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Breaking Societal and Learning Barriers for Dyslexic and Autistic Children

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Name
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ABSTRACT

Provide a clear and concise message on what is covered and why someone would want to attend this session.

Autism and Dyslexia are pervasive developmental disorders seen both in children and adults. Early intervention can improve these conditions. The goal of this Tech Meetup is to identify how and where we can introduce technology to identify these conditions in children, and help to improve their social interactions, cognitive behavior, and learning abilities, to let them lead a competent life.

AUDIENCE

This is a Beginner level session.

INTRODUCTION

Tells reviewers the necessary background and why it is important. Please use the 900 word limit to make the clearest case on what is at stake.

Below is the content that will be used for the presentation to brief the participant on the topic and trigger the thought process for the discussion to follow -

What is Autism or Autism Spectrum Disorder (ASD)? Autism or ASD is a condition most influenced by genetic and environmental factors. Autism is the most common form of ASD. According to Autism Speaks Org, Autism is defined as "A developmental disorder in children characterized by challenges with social skills, repetitive behaviors, speech and nonverbal communication". Latest research has shown an estimate of 1 in 59 children being affected with Autism or ASD.

What is Dyslexia? Dyslexia is a condition where one experiences difficulty in learning to read and write. A dyslexic child will face difficulty in reading fluently and accurately and will face difficulty easily and accurately retrieving the meaning of the spoken words. Dyslexia can often be a comorbid factor of Autism.

While difficulty in social interaction and communication are prevalent symptoms of autism, these often lead to affected self-esteem, depression and further isolation in the affected child; similar effects are seen in dyslexic children due to their environment. Lack of reading and writing skills and the inability to perceive and respond appropriately in regular conversation often leads to humiliation for the child in schools, with friends, and even with adults (family members / teachers); this affects their morale, self-esteem, and confidence, which ultimately pushes them to become isolated from

society. As a result, and as research has shown, these children are often drawn to technological devices, which makes them highly motivating tools for delivering interventions designed to help.

Currently, quite a few apps available in the market are used by caregivers, trainers at clinics, parents, and special-needs teachers to work and train primarily autistic children. Apps like 'Look in my eye', 'Find Me' and 'Proloquo2Go' are widely used to teach social skills, improve eye contact skills, promote language development, and grow communication skills. Additionally, research for social communication coaching was conducted on a group of autistic children using Google Glass and a prototype application named 'Holli' that was designed to assist the children in responding to social communication by prompting with appropriate answers, based on what was being spoken by the person in front. In fact, Holli was often able to understand what the user was saying before he/she finished saying it, which helped the conversation to flow naturally. As well as demonstrating its feasibility, the children also said how much they liked using it; they enjoyed the prompts and found it easy to use. A news article released in 2014 showed that Siri (Apple's AI based virtual assistant) helped a 12 year old autistic child to overcome his social inhibitions and to open up with others. Siri also helped to and to teach him social skills such as politeness and Siri turned out to be his best friend. The interaction with Siri did help the boy to overcome some of his inhibition, and he would often be able to respond and communicate with people in a social environment. (https://www.cbc.ca/radio/outintheopen/can-robots-be-human-1.4363742/how-a-teen-with-autism-found-a-friend-in-siri-1.4363856). To date, not much research or technology innovation have been seen around helping dyslexic children. However, with dyslexia, the primary concern lies in detecting the condition. Because this condition is related to difficulty with reading and writing, often this condition is misconstrued as the child being lazy, not putting in enough effort, or being mischievous. This often leads to parents and teachers to inappropriately deal with child. Thus, it is very important to detect the condition. Once the condition is detected, continuous yet patient and slow training and teaching methodologies have shown to improve the condition in the child. Because it is a lifelong condition without 100% recovery, early detection and prompt action are needed to curb and improve the condition.

Because of this, often Autism and Dyslexia are associated with a person's intelligence. To the contrary, Autism and Dyslexia have nothing to do with one's intelligence. Some of the most brilliant minds that our world has seen, have suffered either from Autism (Charles Darwin, Mozart, Sir Isaac Newton) or Dyslexia (Walt Disney, Albert Einstein, Tom Cruise). Thus, with advanced technology such as AI, HCI, Interactive media and others, we can help children with Autism or Dyslexia to contain their condition, with progressive improvement, and eventually lead accomplished and competent adult lives.

PLAN OF ACTION

Outline what will be included in the initial presentation, as well as listing out the required 10 questions. Questions should be specific and give an idea of how the submitter expects the discussion to flow.

As part of the Tech Meetup, the session will primarily be divided into 2 segments. The 1st segment will be a short presentation of 10-15 minutes talking about the two conditions – Autism and Dyslexia. The presentation will provide the participants with the background and understanding of both of these conditions and help them understand the associated problems and challenges. The presentation will also provide details on current technological support that is available to assist children with Autism and/or Dyslexia, how the parents / caregivers / clinicians are making use of these technologies, and what are the related limitations or constraints. Following the presentation, will be the discussion and brainstorming session amongst the participants that will be guided by the 10 questions, listed below, on how we can implement technology and enhance the currently available systems and apps to help and support not only the children with ASD and / or Dyslexia, but also the people managing them day in and day out.

10 Questions –

1. Questions around Autism Spectrum Disorder, and Dyslexia, and why are these life-long conditions?

2. Symptoms of autism begin to show from the age of 18 months. Research has shown that there is typically a range of 15-20 months between parents noticing and identifying symptoms of autism in their child to the final diagnosis by doctors. How can technology intervene to reduce this gap?
3. Autism Spectrum Disorder is called so, because people with ASD often have a spectrum (range) of symptoms and the intensity can vary. How do we identify the spectrum and categorize the child's disorder range via technology?
4. Because Autistic children are attracted towards technology, and avoid social interaction, eye contact etc., will using technology to help improve their condition cause them to be more socially isolated?
5. What kind of technological innovation will enhance human interaction without intimidating the autistic children?
6. In what ways can technology be used to assist the parents, caregivers, special need teachers of an autistic child? How can we help them collaborate and help them learn on handling various situation?
7. Dyslexic condition are often not understood by parents and teachers by just observing a child. What technology intervention can help in early detection of the Dyslexic condition in a child?
8. Dyslexia - Writing: A dyslexic child has difficulty in writing correctly and often mixes up similar looking letters, such as 'p' 'q' 'b' 'd' 'g' etc. How can technological devices and apps help to improve this condition in a dyslexic child, where gradually the child learns to write and identify the difference in similar looking letters, symbols or numbers?
9. Following on to question #8, how can technology help a dyslexic child thrive in school environment, where the speed of teaching and writing notes are far too quick for the child to process and write down? How can we implement assistive technology in schools to support easier and smoother learning experience for dyslexic children?
10. Dyslexia - Reading: Reading ability or fluency should not hold back a child from learning. A dyslexic child faces difficulty in reading as their mind is unable / slow to process the symbols (letters) they see with the sound they make. That should not stop a child from reading or learning. How can technology disrupt the standard way of reading and engage the child in learning various topics?

OUTCOMES/CONCLUSION

The primary outcome of this tech meetup is to trigger the thought among the participants to contribute and innovate in the field of education and learning for children with such special conditions like Autism and Dyslexia. As both these conditions are life-long, thus, it becomes necessary to identify them at the earliest in their childhood and intervene them with proper treatments. The goal of this session is to establish on how technology can be extensively used to identify these conditions, and at both home and educational institutes to assist autistic and / or dyslexic children for progressive growth and training. Assistive technology, and various apps will not only help the children with these conditions, but also the parents, caregivers, special need teachers and clinicians to effectively manage the child and track on their progress.

The key takeaway of this session is to understand the mission - As research has shown technology to be effective in treating and helping autistic and / dyslexic children, we are using the technology to act as a catalyst for continuous support and progressive development of the children, by providing them with a non-intimidating platform. Our goal is to help them gradually break their inhibitions, and eventually help them improve in their human interactions. We do not want to replace human interactions with technology and isolate them from social environment.

REFERENCES/BIBLIOGRAPHY

This section is required and should not be solely based on personal experience.

https://www.autismspeaks.org/what-autism https://www.nimh.nih.gov/health/topics/autism-spectrum-disorders-asd/index.shtml https://mhealth.jmir.org/2017/9/e140/ https://www.iproc.org/2016/1/e9/ http://www.autism-help.org/comorbid-dyslexia-autism.htm https://humanfactors.jmir.org/2018/1/e1/ https://www.researchprotocols.org/2018/5/e135/ https://www.sciencedaily.com/releases/2017/09/170914152254.htm