In Malaysian inclusive preschool classrooms, the learning of all academic subjects among Students with Special Needs (SSN) are based on the national curriculum like other mainstream students in inclusive preschool classrooms. As according to the framework of *Kurikulum Standard Prasekolah Kebangsaan (KSPK)*, social skills is a crucial element to be learnt in one key domain of the six pillars, self-appearance. However, children with Autism Spectrum Disorder (ASD) are having a complex developmental condition which involve challenges in social skills. Children with ASD take longer than other typical children to learn social skills. Fortunately, technology has grown exponentially towards providing learning tools among children with ASD such as the use of Virtual Reality (VR). VR offers a computer-generated simulation that allows its users to experience and interact with a virtually structured environment. VR has provided many opportunities for children with ASD to build social skills through the designed Virtual Environments (VEs) with the representation of people or Virtual Agents (VAs) and objects. It enables children with ASD to have control over the learning process and feel more comfortable to interact with VAs as compared to a face-to-face real communication scenario. In short, this paper will be discussing on the application of VR in assisting children with ASD in their social skills learning alongside with their typical peers in inclusive preschool classrooms.

Keywords: Virtual Reality, Social Skills Learning, Autism Spectrum Disorder, Inclusive preschool classrooms

INTRODUCTION

According to United Nations Children's Fund (UNICEF), (2017), the fundamental principle of inclusive education is that all children, regardless of their abilities and disabilities, should learn together in a shared supportive environment. This covers every aspect of a child's education from their curriculum, school accommodations, play area and necessities to be fully equipped and appropriate for all children of different requirements. Therefore, an education system that includes every child of all levels would be called inclusive education. The United Nations Educational, Scientific and Cultural Organisation (UNESCO) has emphasised to all nations the importance of expanding education in support of equal access to education for all children regardless of their differences (UNESCO, 2008).

The Malaysian Government has taken strides to provide special education through the establishments of special schools and schools with Special Education Integrated Programme (SEIP) or Inclusive Education Programme (IEP) throughout all levels as stated in the Education (Special Education) Regulations 2013 (Teng, 2016). Inclusive preschool applies the same fundamental rule of providing equal opportunities to every child with different needs and specialties to learn and adapt in their very first experience in formal education. The implementation of inclusion in preschool education allows children with typical development and with special needs to interact and build social skills with one another through engaging in daily routines (Akalin et al., 2014).

Children with Autism Spectrum Disorder (ASD) show symptoms of a lack of social skills as they struggle with a neurological disability that causes difficulties in communication (Lutfi, 2018). And with this, there emerges a need for inclusive education to broaden teaching and learning strategies in the classroom to the diverse needs of every child. Assistive technology such as the use of Virtual Realities (VR) offers an active learning experience that could help children with ASD to effectively absorb their learning experience (Benneth et al., 2019).

SOCIAL SKILLS IN KSPK

Social skills deficits are characterised by poor eye contact, lack of joint attention, pedantic or odd speech patterns, difficulty both initiating and maintaining conversations, lack of social problem-solving ability, lack of empathy, and difficulties interpreting body language (Schreiber, 2011). Therefore, social skills are assumed to be the underlying essentials to a more wholesome interpersonal life as one would have the ability to adapt to social situations and demands (Jureviciene et al., 2018). Moreover, the foundation to maintaining a more harmonious relationship with one's social surroundings all lies in the individual's capability to socialise (Sakellariou et al., 2019). With this said, the importance of social skills can be seen through the integration of social skills in Malaysian's preschool education curriculum. Through the many pillars in the framework of *Kurikulum Standard Prasekolah Kebangsaan (KSPK)*, social skills has been adapted into the domain of self-appearance, that focuses on shaping the child's personality both within intrapersonal and interpersonal. This domain is expected to help children to develop a more positive self-concept, introduce them the appropriate ways to communicate effectively as well as construct the skills to resolve conflicts (Ministry of Education, 2017). Whilst social skills is acknowledged to be a key element in preschool education, children with special needs face various difficulties in this field because for most special needs children, it becomes a challenge for them to communicate, build relationships and to manage their behaviours around the presence of other people.

Complex Developmental Condition

According to American Psychiatric Association (APA), Autism Spectrum Disorder (ASD) is categorised under neurodevelopmental disorders which is characterised by persistent deficits in social communication and social interaction across multiple context, including deficits in social reciprocity, nonverbal communicative behaviours used for social interaction and skills in developing, maintaining and understanding relationships (APA, 2013). Children with ASD experience specific social difficulties that are different from children with other developmental disabilities.

Understanding their own and others emotions, how to convey their feelings and recognise other's feelings, knowing how to start and maintain interactions appropriately, and understanding other people's perspectives are some examples of difficulties experienced by children with ASD (Teng et al., 2019). Due to this, children with ASD will face complications in building social skills according to the structured domain in the pillar of self-appearance in *KSPK*. In early childhood, the signs of ASD are evident where children with ASD show slower progress in social skills as compared to their typical development peers.

VR as a Learning Tool for Children with ASD

According to the Indiana Resource Centre for Autism, children with ASD learn well from visual media and therefore assistive technology can be a valuable tool in their learning process (Meghan, 2016). Due to this, a flexible and interactive teaching method should be established to educate children with ASD in social skills. This is because the learning style must be an enjoyable to them to gain more and experience the real scenario via the implemented system such as Virtual Reality (VR). In fact, most researchers have considered VR as a learning tool for children with ASD (Ramachandiran et al., 2015). The use of VR for children with ASD to experience virtual field trips which can support them as they prepare for trips into the field. It is found that the idea of simulating the real home using the VR helps the children with ASD to improve their social skills (Bamasak et al., 2013). Hence, using a VR as a learning tool for children with ASD is an effective method to support the social communication skills.

VR is a simulation of the real world based on computer graphics which provide children a safe environment for learning (Bellani et al., 2011). The user is provided with VR headset which is often called a Head Mounted Display (HMD) that providing visual and audio stimuli and multiple sensors that track physical movement in relationship to a virtual world (Jennifer & Colin, 2019). For example, getting dressed, obeying traffic signals while crossing the street and shopping in the grocery store that children with ASD can practice in VR. Furthermore, they may even be able to take virtual field trips, visiting places in their communities which they would not normally be able to experience. VR has provided many opportunities for children with ASD to build social skills through the designed Virtual Environments (VEs) with the representation of people or Virtual Agents (VAs) and objects. Hence, VE will be useful in teaching various social stories to the children with ASD in more interesting way.

In Malaysia, mobile technology is an emerging technology and is gaining wide popularity. For instance, a case study has been conducted on how toilet VE can guide children with ASD in toilet training (Ramachandiran et al., 2015). Meanwhile, VAs can help children with ASD to choose an avatar which is an animated character that represents themselves in the VR world. This avatar can help them to focus on how they visualise themselves beyond the restrictions of their disabilities. Not only that, it does provide a safe environment where children with ASD can practice important skills. It also provides social learning opportunities, a sense of control of the environment and the ability to modify the programme for specific user experiences.

Unfortunately, mobile technology is not owned by the majority and therefore there is some limitation to the access of smart phone applications that cater to needs of children with ASD. It has been observed that many parents do not own smart phone technology to provide behavioural training to their children with ASD via VR based behavioural training and learning resources due to the high cost (Ramachandiran et al., 2015).

DISCUSSION

VR was considered as a common learning tool for children with ASD by most researchers (Ramachandiran et al., 2015). This learning tool is very important in helping children with ASD to gain knowledge such as ways to interact with other people using appropriate language. Due to the limited expressive language and lacking of the ability to construct language among children with ASD, VR may help to provide communicative facilities (Parsons & Cobb, 2011). VR supports error-free learning and independent practice for children with ASD. It is to help them enhance their social skills in using words to express themselves to other people. Error-free learning is vital to children with ASD as so they can learn without resorting to trial and error and gain positive experience. Thus, these children with ASD can overcome their social anxiety such as fear and embarrassment when communicating with other people.

Children with ASD struggle to communicate and interact with other people as they have trouble to build relationship with strangers (Ousley & Chermak, 2013). This shows that a child with ASD does not have the ability to adapt in certain situations and communicate with strangers. Hence, VR has been used widely all around the world to help children with ASD in adapting an unfamiliar environment. VR helps children with ASD to understand some difficult scenarios by bringing them closer to experience the real life scenarios that are easily explained (Maoodah et al., 2019). For instance, VR offers some crucial daily real life experience such as virtual shopping, visiting, transportation and so on. Through this virtual scenarios, children with ASD can experience and being guided on proper social interaction

skills with other people virtually as well as practising the right behaviour. Research supports that individuals with ASD are able to transfer skills learned in virtual worlds to real world applications and situations (Papanastasiou, 2019). Therefore, VR can help children with ASD to adapt to the new environments and learn appropriate behavior more easily.

Bellani et al. (2011) stated that VR provides safe environment for learning through a simulation of the real world based on computer graphic. This article is consistent with Vasquez et al., which they also stated that VR helps provide safe environment for children with ASD (Vasquez et al., 2015). As we all know, children with ASD are not able to communicate or interact with other people. Thus, VR offers safe environments such as role-playing models to help children with ASD in practising and learning new social skills. For example, through VE these children can learn how to react or respond to some situations from the VAs in VE. Other than that, children with ASD can also practise body language such as eye contact while interacting with VAs through VE. This matter is in line with the domain of self-appearance which is to introduce children the appropriate ways to communicate effectively (MoE, 2017).

Though it is a life-long diagnosis, children with ASD can grow and learn into productive and fulfilling lives just as anyone else especially in terms of their social skills with the proper and appropriate early school based interventions. IE Programme in Malaysia helps to enhance social skills among children with ASD (Teng, 2016). In light of that, the Ministry of Education (MOE) should look into the usefulness of the VR technology and consider to include it in the classrooms learning especially in the inclusive preschool classrooms. This is to provide a better support and social skills learning experience among children with ASD during their young age.

CONCLUSION

The article highlights that VR has positively affect the social skills among children with ASD by helping them to understand the complicated scenarios, providing safe environments and communicative facilities. Hopefully, VR will continue to infuse into the mainstream of the educational process with concentrated efforts in research, development and creative applications.

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