RESEARCH ARTICLE   OPEN ACCESS

Technology and Autism: Is Technology a Boon for Autistic Children?

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ABSTARCT

Technology has made an amazing progress in every field over the past ten years. All categories of people are using technology effectively with no age barrier. Public have become more tech-savy because they get all kind of information at their fingertips. Gone are those days where we spend time for knowledge sharing in public libraries. Now people are used to browse information through internet for knowledge sharing and for other purposes.   Unfortunately, people with different capabilities especially children with some mild mental disorders are always isolated from others and regular classroom teaching will not benefit them. Recent study shows that for children with autism spectrum disorder exhibit great improvement in learning with technology than common blackboard teaching. Computer assisted technology plays an important role in their day to day life. Computer technology can improve communication, assist in the development of social skills, and also it enhances the ability to learn. It has been found that children with autism think visually or in other words visual impact is more for these kind of children. Many children with autism are greatly motivated by computer technology. Parents and teachers should be aware of technology tools available for autistic children.   This paper describes some of the computer tools which could be used by a differently abled person.

*Keywords***:-** Autism, Communication, Assistive Technology, Visual schedules, Visual thinkers, Neurological disorder

I. INTRODUCTION

Autism is not a disease instead it is a genetical disorder which now a days increases in an alarming rate in children in our country. A wide range of technology tools could be used effectively to overcome the educational barrier for children with autism spectrum disorder. The different tools available for these children cannot be grouped or categorized as it varies from individual to individual. One tool that could be good to one child may not be the same for another child.The research studies have proved that every individual with autism is unique. Based on the requirement, it is the job of parents or caretakers to select the best suited app for their children. Many are not aware of these technology apps and hence some kind of awareness programme should be conducted to address this issue. There are websites such as Autism community, Autism Speaks [6],[7]which helps the teachers or parents to take care of such problems.

Communication is the exchange of information between one or more participants using a shared medium. What one understands and convey to the other is the main key component in communication. Individuals with autism [2], [5] find difficulty in communicating with others and it becomes a critical component even to do their do-to-day activities. Technology offers communication tools [4] with respect to reading, writing, speaking etc.

II. COMMUNICATION TOOLS

1. BOARDMAKER

Boardmaker [1] is a computer software which assist the children with autism using graphics communication symbols. Using Boardmaker software, activity based visual schedules can be designed which would help the children to understand the deeds more easily. A variety of schedule formats with over thirty onscreen templates and fifty print templates are available for use. The language used for communication in Boardmaker is receptive and effective which facilitates active communication. Schedules can be easily customized according to the need of individual using this software. Another option with this software is setting time schedule to complete each activity and the children would get visual representation of timer. With this, children would be able to realize the need to complete each activity on time. Boardmaker software assist the children by providing words with symbols which make them understand the meaning of the same and this could be customized also. This software provides symbol word processing and this would be helpful when children make their own writing. Reading materials with symbols can be integrated with this and children could view this in play mode. They will have a clear understanding of spelling, meaning and behavior of

symbol. Videos can be easily incorporated in to Boardmaker software which would be a powerful learning and behavioral tool [8] for children with autism.
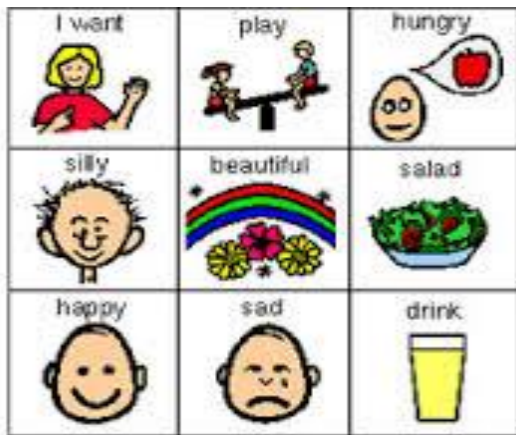

FIG 1: VIEW OF BOARDMAKER

2. AVAZ

Many researches have proved that children with autism spectrum disorder lack verbal language skill but shows great improvement in communicating with pictures [3]. Most autistic children are visual thinkers. They think in terms of pictures. Avaz, a picture based iPad and android app, is India's first Augmented and Alternative Communication (AAC) developed by Ajit Narayanan of Invention labs . Avaz uses high quality voice synthesis and picture symbols to help users create messages and develop their language skills. Avaz enables the children to express themselves by creating messages and using the speech synthesizer to speak. It helps them become independent by enabling them to interact with the device. A number of interaction switches are compatible with Avaz and can be used to operate the device. Avaz integrates a powerful keyboard to help users transitioning to text. The text prediction software enable the children to customize the device to suit their needs. Avaz is recommended by speech and language therapists working with ASD worldwide.
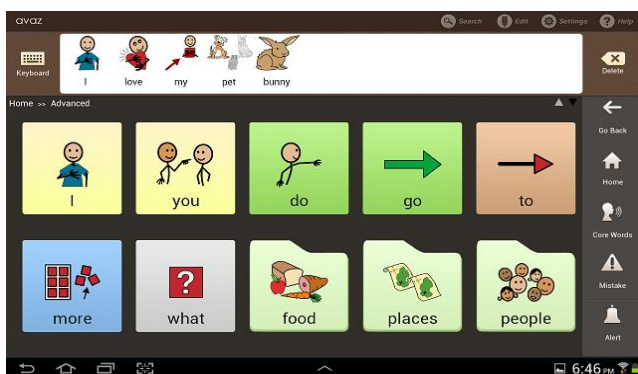

Fig2: View of AVAZ

3. VIDEO TAPING

Autistic children seem to be distracted by nature because they lack in focusing to one subject. But researches have proved that children with autism spectrum disorder are very attentive to videos and also they get highly motivated by seeing the same repeatedly. Video taping [4] helps autistic children in many ways. The day to day activities could be video taped and played for them thus enable them to organize their activities in a better way. Communication skill could be developed by showing them activities using pictures and voice. Watching videos of children short stories in their respective mother tongue facilitate them to understand the meanings of words.

4. SOLO 6

Solo 6 assistive technology tool kit helps children with difficulty in reading , writing etc. Solo 6 is a software package which includes applications such as word prediction, text reader, talking word processor [8] and graphic organizer. Strength and challenges that are faced by autistic children varies from individual to individual. A common myth about these children are the kids who cannot speak would not be able to read. Read outloud is a software program that makes the child browse through any e-book or any other study material , make the text read loud in some of the high quality voices available. In the beginning, child could be presented with short stories on the web with pictures. A parent or teacher could sit with them and read together would develop reading skill ability .Gradually the child would be able to understand the phonetics and meanings. The next step is to develop writing skill which is a critical task for many autistic children . Co:Writer, comes with Solo 6 , is a word prediction software application which help the students struggling with writing to improve spelling and grammar. As the children type a word, Co:writer interprets the meaning and gives them suggestions. After writing the children could read or hear what they have typed using write: Outloud. Write:Outloud reads the word as they written and provide them with real time auditory feedback. Another problem that encounter autistic children is that they lack in organizing schedules. After writing, children can make use of Draft: builder which help them in organizing the text in a better way. Draft: builder breaks down the writing process in to three steps: brainstorming, notetaking and writing the first draft.Solo 6 is very beneficial for children with mild disorder and also helps them in reading and writing. Other advantages of Solo 6 includes easy to use , book share support , natural speech engine, platform independent etc.

5. KID IN STORY

Autistic children would sometimes show disruptive behavior and gets aggressive very quickly. It seems to be very difficult to handle them in such a situation. A need for some technology arises where parents could divert child's attention and also teach them about the aggressive behavior which could not be appreciated . To make them focused to a particular technology is a challenging issue that need to be addressed. Kid In Story is an app which helps to create stories where the child himself would be projected as the main character. Voice can be used to narrate the story. This will make them understand their own behavior in a better way. This app has many built in templates which make them do their daily routines, organize study material, create their own stories also.

FIG 3: VIEW OF KID IN STORY

6. AUTISM TRACKER PRO

Sometimes parents of autistic kids face lot of challenges in raising the child which makes their life miserable and stressful. These challenges perhaps, child showing dislike for food, concentrating on same activity for a longer period and refuse to move on to the next activity.Autism Tracker Pro, an app which helps the parents or care takers to monitor the child's behavior, mood, diet etc for those challenging days. To keep track of progress, parents could create visual calendar which would help them understand the improvement shown by their children. This app provides the users to customize visual calendars according to their need and create charts which depicts the patterns over time from mood to behavior to health to food.This app lets them share calendars via email or any other

e-service and also can track of unlimited number of individuals.

7. TALKING TOM CAT

Talking Tom Cat is a free app which helps children to hear his/her voice through a cat named Tom. It is a very popular and interesting app which repeats the child's voice with a funny voice. Using this app, parents would be able to teach the children to respond and teach them words to communicate. This app helps the autistic children to understand the need to love pets and also teach them how to take care. Autistic children are less concerned to do their day to day activities and parents struggle to make them do the same. In this app, the daily routine of cat Tom is executed in an interesting and understandable manner which would help the child to understand the need to do their day to day activities. It also helps them to realize the emotions in a better manner through digital pet Tom.

III. CONCLUSION

Autistic children are human beings with genetically and neurologically distinct from other individuals.Autistic children exhibit exceptional intellectual capabilities and they need to get extra care and attention from teachers, friends and care takers to prove themselves .Our community should not discriminate these kids and instead of pity them we should have an open mind to work together and treat them equally as any other normal child. Accept them as and how they are and teach them verbal and behavioral skills with the help of technology. Certainly, technology becomes a bridge for autistic children to achieve their true potential. Use technology wisely, effectively and efficiently.

ACKNOWLEDGEMENT

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