Chapter 88
A Viable Option?
Single-User Virtual Environments to Teach Social Skills to Children with ASD

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ABSTRACT

This chapter considers whether a computer-aided technology, single-user virtual environments, can provide a viable option to teach social skills to children with Autism Spectrum Disorder (ASD). Viability is discussed in terms of key themes found in the literature: evidence-basis, generalizability, cost effectiveness, appropriateness for children with ASD, user experience, teacher's contribution, and usefulness for caregivers. A matrix is developed to provide a viability rating for each theme. The chapter concludes that evidence-basis and generalizability for single-user virtual environments as an intervention to teach social skills to children with autism spectrum disorder is weak but that cost effectiveness, appropriateness to teenage children with ASD, positive experience of the user, and potential usefulness for caregivers is strong, whilst the teacher's contribution is a mixed rating between ease of use for the teacher and the high one-on-one time commitment required.

INTRODUCTION

Statistics indicate that the numbers of children diagnosed with autism spectrum disorder (ASD) are increasing. Current estimates from the Centers for Disease Control and Prevention suggest that as many as one child in eighty-eight has ASD (Baio, 2012). This is an increase from figures released a few years earlier by the same authority which estimated that around one child in one-hundred-and-ten had an ASD (Rice, 2006). There are flaws in these estimates as increases could represent increased awareness and diagnosis of the condition as well as, by its own admission, anomalies in the reporting of data used in these estimates (Rice, 2006). Overall, however, it is difficult to refute that there is an upward trend in the numbers of children diagnosed with the condition. Indeed, the Centers for Disease Control and Prevention is concerned enough to term ASD "an urgent public health concern" (Rice, 2006, p.1).

As the number of children diagnosed with ASD is growing, the actual diagnosis is also changing. ASD, and Asperger's Syndrome, a less serious

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disorder, were previously classified by the American Psychiatric Association as one of a number of childhood developmental disorders under the umbrella of "Pervasive Developmental Disorders" (APA, 2000). However, as of May 2013, the association dispensed with these separate diagnoses and classified the range of developmental disorders previously known collectively as Pervasive Developmental Disorders under the term "Autism Spectrum Disorder" (APA, 2013). The term "spectrum" is used to indicate the wide spectrum of difficulties which individuals can have, from high functioning people diagnosed with the disorder who are able to operate at levels at the top of the spectrum, to lower functioning individuals, many with additional learning disabilities and a lack of speech, who operate at much lower levels at the opposite end of the spectrum (Simpson, Myles, & LaCava, 2008).

ASD is defined by the American Psychiatric Association in terms of two major difficulties in functionality which those with the condition exhibit, namely difficulties in socializing, and a tendency to perform restrictive, repetitive behaviors (APA, 2013). Difficulties in socializing are defined as "persistent communication and social interaction deficits in multiple situations" (APA, 2013, p. 31). The World Health Organization, which might be considered as having a global view of ASD, describes the trait as "a lack of modulation of behaviour according to social context, or a weak integration of social, emotional and communicative behaviours" (World Health Organization, 1993, p. 180). These definitions indicate that the inability to communicate and socialize in a typical, acceptable manner with other people is a serious defect that warrants diagnosis and is also something that many of those diagnosed with ASD are acutely aware of. Authors with ASD describe the effect it can have on their lives. Temple Grandin, a renowned scholar and writer with high functioning ASD writes movingly, "I had to think about every social interaction . . . I wanted to participate, but I did not know how," (Grandin, 1996, p. 153). Sinclair (1992), another writer with ASD, explains "social interactions involve things that most people know without having to learn them" (p. 299).

It appears, then, that the number of children diagnosed with ASD is rising and that there are advances in defining and recognizing the symptoms of ASD as more becomes known about the condition. With this evolving background it is not surprising that treatments for children with ASD are also evolving: both medical treatments to treat the physical and mental symptoms associated with ASD, and educational interventions to support the learning and behavioral issues associated with the condition. Adams' 2013 publication lists numerous potential dietary, nutritional, and medical treatments which may alleviate symptoms for some children with ASD. They include administering a supplement of melatonin which my help children with ASD with sleep problems, to hyperbaric oxygen therapy, where oxygen levels are increased in the patient's body via an oxygen chamber to assist some with ASD who have decreased blood flow in the brain. In addition to biomedical treatments, there is a plethora of educational interventions designed to support children with ASD. Well-established treatments include applied behavior analysis, an intervention that investigates the cause and effect of problem behaviors, and TEACCH (Treatment and Education of Autistic and other Communication handicapped CHildren), a structured teaching method that advocates changing the environment to suit the individual with ASD (Simpson, Myles, & Ganz, 2008). One of the aims of these and other interventions is to increase the skill level of children in a particular area to address their challenges in social communication, interaction and functionality. Indeed, Reichow and Volkmar (2010) found sixty-six published studies on social skills interventions which they agreed met evidence-basis criteria for potential intervention. As might be expected, many treatments designed to support children with ASD with their difficulties in communication utilize