

Chapter 40

Collaborative Virtual Learning for Assisting Children with Cerebral Palsy

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ABSTRACT

Communication through speech is a vital skill, an innate ability in most human beings intended to convey thoughts, needs, and it is the very foundation of literacy. However, some people find it as one of the challenges in their lives, particularly children with Cerebral Palsy. Children with such disability suffer from brain injuries before, during, and after birth that evidently affect their motor, cognitive, and linguistic skills. Some of the additional complexities may also cause hearing, visual, and speech impairments that further decrease their learning abilities. Their development milestones in learning is slower than a typical child, thus they require intensive personal drilling. It is believed that the cognitive skills in these children can be improved to enable them to lead a more productive life. That was an antecedent that strongly motivated us to develop the proposed Virtual Collaborative Learning Tool. It aims to assist the learning ability of the targeted children through a responsive avatar of their parents, teachers, or caretakers. A preliminary study was conducted on voluntary participants to evaluate the effectiveness of the proposed learning model. The results showed 80% of the participants were able to answer questions provided within the program.

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INTRODUCTION

Children with Cerebral Palsy (CP) often have difficulties in developing speech, language, and gestural communication. Cerebral Palsy, which is known as CP, is an injury caused during prenatal, perinatal or postnatal where the brain is partly damaged, especially around the areas that control movements. It is a disorder that affects muscle tone, movement and motor skills, and it is a non-progressive disorders. Children who suffer from CP usually lack of control of their muscles. A group of studies have shown that speech disorders are associated with all types of Cerebral Palsy (Bax, Cockerill, & Carroll-Few, 2001).

Disabilities of one child with another child are different (Original of Cerebral Palsy, 2009; Peeters Verhoeven, Moor, & Balkom, 2009). The “disabilities” in this context includes the physical movement, speech impairment, hearing impairment, intellectual ability, seizures and other associated complications caused by the brain injury (Majumdar, Laisram, & Chowdhary, 2006).

A study shows that CP children have lower intelligence as compared to normal children (Valente, 1983). Children with CP suffer from a group of syndromes which does not only affect their intelligence but they also experience a range of disabilities as mentioned above. This can further affect their learning ability (Valente, 1983). Communication is essential and it encapsulates the very core of our existence and our civilisation. Without speech, people cannot express their needs, intentions or feelings. This is one of the major problems faced by CP children. These children suffer from motor speech disorder; a disturbance in the coordination of the muscles around the mouth and face. This speech impediment will greatly hamper them from producing intelligible speech, thus the inability to express oneself. Our objective is to introduce a conducive learning environment to aid in the learning process of these children.

When it comes to education, a two-way communication between the educators and child is

vital, and should be established so that the educator is aware whether the child is able to catch or understand the materials that have been delivered. For some CP children who suffer from speech problems, they have non-verbal ways to communicate, either through gesture or gaze. However, sometimes the educators do not understand the sign or gestures made by the child which cause further misunderstanding.

Therefore, in order to help those children to establish a proper communication flow between the educators and other people around them, many researchers have developed products (hardware and software) to assist those children in communicating with others. Those products are called Alternative and Augmentative Communication (AAC). Besides focusing on communication and interaction, it also provides a learning system to teach these children so that they can know and learn the things that they cannot learn effectively in the physical classroom. Most of them provide multimedia presentation, such as audio, image, text, video, etc, to assist the children in order to meet their daily needs (Lee, 2007).

‘How was school today?’ is one of the AAC products that allows disabled children such as cerebral palsy to communicate in a faster and more interactive way. It tracks the child’s movement, responses to the questions and records his or her activities. The product is placed on the wheelchair (Meadows, 2009). Other AAC products such as Broadmaker (Mayer-Johnson, 2009), STANDUP (Waller et al., 2009), and other learning programs are introduced to teach the CP children in improving their learning skills. However, these AAC products require educators to teach and train the children.

Experienced special educational needs (SEN) teachers/educators are scarcely available. It is a profession shunned by many as it demands a greater level of commitment, motivation, passion and empathy towards children than a conventional job. Repetition is required in teaching those children; therefore an educator must be extra patient in

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