

A Review on Assistive Tools for Autistic Patients

Ting Sing Hong, Shahrol Mohamaddan*, Syed Tarmizi Syed Shazali, Nur Alia Athirah Mohtadzar
Faculty of Engineering, Universiti Malaysia Sarawak,
94300 Kota Samarahan, Sarawak, Malaysia
mshahrol@unimas.my

Rizal Abu Bakar
Faculty of Cognitive Science Sciences and Human
Development, Universiti Malaysia Sarawak
94300 Kota Samarahan, Sarawak, Malaysia

Abstract— Persistent difficulties in social skills and social interaction present significant challenges for individuals diagnosed with autism spectrum disorders (ASD). The current literature review provides a comprehensive investigation of studies focused on assistive tools for deficits in social skills or social interaction in those with ASD. Twelve studies that met the inclusion criteria were chosen. Studies were categorized based on Computer-based Intervention (CBI) and Robot-assisted Behavioral Intervention (RBI). Each study were then evaluated on several aspects. Strengths, limitations and outcomes were discussed. All studies showed positive outcomes. **Keywords**— component; formatting; style; styling; insert (key words)

I. INTRODUCTION

Latest statistic estimates stated that almost 1 in 110 eight-year-old kids have autism spectrum disorder or Autism spectrum disorders (ASD) [1]. People with ASD habitually show noticeable shortages in both social skills and self-help skills. Social skills can be defined as “visible reactions that are crucial for a kid to get used to and deal with his/her environment” [2]. The deficiency of social interaction is known as one of the core problem for kids with ASD [3]. According to [4], there are several social skill deficits in ASD include troubles with initial a social interactions, keep up reciprocity of the interaction., perspective-taking, and inferring the other’s comforts.

There are two major type of ASD namely autistic disorder, pervasive developmental disorder and Asperger syndrome [1]. The ASD children which usually have a particular thought and unrealistic reasoning are known to be both intelligent and have an extraordinary memory. However, the interaction with their peer is always a challenging tasks for them to exercise their social skills. Especially is the disability to maintain a mutual understanding relationships with others in their emotion [5, 6, 7]. All of this incapacity directs the ASD children to a further against of the rules of communication. They cannot feel what others feel, do or spoke, and these makes them to show an attitude of offline to others.

A. Computer-based Intervention (CBI)

There is a remarkable improvements in the past decade regarding the application of the computer-based intervention (CBI) to publicize treatment to diverse clinical world. This electronic assistance approach model is capable for providing

intervention to individuals with ASD [8, 9]. Instructional video modelling by using videotapes is one of the most common technology in ASD intervention for so many years [10]. While the researcher claim that instructional video modelling is one of the helpful technique to teach skills to individuals with ASD, the present technology offers ahead of that simple video modelling to 3D virtual reality or interactive computer programs. A wide range of outcomes is targeted by this kind of innovative and cost-effective technology.

The objective of interactive approach using CBI is it enhance of the interaction between multiple users by linking together through the system that is pre-program for the autistic children. Besides, the CBI is considered as a safe yet entertaining tool because the interaction with computers is different from normal social interactions. Critical thinking and decision making issues is not required for most of the daily conversation. On the other hands, computer systems provide a monitored condition with minimal interferences yet attractive for the learning of children with ASD [11].

The teaching task is more complicated in conventional educational tools that performs through the real-world environments, because it requires instant and flexible respond [12]. Moreover, real-world environments is fix and invariable which meaning the same conditions cannot be valid more than one time.

Generally, software education platforms that generate by the CBI is the means to interpret the virtual environments so that the information can be present in an attractive way [13, 14]. By using an entertaining element during the teaching process, CBI method combines both education and entertainment (edutainment) aspect in order to trigger the curiosity in the ASD children. The use of animated object can increase the attractiveness of displays while also provide verbal and visual guidance which can minimize the comprehension of the task [15]. Furthermore, autistic children can easily relate the object with the sound effect and the text through CBI. For example, an objects in real world can be simulate by using CBI then later present it by graphical form through the monitor of a computer. Also, it come with several sound effect and multiple control variable that can be manipulate by the user. The ASD patient’s attention will be attract therefore begin to differentiate objects based on their size, color, type, and so on.