NEED OF ASSISTIVE TECHNOLOGY IN INCLUSIVE EDUCATION LEARNING

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ABSTRACT

Assistive technology is an umbrella term that includes assistive, adaptive, and rehabilitative devices for people with disabilities and also includes the process used in selecting, locating, and using them. The concept of inclusive education has brought with it the much-needed share of equality in approach for the education of the 'disabled' by giving them a leveled field to rightly exhibit their differential abilities, proving themselves capable enough to learn and perform together, at par with their non-disabled peers. Effective technology integration can help provide all learners the ability to access the general education curriculum, offering them multiple means to complete their work with greater ease and independence in performing tasks that they were formerly unable to accomplish, or had great difficulty in accomplishing. For a child with a surgically implanted medical device who is receiving special education and related services under this part, a public agency is not responsible for the maintenance, programming, or replacement of the medical device that has been surgically implanted. Assistive technology should not be viewed by educators within a 'rehabilitative' or 'premeditative' context, but as a tool for accessing the curriculum, and exploring out means to help students achieve positive outcomes. Many students with disabilities require assistive technology to participate in and benefit from their educational programs. A range of technology solutions is available to support student performance, achievement, and independence in the following areas: academics and learning aids, aids to daily living, assistive listening and environmental aids for the hearing impaired and deaf, augmentative communication, computer access, leisure and recreation, seating, positioning, mobility, and vision.

Keywords: Assistive Technology, Disability, Inclusive Education

INTRODUCTION

Assistive technology for people with disabilities is gaining a lot of attention across the globe in the past few years. Such assistive technology is one of the essential components while rehabilitation interventions are being planned for disabled people. Not only does the assistive technology help in enhancing the body functioning, but it improves daily performance, and independent living, thereby enhances the quality of life among these people. The WHO Rehabilitation 2030: A Call for Action, therein ensuring equitable access to assistive technology to people with disability is one of the top priorities. Further, at The Global Research, Innovation, and Education in Assistive Technology (GREAT) Summit 2017, WHO identifies many research priorities on Assistive technology, practice areas, and service delivery models for the assistive technologies.

Children with disabilities experience different forms of exclusion, which may cut them off from health, education, and social services, and limit their participation in family, community, and society. This isolation can have lasting effects on future employment opportunities and participation in civic life. Supportive services and technology can enable children with disabilities to take their place in society and contribute to their families and community. Assistive technology is any device that supports the independence of a person with a disability. Assistive technology can be something very simple and low-cost such as pencil grips or text highlighters, or something more sophisticated, such as a computer station with speech-to-text tools. Assistive technology (AT) devices can decrease student's isolation and allow them to become part of regular subject area classrooms. Assistive technology then becomes a tool that provides a method for an individual who is

experiencing a disability or other issue to still participate in a classroom. The application of assistive technology in schools for students classified as having a disability is required through laws such as the Individual with Disabilities Education Act (IDEA). As the inclusive education of all students occurs more frequently within the standard classroom, then it becomes important that the knowledge/experience base for all teachers needs to be expanded to incorporate assistive technology approaches and accommodations.

The changes in the student population of special needs students, such as students with disabilities and language issues that have occurred in schools in recent years are having a major impact on changing the learning goals, the teaching methods, and the means of assessment for all students. Teachers today, more than ever before, are teaching more students with special needs, such as students with physical or learning disabilities, emotional disabilities, and English as second language students. Teacher preparation programs then need to ensure that teachers are educated in special needs pedagogy and assistive technologies as they relate to general education. The educational environment needs to be designed or adapted for all students to have the opportunity for success, even those students who may need modifications and accommodations. Addressing the individual learning needs of all children, youth, and adults, with a specific focus on those vulnerable to marginalization and exclusion; inclusive education as an approach implies all learners, with or without disabilities, to be able to learn together through access to common pre-school provisions, schools and community educational setting with an appropriate network of support services, which can be possible only in an exile education system that assimilates the needs of diverse learners and adapts itself to meet these needs, ensuring that all stakeholders in the system are comfortable with diversity and see it as a challenge rather than a problem.

INCLUSION

Inclusion involves keeping special education students in general education classrooms and bringing the support services to the child, rather than bringing the child to the support services. Inclusion is a term that expresses commitment to educate each child, to the maximum extent appropriate, in the school and classroom, he or she would otherwise attend. It involves bringing the support services to the child (rather than moving the child to the services) and requires only that the child will benefit from being in the class (rather than having to keep up with the other students). Proponents of inclusion generally favor newer forms of education service delivery (Wisconsin Education Association Council, 2001).
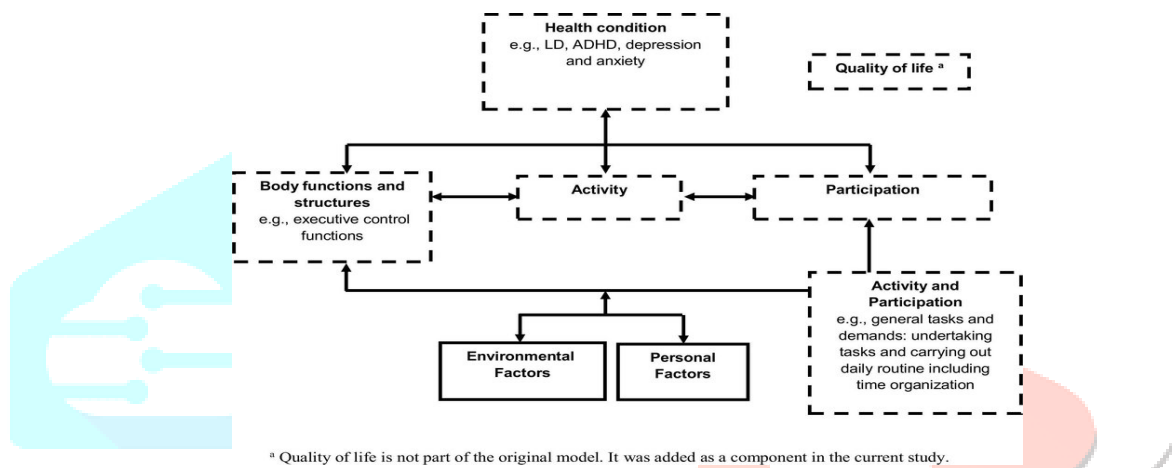
The term inclusion does not appear in federal law or regulations, but its use to refer to the Concept of integration of students with disabilities has become standard, and many court cases use the term. In the literature, one will encounter "inclusion," "full inclusion," "integration," "full integration," "inclusive schools," "inclusive education," and unified system"--all terms used to describe the philosophy and the practices of the full participation of students with disabilities in regular education classrooms (Price, Mayfield, McFadden, and Marsh, 2001) There seem to be two general approaches to inclusion: inclusion and full inclusion (Price, Mayfield, McFadden, and Marsh, 2001). Inclusion represents a belief that students with disabilities belong in the regular program of the school where special services are available to support the effort.

ADDRESSING DIVERSITY IN INCLUSIVE

Education is the most essential ingredient in the development and empowerment of individuals, and inclusion in education irrespective of the varied socio-economic differences and the differences in 'abilities' and 'disabilities' (Praisner, 2003), undoubtedly makes this foundation much stronger (Ahmad, 2014). A school system emphasizing education for all should ensure the right of all children to a meaningful education based on individual needs and abilities (Johnson, 2002). Any child may experience a special need during his educational years (UNESCO, 1994), and as a result, some children feel 'left-outs and never enter school or enter only for a few years and, as repeaters, or become 'drop-outs' or 'pushed out's, without their needs having been met. These children are a vivid illustration of the failure of schools to teach rather than thrown failure to learn (Lindsey, 2007; Norwich, 2008). The geographical and social segregation of students with 'disabilities', from their 'non-disabled peers, in learning and development, is further a failure of meaningfully integrating students in mainstream schools (Singh, n.d.). Inclusive education, more than mainstreaming the learners with special needs, is also concerned with identifying and overcoming all barriers for effective, continuous, and quality participation of all in education (Ramchand and Dummugudem, 2014; Ahmad, 2015a), and providing a 'least restrictive environment (LRE) to satisfactorily aboard children with disabilities a meaningful

educational benefit, together with others, in an accessible physical and human environment (ICF, 2001; Gal et al., 2010). Over time, there has been a considerable shift in the understanding of 'disability, from the earlier medical interpretations of seeing disability as a deficit within the individual, to the concept of human rights and equitable opportunities for participation of all individual's (Wolery, 2000).

The International Classification of Functioning, Disability, and Health (ICF) developed by the World Health Organization (WHO), uses the term participation rather than inclusion (ICF, 2001; Simeonsson et al., 2003), and acknowledges the many barriers faced by children with disabilities in their educational experience. It shifts the debate, which traditionally was much child-oriented, to become more focused on environmental factors that both affect and potentially facilitate children's participation in their everyday lives (ICF, 2001; Simeonsson et al., 2003; Gal et al., 2010). 'Functioning' and 'disability' are therefore seen as multi-dimensional concepts relating to the body functions and structures of individuals, the activities people do and the living areas in which they participate, and the factors in their environment that affect these experiences. The 'activities' are basic actions deliberately undertaken to accomplish a task by an individual, as opposed to particular body functions or structures; while participation implies the activities that are integral to economic and social life and the social roles that accomplish that life, like being able to attend the school.

ᵃ Quality of life is not part of the original model. It was added as a component in the current study.

Components of the ICF model (WHO, 2001)

USE OF ASSISTIVE TECHNOLOGY IN INCLUSIVE CLASSROOMS - LEARNING NEEDS

Assistive technology in special education is becoming increasingly more important as our learning environment changes both at home and in educational institutes. As education evolves, we are seeing demands for functional and accessible distance learning solutions. One part of the solution, especially for special environments, is the use of blended learning. The introduction of hybrid learning for simultaneous teaching for both in-class and online students becomes even more important. Assistive Education Technology becomes an option for both teachers and parents to ensure their students with special needs, impairments, or disabilities can progress and create more inclusivity for all classrooms. Continue reading on to find out how assistive technology in special education can help you accommodate and adapt the learning environment for students with special needs. Or, if you are unsure if technology is the answer, check out our complete guide on Technology in the Classroom. Assistive technology in special education is not a new practice. However, as government policies and social movements strive to create more positive and inclusive environments for our communities with special needs, impairments, and disabilities, it is important to help all parents, teachers, and even students learn how to accept and adapt. Distance learning is a helpful solution for this. Technology is the easiest way to help spread information, offer simple and fast solutions, and help create adequate yearly progress.

Approaches in the use of assistive technology in inclusive education focus on using technology to train or rehearse and to assist and enable learning. A large population of 'at at risk' students are seen to need assistance, but since they often don't easily fit into a diagnostic profile, they often lack assistance. Assistive technology serves in bridging this gap by 'assisting' in the practice of educating children in the same classroom, including children with physical, mental, and developmental disabilities (Smith et al., 2005); helping them to learn the material in a way that they can understand, by eliminating barriers that had been preventing them from being at the same level as their peers.

Offering practical tools for application of the principles of cognitive theory to teaching and learning, assistive technology connects a student's cognitive abilities to an educational opportunity that may not be accessible due to a disability; like a student facing difficulty in decoding text can make use of a text-to-speech screen reader as a 'bridge' between the written text and the ability to process the information aurally and cognitively; while a student who has difficulty sequencing thoughts in the text can use graphic outlining software as a bridge to visual processing skills (Hernandez, 2003). Hence, with effective integration of assistive technology into the regular classroom, students can have the provision of multiple means to complete their work, with greater independence in performing tasks that they were formerly unable to accomplish or could accomplish with great difficulty; through suitable enhancements or changed methods of interaction with the technology, needed to accomplish such tasks.

ASSISTIVE TECHNOLOGY FOR EDUCATION

Assistive technology in special education is becoming increasingly more important as our learning environment changes both at home and in educational institutes. As education evolves, we are seeing demands for functional and accessible distance learning solutions. One part of the solution, especially for special ed environments, is the use of blended learning. The introduction of hybrid learning for simultaneous teaching for both in-class and online students becomes even more important. Assistive Education Technology becomes an option for both teachers and parents to ensure their students with special needs, impairments, or disabilities can progress and create more inclusivity for all classrooms. Continue reading on to find out how assistive technology in special education can help you accommodate and adapt the learning environment for students with special needs. Or, if you are unsure if technology is the answer, check out our complete guide on Technology in the Classroom.

Assistive technology in special education is not a new practice. However, as government policies and social movements strive to create more positive and inclusive environments for our communities with special needs, impairments, and disabilities, it is important to help all parents, teachers, and even students learn how to accept and adapt. Distance learning is a helpful solution for this. Technology is the easiest way to help spread information, offer simple and fast solutions, and help create adequate yearly progress. Inclusive classrooms have been shown to not only help create this adequate yearly progress but have great social implications on individuals both with and without special needs. People with special certain needs become productive, happy, and independent people within communities, workplaces, and so much more.

MODERN USAGE OF ASSISTIVE TECHNOLOGIES

While most modern usage of assistive tech leans more towards medical devices, it can also refer to educational tools such as Educational Technology. Educational Technology is a form of assistive technology. The biggest benefit of Educational Technology for students with certain needs is that it makes it easier for students, parents, and teachers to create an engaging, inclusive, and personalized environment. Students with special needs, impairments, or disabilities sometimes need different strategies. But it can be hard for teachers and parents to get the information due to lack of support or other factors. This is particularly true in 2020 with the rise of distance learning and health urgencies around the world.

Many parents and teachers already feel uneasy about the state of education institutes and opportunities. They have fears about regression since they do not have the resources or training to help students. Many teachers also have fears as they work to make more inclusive environments for their students with certain needs who may experience health complications. The shift and creation of new environments is the perfect opportunity to tackle these issues head-on.

USE AND APPLICATION OF ASSISTIVE TECHNOLOGY IN EDUCATION

Sl. No.	CATEGORY/ AREA OF FUNCTION	ASSISTIVE TECHNOLOGY APPLICATIONS	NEED AND RELEVANCE IN CLASSROOM LEARNING
01	Reading	Electronic books, books adapted for page-turning, Single-word scanners, Predictable texts, Tabs, Talking electronic devices/software, Speech Software.	For students having difficulty in reading and understanding written text and in paying attention to the reading assigned.
02	Writing	Pen/Pencil grips, Templates, Word processors, Word card/book/wall, software, Spelling/Grammar checker, Adapted papers.	For students having problems in writing or composition
03	Math	Calculators, Talking Clocks, Enlarged Worksheets, Voice Output Measuring Devices, Scientific Calculators.	For students having computational problems and confusions and finding it difficult to perform well in Math lessons.
04	Hearing	Hearing Aids, Pen, and paper, Signalling Devices, Closed Captioning	For students who have difficulty in hearing or are absolute hearing impaired.
05	Vision	Eyeglasses, Magnifier, Screen Magnification, Screen Reader, Braille Large Print Books, CCTV, Audio Lesson Tapes	For students who have difficulty in seeing or lack complete vision
06	Specific Learning Disability and Attention Deficit Hyperactivity Disorder (ADHD)	Use of applications/devices depending upon the degree of disability/difficulty, in the area of reading and writing (Dyslexia), hand-eye coordination, written expression and composition (Dysgraphia), difficulty in fine motor skills, Coordination (Dyspraxia), Math (Dyscalculia) and Attention (ADHD) like -Talking electronic devices, Calculators, Electric Organizers, Highlighters, Pencil Grips, Post-its, Computers, Spelling / Grammar Checker, Electronic Organizers, Recorded materials, Handheld Scanners, Print or picture schedule, Electronic Diaries, etc.	For Students having problems in language development, reading and writing (Dyslexia), hand-eye coordination, written expression and composition (Dysgraphia), difficulty in fine motor skills, Coordination (Dyspraxia), Math (Dyscalculia), and ADHD.
07	Augmentative/ Alternative Communication	Communication Board, Device with speech synthesis for typing, Eye gaze board/ frame, Voice output device	For students having problems in comprehension of language, and lacking the ability to express it, or are unclear in speech and demonstrate delayed expressive language
08	Computer Access	Word prediction, Alternative Keyboards, Pointing Option, Switches, Voice recognition software	For students finding it difficult to access the computer in its standard form and have difficulty in performing academic tasks

The success and applicability of an assistive technology device are measured by its actual usage, ease in accessibility by its users, and their satisfaction in interaction with their environment. It is essential to ensure that the assistive devices are need-based, inexpensive to produce, purchase and maintain, easy to use, and effective, which can be ensured by the direct involvement of the potential users at each stage of designing and development.

ASSISTIVE TECHNOLOGY IN INCLUSIVE CLASSROOMS

Assistive technology (AT) can be an effective accommodation for children with learning and attention issues. Understanding what AT is and how it works is the first step toward finding the right tools for your child.

(a) Assistive Technology for Reading: Assistive technology (AT) can be a powerful way to help children with reading issues, including kids with dyslexia. This guide is an introduction to AT tools for reading and where to find them.

(b) Text-to-Speech Technology: What it is and How It Works Text-to-speech (TTS) is a type of assistive technology that reads digital text aloud. It's sometimes called "read aloud" technology. TTS can take words on a computer or other digital device and convert them into audio. TTS is very helpful for kids who struggle with reading, but it can also help kids with writing and editing, and even focusing.

(c) Text-to-Speech (TTS): Learn the basics about text-to-speech, what the research says about how well it supports comprehension, tips on how to get the most out of the technology, and a shortlist of recommended text-to-speech tools.

(d) Assistive Technology for Writing: Assistive technology (AT) can help kids with different types of writing challenges. AT tools can make the physical act of writing easier, as well as help kids who have trouble with spelling and grammar, and with organizing and expressing their thoughts. This guide provides an introduction to AT writing tools and where to find them.

(e) Dictation (Speech-to-Text) Technology: What It Is and How It Works Dictation is an assistive technology tool that can help kids who struggle with writing. Kids can use dictation to write with their voices, instead of writing by hand or with a keyboard — helpful for kids with dysgraphia, dyslexia, and other learning and attention issues that impact writing.

(f) Exploring Digital Literacy Practices in an Inclusive Classroom: Get insight into how a 21st-century literacies perspective can support inclusive literacy practices that create a community of learners, use digital tools to make the curriculum accessible, and link academic goals with real-world platforms.

(g) Responsibly Incorporating Technology into Literacy Instruction: In this overview, learn how to capitalize on the benefits of incorporating different types of technology in literacy instruction (such as electronic books, and reading intervention programs) while minimizing the potential pitfalls.

ASSISTIVE TECHNOLOGY FOR STUDENTS WITH VISUAL IMPAIRMENT / BLINDNESS

Educating students with visual loss poses a great challenge, unlike sighted children who can learn easily so many things by observing and imitating. However, education is indispensable for every citizen, irrespective of health condition or disability. According to The Universal Declaration of Human Rights, Article 26 United Nations, everyone has the right to education and technical& professional education shall be available to all. The important aspect of educating children with visual disabilities is to make them literate, self-reliant, and useful individuals to society. The child with visual impairment needs more time to learn things or in performing basic life activities. They require guidance and supervision from special educators and trainers or other rehabilitation professionals. The visual impairment to a child necessitates the use of special educational methods or adaption to materials. They need to use special aids and AT to be able to accomplish various educational activities while learning.

AT for visually impaired (low vision) and blind people is based on the use of sight or other senses, e.g., touch or vibration, sound, and smell. For example, braille and embossed print require touch to generate information for visually impaired and blind people. Over the last few years, the development of AT, including technology for people with visual impairment, is significantly improved mainly in industrialized countries. Despite such a rapid development of AT, there is no internationally accepted uniform and holistic classification of AT for visually impaired and blind people, especially for students with vision loss. Special educators, academics, and occupational therapists have tried to classify AT as visual impairment without a specific mention for students' learning and teaching. Evidence shows that there is no consensus and uniform classification on AT for students with visual impairment.

PRE ACADEMIC LEARNING

These are technologies that support early learning in children with low vision and blindness. Supporting the learning of young children with visual impairment and blindness can enhance their academic and functional performance at a later stage of their education. The development of visual behaviors, haptic or tactile awareness, fine motor skills, and use of the residual vision in playing, and social interaction enable the learning of more sophisticated and complex functional behaviors and skills in subsequent years. Technologies enhancing the sense of touch and haptic awareness are available, for example, simple tactile toys or kits, toys that give off light or produce sound, and embossed print toys

READING

The act of reading is fundamental to many learning activities for school students. Literacy is a requisite skill and knowledge for a wide range of work-related, leisure, and other life maintenance activities in today's societies. AT to support reading and learning depend on the student's level of visual functioning and their literacy level as well as the environment and task demands. These technologies help students' academic

performance whenever possible in the classroom or later in life. Few examples are large print books, multiple window typo scope, optical magnifiers, DAISY books, braille reading materials, refreshable braille display, and screen readers.

WRITING

Students with visual impairment and blindness face a lot of challenges in writing tasks involving typical writing and visual writing, such as ink on paper or type on a computer screen. Students with visual impairment and blindness can experience difficulties in learning the mechanics of writing (e.g., punctuation and spelling), taking notes during classes, and engaging in the various phases of composing (e.g., prewriting, drafting, and editing) due to limitations of their visual acuity, visual field. There are a variety of assistive devices used to support students with visual impairment and blindness for writing tasks. Few common devices are braille slate and stylus, Jot a Dot, Perkins Brailler, and braille electronic notetaker

MATHEMATICS

The majority of mathematics relies on visual instruction, so learning mathematical concepts is a great challenging task for students with visual impairment and blindness. For instance, concepts such as direction, quantification, and shape require substantially more cognitive processing when visualization is not possible. Textual and audio supports, such as braille textbooks and talking calculators, are useful in facilitating student's access to mathematics materials; however, tactile support and haptic technology at times offer advantages in the promotion of concrete mathematical understandings in students with visual impairment and blindness. Some assistive devices use in mathematical learning. Few examples are abacus, braille compass, braille ruler or protractor, raised line graph, talking calculator, and tactile geometric kits.

SCIENCE

Similar to math learning, science course is also traditionally depended on visually-oriented concepts and information. Although this visual information is not made widely available in a format that can be easily accessed to visually impaired students, some devices can be used for science teaching, for example, tactile maps, tactile diagram set for sciences, tactile anatomy atlas, animal models, plants, or three-dimensional models objects, e.g., DNA twist model. Students can touch and explore it.

ORIENTATION AND MOBILITY

Orientation and mobility are building blocks of students' learning. It is critically important for students with a visual disability as they need to learn to move safely and independently throughout school environments with the use of their remaining senses. Students should be taught how to move around in the classrooms, library, halls, doorways, stairs, curbs, parks, and refectory. Various mobility devices are a long walking cane, children's walking cane, guide cane, symbol cane, and support cane.

MULTIPLE DISABILITIES

When a student is diagnosed with multiple disabilities, it means they have simultaneous impairments that cause severe educational challenges. Simultaneous impairments might be, for example, intellectual disabilities and orthopedic impairments, or blindness and intellectual disabilities. With the challenges presented by both disabilities, the student's academic needs can't be effectively met by addressing one disability or the other. It's the combination of the two disabilities that presents unique and severe educational barriers, and both disabilities must be addressed.

Students with multiple disabilities may have the following challenges in the classroom:

- Difficulty maneuvering around the school or classroom
- Trouble sitting in certain positions for a long period
- Difficulty with fine motor skills such as grasping and pinching
- Barriers to communicating with teachers and peers
- Due to the complexity of coping with two or more disabilities, students with multiple disabilities often require the use of assistive technology, which helps students succeed in the classroom. Keep in mind that every child is different and will require their own unique set of accommodations and services.

As we explore how assistive technology can help, look for ideas that may work for particular students in your classroom.

ASSISTIVE TECHNOLOGY FOR SEATING AND POSITIONING

Students are required to assume many different physical positions during the school day. Most students have no problems managing the multiple positions that are required; from standing and walking to get where they need to go to sitting in various places throughout the day (desk, floor, lunchroom, library, playground, etc.). However, when a child has physical challenges ranging from slight to severe, this automatic task can have a significant impact on their daily functioning. Focusing their attention on trying to maintain their body position takes attention away from academics and learning. Children with mild motor involvement may have problems that manifest in excessive movement in and around their seats and desk. Children with significant motor issues may have difficulty managing all aspects of their body including, head control, trunk control (required for a stable base to work from), and positioning of their extremities.

VARIABLES FOR POSITIONING WITHIN THE SEAT

There are many aspects to consider when determining the optimal seating and positioning for a student (Berner, T. (2007) Lange (2000e) 2000h, 2001b, 2007a). An OT approach to seating and positioning can be found in the Gregorio-Torres (2006) article Wheelchair and Seating Evaluation. Gregorio-Torres addresses the factors of seating including medical; physical; ADL/IADL; environmental; and mobility. The importance of posture evaluation and body measurement is explained with regards to determining optimal seating. There are devices for positioning the pelvis, trunk, head, and extremities. The positioning chart at http://www.atilange.com takes each area and identifies the part of the body, problem, possible cause, suggestions for intervention, and goals of the intervention. Starting at the pelvis and moving through the trunk, hips, knees, ankles, and feet, shoulders, elbows and upper extremities, and the head and neck area, this chart systematically organizes the body and how to best support it (Pedersen, Lange 2001).

ASSISTIVE TECHNOLOGY FOR STUDENTS WITH HEARING AND/OR SPEECH IMPAIRMENTS

Word processing and educational software may help hearing-impaired students in developing writing skills. Alternatives to audio output can assist the hearing-impaired computer user, in place of using a standard keyboard and mouse. Advanced speech synthesizers may act as substitute voices, providing a compensatory tool for students who cannot communicate verbally. Students with portable systems can participate in class discussions once adapted computers provide them with intelligible speaking voices. Students with hearing and/or speech impairments can use standard written or on-screen documentation without difficulty, with the development of adequate speech and language patterns using supportive aids like recorded tapes, speech trainers, photo albums, articulation charts, concrete objects, and other visual cues, for language learning, speech training, and speech correction. While 'text telephones can help in allowing phone conversations to be typed and read rather than be spoken and heard, the 'computerized speech recognition' software allows the computer to change a spoken message into a readable text document that can be easily read by the hearing-impaired students.

ASSISTIVE TECHNOLOGY FOR STUDENTS WITH SPECIFIC LEARNING DISABILITIES

For students having Specific Learning Disabilities, educational software can help in skill-building, by learning multisensory experiences, positive reinforcement, individualized instruction, and repetition. Students having difficulty processing written information can complete writing assignments and tutorial lessons with the aid of computers, like the standard word processor, which may prove a valuable tool for students with Dysgraphia, an inability to write legibly. Quiet work areas and ear protectors may make computer input easier for students who are hypersensitive to background noise and get easily distracted. Adaptive devices like large print displays, alternative colors on the computer screen, and voice output can help in compensating for reading problems. 'Electronic Math Sheets' help in the organization, alignment, and working of the Math problems on a computer screen, where the numbers appearing can be read aloud through the speech synthesizer, helping students facing difficulty in aligning Math problems using pencil and a paper. Software like 'Abbreviation expanders' can prove helpful with word processing to create, store, and re-use abbreviations for frequently

used words or phrases, to ensure proper spellings for students who have difficulty in writing. The Paper-based Pen technology (Liao et al., n.d.), can record and link audio to what the student writes using the pen and the special paper, enabling notetaking while recording the teacher's lecture simultaneously, which the student can also listen to later by touching the pen to the corresponding handwriting or diagrams. This technology proves useful for students struggling with listening, writing, memory, and reading skills. Students having difficulty interpreting visual material can improve comprehension and the ability to identify and correct errors when words are spoken or printed in large fonts. Computer documentation in electronic forms may be used with enlarged character and voice synthesis devices to ensure better access to those with reading difficulties.

Assistive technology has a major role in remediating and compensating the performance deficits experienced by students, enhancing the student's performance; and ensuring effective evaluation as accommodation during testing, learning adequate solutions when an extended evaluation is needed. Effective technology integration in education can therefore help in addressing the functional barriers experienced by students with disabilities, providing them with equitable learning opportunities and a leveled field to rightly exhibit their differential abilities, through the provision of necessary support and an equally accessible learning environment to all.

TECHNOLOGY ACCESSIBILITY

It can limit opportunities for people with disabilities to get hired or to excel in a position when they are unable to perform their job duties because they can't access basic workplace tools. On the flip side, when an organization's technology infrastructure is accessible, it can optimize on both the individual and organizational level. When talking about technology, "accessible" means tools that can be used successfully by people with a wide range of abilities and disabilities. When technology is accessible, each user can interact with it in ways that work best for him or her. Accessible technology is either *directly* accessible, whereby it is usable without additional assistive technology (AT), or it is compatible with AT. For example, a mobile smartphone with a built-in screen reader is directly accessible, whereas a website that can be navigated effectively by people with visual impairments using a screen reader is AT-compatible.

Availability may prove another potential barrier to the use of assistive technology; besides it may appear costly for both the schools as well as the students. It is found that assistive technology such as screen readers, voice recognition software, and joysticks remain out of reach for many individuals due to cost, lack of information, and limited availability. The cost for technology, nevertheless, serves as an investment in helping students to achieve academic independence and success. There should be an effective liaison with agencies or service providers who can help students acquire the technology needed to enhance their learning. During the implementation of the technology, it is essential to locate equipment where instruction and learning have to take place, preferably selecting low-tech applications, and the accessibility and integration of the use of technology into lessons should be ensured in a purposeful and meaningful way. The necessary training and technical support should be provided to classroom teachers and support staff, considering the initial fiscal and human resources as an investment and at the same time avoiding reinventing the wheel each year, preferring technology that is already in place whenever possible (Warger, 1998).

ACCESSIBLE TECHNOLOGY IS IMPORTANT

Digital technology—the tools, systems, and devices that we use to work, communicate, and manage our day-to-day lives — has made life more comfortable. It was also supposed to blur the lines of race, gender, age, and ability, but technology has more work to do to become truly inclusive. Consider the issue of accessible technology for those with disabilities.

About 15 percent of people in the world have a disability, as reported in a recent CNET article. Data from the Centers for Disease Control and Prevention (CDC) reveals that about 1 in 4 Americans have a disability. Of those affected by disability in the United States, nearly 5 percent are blind or have a severe visual impairment, and almost 6 percent are deaf or have a severe hearing impairment. Others have difficulty with speech, mobility, or cognition; mental disabilities; or difficulties with self-care and independent living.

The Americans with Disabilities Act (ADA) focuses on improving accessibility for these individuals. While integrating technology accessibility into IT is a legal requirement, more importantly, providing equal access for all is the right thing to do. And with millions around the world under stay-at-home orders in response to the COVID-19 pandemic, ensuring that those with disabilities have equal access to the technologies that help us work and communicate is imperative.

CURRICULUM ADAPTATION AND TECHNOLOGY INTEGRATION

Technology integration is the incorporation of technology resources and technology-based practices into the daily routines, work, and management of schools. Technology resources are computers and specialized software, network-based communication systems, and other equipment and infrastructure. Practices include collaborative work and communication, Internet-based research, remote access to instrumentation, network-based transmission and retrieval of data, and other methods. This definition is not in itself sufficient to describe successful integration: integration must be routine, seamless, and both efficient and effective in supporting school goals and purposes.

Assistive and instructional technologies are a part of the larger research-based intervention strategies, that in terms of the accessibility to the general education curriculum, imply the modification of the classroom like equipping students with disabilities with graphic organizers or concept mapping software or allowing students who have difficulty writing to respond verbally to a peer rather than producing a written assignment, use of talking text readers, or specific assistive technology communication devices designed for receptive and expressive communication to ease learning and equal participation of all students with differential abilities (Reed and Bowser, 2005; Van, 2007; Warger, 1998).

Conclusion

Accessibility is a celebration of diversity and a crucial factor in ensuring students' participation in the learning process. Access to information, awareness, mainstream education curriculum, learning materials, assistive devices, and the necessary support services can help students with disabilities in learning at par with their non-disabled peers in the common classroom, breaking down all barriers which prevent them from having equal access to quality education. Research confirms the positive outcomes of inclusion in education, which is found to promote effectiveness in educational practice, delivering positive educational outcomes for children with disabilities in inclusive settings (Katz and Mirenda, 2002). Regular schools with an inclusive orientation are found to be most effective in combating discriminatory attitudes, building an inclusive society, and achieving education for all (UNESCO, 1994). Assistive technology should not be viewed by educators within a 'rehabilitative' or 'remediation context, but as a tool for accessing the curriculum, and exploring out means to help students achieve positive outcomes (Warger, 1998). For the proper and optimum use of assistive devices, it is essential to ensure need-based assessment - considering the applicability of the technology and its effectiveness; a sound development plan - ensuring student-centered goals and proper identification in the plan of the devices needed; successful implementation - through action-oriented approach to check the feasibility and effectiveness of the technology, with effective monitoring and periodic review. There is a distinct need for researchers, practitioners, and other stakeholders in the system to identify ways to encourage the development of tools and strategies for technology integration and strive to work together on issues surrounding the use of technology, for effective inclusion of students with disabilities within the general education environment, ensuring that they are entitled to the same high standards and effective instruction that is available to the non-disabled students. It is essential to focus and build on the strengths and capabilities of the students, with the necessary support and assistance, to give more room to their abilities to address their 'disabilities'.

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