Technology in Education for students with ASD

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Abstract

The National Autistic Society (2003) identified a rate of 90 per 10,000 people, taking into account the whole spectrum of autism (Wall, 2004). Therefore, traditional ways of educating these students might not be beneficial. Technology may very well be the only answer to helping students with autism. Technology is changing our lives in ways we never imagined. Work on technology has essentially merged with recent efforts to adapt technology so that all students have access to equal educational opportunities (Englert & Zhoa, 2004). Emerging technologies, when used appropriately, can be a wonderful addition to the curriculum. They’re particularly useful in allowing students to experience phenomena in ways not possible in the “real” world. Educating students through innovative ways and techniques channelizes them towards the urge to learn more and more, which in turn facilitates sustainable development. For individuals with autism, some new technologies can improve communication, assist in the development of social skills, and enhance the ability to learn. The right technology can help people on the autism spectrum improve their verbal skills, social skills, and develop confidence. Technology provides creative solutions that enable students with ASD to be more independent, productive, and included in society and community life. This paper explains about the educational level of students with ASD, importance of technology, the role of technology in education and how the technology to help the students with ASD.

Key words: Autism Spectrum Disorder, technology, skills

Introduction

The Diagnostic and Statistical Manual of Mental Disorders, DSM-IV (APA, 1994) defines autism as a pervasive developmental disorder characterized by impairments in communication and social interaction, and restricted, repetitive, and stereotypic patterns of behaviour, interests and activities. It is a complex neurological disorder that affects the functioning of the brain. Some people with autism have normal levels of intelligence, while most people with autism have
some level of intellectual disability, ranging from mild to severe (Bristol et al., 1996). There may be a range of difficulties in expressive and receptive language and communication.

For students with ASD, areas of difficulties may include oral expression, reading recognition, rote-based skills, and general fund of information while difficulties may include reading comprehension, listening comprehension, written expression including graphomotor and organization skills, mathematics, problem solving, and language-based critical thinking. As students get older and reading instruction focuses more on comprehension of abstract concepts and the ability to make inferences, comprehension difficulties become more pronounced.

Although many characteristics associated with autism present as negative academic traits, some children with autism present some positive, as well as unexpected, characteristics. Some children with autism display unique splinter skills, or islands of precocity where they display areas of giftedness: Common splinter skills include (i) calendar abilities, such as being able to give the day of the week for any date that might be provided; (ii) the ability to count visual things quickly, such as telling how many toothpicks are on the floor when a box is dropped and (iii) musical ability, such as playing a piano (Scheuermann & Webber, 2002).

**Importance of Technology in Education**

Technology is the entity, both material and unmaterial, created by the application of mental and physical effort in order to achieve some value. Technology refers to tools and machine that may be used to solve real-world problems and fulfill a human purpose (Arthur, 2009). Technology and education go hand in hand. Without technology supports and accommodations, many significantly disabled students cannot take full advantage of their education. Without the opportunities for interactions found in inclusive settings, students cannot truly demonstrate their abilities (Rocklage and Delohery, 1995).

Technology has the potential to contribute to a better quality of life for students with intellectual disabilities, which is more than just a matter of convenience (Wehmeyer et al., 2008). Patton and Roschelle (2008) argue that digital textbooks offer a better alternative than traditional textbooks because they can provide instant feedback, interactive representations, and the system of universal design for learning (UDL). It is very important to ensure that students with disabilities are prepared to meet the challenges of post secondary settings (Stodden et al., 2003). Many technological tools could increase, as much as possible, the possibilities for students with disabilities to overcome these challenges with fewer difficulties.
Educating students through innovative ways and techniques channelizes them towards the urge to learn more and more, which in turn facilitates sustainable development. Today, Technology determines the standard of education. Technology revolution is fast changing the world and creating a generation that is media-hungry and technologically savvy (Tapscott, 1998). One way to think about technologies is to divide them into three broad types: low-tech, medium-tech, and high-tech (Lenden, 2018). Low-tech items can be made from simple materials and are typically none electronic. Medium-tech devices include tape recorders for note taking, copy machines, electronic spell checkers, beepers/buzzers, and portable word processors. High-tech devices frequently include computers, alternate-input keyboards, hand-held or talking calculators, FM amplification devices, speech synthesizers, and voice recognition software.

As the world moves forwarding the era of innovative technology where learning become borderless, enhanced efficiency, competitiveness, productivity, quality and values will take precedence in determining our well-being and success in the global era. Quality education is a universal goal and is associated with the developing competency among the learners. A teacher needs to prepare students to learn, work and live successfully in the knowledge-based globe (Grey & Bryce, 2006). When the students with ASD were unable to understand the concept by traditional way, then they have to be taught in a way they should be able to understand. Students will be of different learning styles in the classroom. A single methodology cannot satisfy all types of learners in the classroom. But the implication of technology will satisfy the needs of students with ASD. Keeping these points in mind, the present article “Technology in Education for students with ASD” is undertaken to determine the importance of technology in education.

**Usefulness of technology for skill development in children with ASD**

Of the different kinds of problems, the most common problems are communication problems (repetitive or rigid language, Echolalia and Responding to questions with questions), physical problems, visual problems, concentration problems, and cognitive problems. While each condition is different, and some students deal with more than one, all students with different problems face numerous challenges in the traditional classroom environment.

Nkwoagba (2011) that technology can open doors and break down barriers for children, youth, and adults with disabilities. This could be whether in the classroom or workplace, assistive technology, including devices, software, recordings, and much more, can increase, maintain, or improve the capabilities of individuals with learning disabilities. Special education
technology has the power to provide the optimum support that students with special needs require to participate and learn along with their mainstream peer (Roland, 2015).

Cullen, Richards and Frank (2008) conducted a study to determine whether computer software would help students with disabilities improve their performance in writing. A multiple baseline design was used to study seven fifth grade students with mild disabilities in three phases: baseline, intervention using a talking word processor, and intervention using word prediction software in conjunction with a talking word processor. The results showed that five students out of seven in the study improved the number of words produced in the two intervention phases, while the number of words produced decreased with the other two students in both intervention phases compared with the baseline phase. The group mean indicated that there was an improvement in the number of words produced. In general, the results showed that the impact on most of the seven students was positive.

Bouck, Doughty and Bassette (2010) to examine how effective a pentop computer and the writing software (specifically designed for the FLYPen) was in assisting students with disabilities in writing. When using special paper created for the FLYPen, the pentop computer produces voice output to provide directions, prompts, reinforcement, and hints to students for various activities.

According to Levin and Scherfenberg (1990), technology is the gift of this generation which can be given to many children and adults with significant developmental disabilities. Technology can increase access to new experiences, new activities and new environments, bridging the gap imposed by the following ways.

**Technology in Communication skill:** People who have autism spectrum disorder (ASD) may experience a wide variety of communication difficulties. Some people with ASD may be totally non-verbal and some may have difficulties understanding social cues or appropriate conversation topics. The speech generating devices technology may help those with ASD with communication (Bionke, 2018). A speech-generating device technology is a portable that contains one or more panels or switches that when depressed will activate pre-recorded digitized or synthesized speech output. These may be a standalone device, usually very small and light, or it can be software that is installed in a tablet or phone.

**Technology in Visual skill:** Visual boards technology help children with autism express their preferences, emotions, understand rules, and schedules. Visual boards usually consist of a series
of pictures, sometimes with words labeling each picture that children can point to or arrange in order to express their needs or desires. Visual boards can be modified to an individual child’s needs by showing simple or more complex images.

**Technology in Social skill:** As a result technology, persons with significant disabilities will have greater opportunities for meaningful participation and interaction in a wide variety of settings (Levin and Locke, 1999). People on the autism spectrum can have a hard time with social skills that may come easily to those who are not on the spectrum. Some caregivers or those on the spectrum may choose to try to develop those social skills with technology and methods that can help individuals recognize facial and behavioral cues that can help social functioning. FaceSay social skills software Game technology that can help ASD children/adults to better recognize behavioral and emotional cues. Their focus is on students who can benefit from this software in school and friendship relationships.

**Technology in Daily living skills:** In order to function independently, daily living skills such hygiene, organization skills, and recreational skills are important. Caregivers can help those with ASD with these skills, but individuals with ASD can also develop these skills and independence. It is important to remember that ASD occurs in a wide spectrum and that some with ASD might never have problems functioning independently, while others may need more assistance. Life skills can be taught through instruction and presentations with the help of multimedia package (Levin & Scherfenberg, 1990).

**Roles of technology for students with ASD**

Technology has long played an important role in removing barriers for students with ASD. In many ways, the same is true for students suffering from serious illnesses. The comfort of a familiar environment and the ability to work at their own pace that is characteristic of technology can help these students. For example, students who fall among the autism spectrum can benefit from technologies and the limited distractions (Sheets & Wirkus, 1997), such as

- Maximize independence in academic and employment tasks.
- Participate in classroom discussion.
- Gain access to peers, mentors, and role models.
- Participate in experiences not otherwise possible.
- Increased self-motivation
- Expanded learning and life experiences
- New opportunities for interactions and communication
- Changed vision of potential by adults, peers and child (Sheets and Wirkus, 1997)

**Implication**

The primary aim should be to allow children with disabilities access the technology which meets their needs and provides for maximum participation in social and educational environments (Wilds, 1989). More recently, technology has come to the forefront of the movement to integrate all types of diverse learners into the educational mainstream. This movement focuses on using technology to provide equal educational opportunities for students of many different ethnic groups, linguistic backgrounds and social and geographical circumstances.

Technology can enable teachers to personalize the learning experience by delivering instruction in a variety of modes. The special educators and teachers have to select developmentally appropriate technology in their teaching. Teachers must understand how technology may provide opportunities for the student with disabilities to control environments, to stimulate imagination, to interact with others, and to use open-ended exploration to facilitate development of higher order skills. Government should organize relevant courses to increase the awareness and application of technology are to be introduced for teachers and lectures. Many service courses are to be organized by the extension services department and Department of Education to orient the teachers and lectures towards technology in education. Chalk and Talk method of teaching should be avoided and newer instructional technologies should be introduced.

**References**


