MENTE AUTISM HEADBAND

AN ASSISTIVE TECHNOLOGY FOR ENHANCED LEARNING

Submitted by

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Abstract

Children with special needs across India cannot benefit fully from a traditional educational program because they have a disability that impairs their ability to participate in a typical classroom environment. Technology can play an important role to facilitate a range of educational activities to meet a variety of needs for students with mild to multiple disabilities both physical such as visual and hearing impairment and intellectual disabilities such as Specific learning disability (SLD) and Autism Spectrum Disorder (ASD). Students with severe disabilities can become active learners alongside their peers without disabilities in an inclusive classroom with adaptive technology. This case provides an overview of the role of MENTE-autism headband in enhancing social, communicative as well as behavior modifications for a ten-year-old autistic child.

Key words- Autism, technology, Mente, Special needs

Introduction

This case study investigates the benefits and challenges of Mente-Autism, in a home environment and its implications in the Montessori school specifically in an early childhood classroom.

The research is significant due to limited resources or literature on the usage of Mente-autism in India and specifically in Bangalore

AUTISM SPECTRUM DISORDER

The autism spectrum disorders (ASDs) are a group of conditions characterized by social and communication impairments and the presence of restricted and repetitive behaviors. Children and young adults with ASD can vary greatly in cognitive development, which can range from intellectual disability to above average intelligence (Hasselbring, Glaser, 2000). The research reported in this paper indicates that the usage of Mente-autism headband, its challenges, and benefits in a home environment, and its implications as the Montessori setting.

The Montessori Method

Maria Montessori was the first lady doctor in Italy. She was interested in helping children with disabilities (Montessori 1967). Montessori education was developed around inclusive education. Maria Montessori was one of the first special educators of her time and created her method based on this type of education (Mckenzie &Zascavage, 2012). She realised that children with disabilities who were restricted to hospitals, had to be moved out of the hospital and into an educational setting

(Montessori 1967). Having observed the behaviour of the children in a harmonious learning environment she developed learning apparatus which she used as a tool to observe and watch the process of "normalisation" in these children. These recordings were what she termed as "Montessori Method".

Montessori further realised that if children with certain disabilities could learn in a prepared environment then children without disabilities could learn in this setting too (Montessori 1967). Montessori then decided to open her first "house of children" which she called as casa de Bambini (Montessori 1967). This new found system of education came to be called as the Montessori Method and was adapted as an education policy around the world.

The Montessori approach is considered unique as it places more emphasis on the developmental needs of the child more than anything else. The Montessori system advocates that every child carries within him/her the person he/she will become; as a result, people in Montessori system of education are compelled to treat every child with dignity and respect. (Montessori 1967). Montessori believed in the integrity and innate intelligence of every child, even if it were a toddler or an infant.

Inclusion

Educators have the onerous task of guiding their students towards academic success. As a result, new policies and procedures that help identify special learning needs of children are taking centre-stage in Education (Cossentino 2010). The severity of impairment in language engagement, social connectedness, sensory integration, and cognitive

skills can often be overwhelming for teachers who are uninformed and untrained in the unique issues of autism (Cossentino 2010).

There is also a large debate on whether children must be placed in special schools (Ainscow 2006). There may be a justification for the placement of children in special schools as there are a small number of children for whom access to a therapeutic approach to teaching may be paramount and not easily provided in a mainstream classroom. This view is endorsed by (Cooper 2004 and Boxhall 2001) in their argument for placing some children with complex behavioural and emotional needs in nurture groups that are separate from the mainstream. However (Dyson and Vaughan) have both challenged this view and believe that the right of every child to be educated alongside their mainstream peers should take priority.

I tend to support the view of Ainscow having seen a number of children who although placed in mainstream schools appear to be unable to access the services and resources that they need, such as special educators, resource materials, access to technology to name a few.

Being the teacher to a ten year old non verbal child on severe Autism Spectrum Disorder (ASD), it was imperative to look for various options to assist the child to be receptive to the environment around. Parents of this child were equally co-operative and were very eager to try out any assitive technology to enhance communication. MENTE, which is a neurofeedback device that is based on EEG readings and is safe for home use was learnt through an acquaintance who is in the field of biomedical research. It was procured from Singapore through a certified executive who trained the parents in its usage. It is 14 months since Mente is used.

Mente-Autism Headband

The MENTE headband is a safe to use certified medical device that is manufactured in Europe and distributed through re-sellers in Europe, America, Australia and APAC region. The nearest dealer for India is in Singapore. The device costs Rs 2,00,000 (two lakhs) in Indian currency. In Bangalore there is only one Mente user on whom this case study is conducted. There is no known statistics with me about any other user in India.

A smart device like a smartphone or tablet is needed to run the MENTE app. MENTE app is available on Playstore and Apple. Since the effectiveness of the therapy is dependent on the quality of auditory feedback, the therapy is most effective when run on Apple's devices like Iphone and I pad or on high end android devices. To sync the data with MENTE's servers high speed internet is required. The data of the previous day forms the basis of therapy the next day.The therapy should be performed in a quiet non disruptive environment.

Target Population

This therapy is meant for children on the Autism spectrum in the age group of 4-14 years. The child should have passive non-regressive autism. This therapy is not recommended for children with co-morbidities like hyperactivity and epilepsy. This therapy is not effective for children with mental retardation and with congenital syndromes like fragile X syndrome that mimic autism.

How it works

Research has shown that our brain emits waves in a rhythmic pattern which can be recorded on EEG. These brainwaves can be broadly classified as Alpha waves, Beta waves and Delta waves. Alpha waves are responsible for remaining calm. Beta waves are responsible for thought process and delta waves are deep sleep waves. In a neurotypical person the alpha and beta waves are high when we are awake and delta waves spike when we fall asleep. In most children on the ASD the delta waves are unusually high even when awake and delta waves spike throughout the day. This disconnects them from the environment around. Their senses do not respond appropriately to the stimulus in the environment. MENTE is a home use neurofeedback device that uses EEG to read the alpha, beta and delta waves of the user and send this input to an app on a smart device through wireless. This app inverts the rhythm presented to it and sends it back to the user in the form of binaural beats through earphones. This happens over a session that lasts for 40 minutes. In these 40 minutes the brain's rhythm starts to mimic the rhythm that is presented to it and the delta waves are reduced while alpha and beta waves are increased. This opens up the child's brain and makes it more receptive to the environment and stimulation. It also works to reduce sensory discrepencies that are typical to autism. This therapy should be performed as soon as the child gets up in the morning since the delta waves are the highest at that time of the day. The effect of this therapy lasts till the child falls asleep. The headband used to run this therapy is a safe to use certified medical device. The therapy does not have any side effects.

Observations:

Following are some of the observations over the past 14 months:

- This child has become a calmer person. She is able to take instructions and keep her anxiety under control in the face of change or in situations that would otherwise have been stressful to her. On a vacation in December,with her parents, the fire alarm of the hotel of their stay got set off accidentally. The initial response to the shrill noise was to freeze but when told about leaving the room as this could signal danger, she walked briskly out of the room.. The anxiety had peaked, but it did not prevent her from doing the right thing.

- She is able to tolerate noises like babies crying and kids screaming and people talking loudly.

- There is a considerable increase in her visual perception. She can look in the rear view mirror of the car and figure out that her father's car is right behind.

- Her depth perception has improved . She is able to walk in a narrow strip of land next to a dug up drain.

- The sensory issues around her mouth has reduced. She is able to chew raw carrots and eat foods like apple faster.
- There is an improvement in her communication skills. At home, she consistently indicates her wants and can indicate what is bothering her when she is unwell.

- The reluctance to repeat speech sounds has gone. She repeats whatever she is able to and is constantly attempting to make speech sounds.

- Reluctance to do some of her work on her own has reduced.

- She is able to focus better and for longer.

- When she is upset, she makes a conscious attempt to not throw tantrums. Episodes of tantrums have reduced.

Benefits

MENTE has helped her adapt better as she can accept the stimulus that is given to her and cope with the environment around her. She is less reluctant and more receptive now. Episodes of screaming, incessant laughter, pulling hair from its roots are limited though not completely disappeared. Though verbal communication is still non-existant, there are some movements around speech like whistling, humming are emerging.

Limitations

Mente is expensive. Not an easily affordable assistive technology. The user of Mente must be well versed in the usage of technology. Mente headband needs un-hindered high speed broadband facility. Though Bangalore is an IT capital, broadband access are bound to have hinderances due to power fluctuations. Parents as well as therapists must

be technically well versed to the usage of Mente as it requires recording real time data. One session of mente takes a minimum time of 40 minutes in the morning when the child has just woken up. Time is a very crucial element of its usage. This is an individual based home therapy and cannot be used on multiple children. In my country where we have to provide access and support to multiple children in varied age groups Mente-headband seems a dream.

The child on whom this case-study is based, did not reflect what was expected. Basic self-help skills could not be achieved. Other than feeding some types of food, and undressing partially, Independence in any other area is still a long goal to achieve. One of the possible reasons could be that Mente was started at a later age, that is when she was 10 years rather than a 4 year old when the optimum level of help could have been achieved. Supporting Autistic children to tolerate change and cope with the unexpected and the unstructured is a huge step forward towards independent and meaningful adulthood.

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