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Assistive Technology for Learning Disabled – Making Room for Diverse Learning Needs

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ABSTRACT

For years, learners with diverse needs have struggled with their assignments or been shut out of different classes or subjects because schools had accessibility or instructional problems. The teachers understand the differences thoroughly as they have the better chance of meeting the diverse learning needs of all of their students. Nowadays learning technologies transformed educational systems with impressive progress of Information and Communication Technologies (ICT). With the integration of Information and Communication Technologies (ICT) in education, a growing interest is indicated in the educational use of the World Wide Web, implementing activities that support collaborative learning. Technological developments like Web 2.0 technology can enable learners with disabilities to improve their quality of life. They represent real opportunities with access to an inclusive education and help to overcome the obstacles they meet in traditional educational systems. This article reviews basic concepts of learning disabilities in classroom and assistive technologies, with a special focus on accessible e-learning systems and also outlines their pedagogical implications.

Keywords: Learning disability (LD), Assistive technology (AT) and Web 2.0

Introduction

According to the World Report on Disability, over one billion people worldwide have some form of disability, with over 150 million school-aged children among them. A number of these children are denied access to education and do not complete basic school. According to the UNESCO Global Report (2013), people with disabilities confront a variety of challenges, including lack of access to information, education, and work prospects. People with impairments can benefit from technological advancements by improving their quality of life (Arrigo, 2005). Classrooms may be more inclusive, physical surroundings more accessible, and teaching and learning content and approaches more in touch with learners' needs, according to the UNESCO Global Report (2013). Information and communication technologies (ICT) are a great instrument for supporting disabled people's education and inclusion. With the advancement of ICT, there is a greater need to improve the learning quality in education and training systems by addressing new perspectives and opportunities. E-learning emerges as the response to that demand, ensuring that students' learning needs are met in a personalised and inclusive manner (Ben Brahim et al., 2013).There is a lot of hope for e-ability Learning's to decrease barriers to education and enhance the lives of people with disabilities (Klomp, 2004).

ASSISTIVE TECHNOLOGY

Technology does not mean information and communication technology alone. The term "technology innovations" encompasses all aspects of classroom instruction. Children with impairments can be educated through a range of experiences, and inventive technology is required to create suitable learning environments. Technology has two aspects: technology in education and educational technology. Both types of technologies are significant in providing learners with learning opportunities. Assistive technology helps youngsters with disabilities enhance their functional abilities while also increasing their learning efficiency. Assistive technology is defined as "any item, piece of equipment, or product system, whether purchased commercially off the shelf, modified, or customised, that is used to increase, maintain, or improve functional capabilities of a child with a disability," according to the Individuals with Disabilities Education Act (IDEA, 1997). Helpful technology is a broad phrase that encompasses a wide range of assistive, adaptive, and rehabilitative technologies for people with disabilities, as well as nearly anything else that can be used to compensate for a lack of particular abilities (Reed and Bowser, 2005). These may include low-tech gadgets such as crutches or a particular pen grip, as well as more advanced things such as hearing aids and spectacles, as well as high-tech devices such as computers with specialist software for dyslexics (WHO, 2009).

Depending on their nature of usage and application, assistive technology devices can be used by students with disabilities on their own or with assistance, in and outside of the classroom environment. Assistive technology helps to close this gap by 'assisting' in the process of educating children with physical, mental, and developmental disabilities in the same classroom (Smith et al., 2005).

Assistive technology connects a student's cognitive abilities to an educational opportunity that might otherwise be unavailable due to a disability; for example, a student who has trouble decoding text can use a text-to-speech screen reader to bridge the gap between the written text and the ability to process information aurally and cognitively.

Graphic outlining software can also be used as a bridge to visual processing abilities for students who have trouble ordering their thoughts in text (Hernandez, 2003). Students can have more independence in accomplishing tasks that they were previously unable to or could only do with great difficulty if assistive technology is effectively integrated into the regular classroom.

It is not enough to simply provide these devices; youngsters and instructors should be given short-term training in how to use them. The fundamental principles must also be understood by the teachers.

PRINCIPLES TO USE ASSISTIVE TECHNOLOGY

The concepts underpinning the inclusion of this technology into the teaching – learning process were identified by Allan (2015).

• Assistive technology can only improve basic skills, not replace them, according to him. It should be used to teach basic skills as part of the educational process.

• Assistive technology is more than an educational tool for children with impairments. For non-disabled children, it is a basic work instrument comparable to a pencil and paper.

• Assistive technology allows children with disabilities to access and use standard tools, complete educational tasks, and participate in the regular educational environment on an equal footing with their developing peers. • Assistive technology does not automatically make educational and commercial software tools accessible or usable.

• A professional assistive technology examination is required to establish whether a kid requires assistive technology devices and services, and this information should be included in the children's educational plans. • To be effective, an assistive technology review should be a continuous process that addresses alternative and augmentative communication needs, that is, the ability to convey needs and change the environment for children with impairments.

It was said that by adhering to the aforementioned criteria, assistive technology improves the independence of children with learning difficulties, as these youngsters frequently rely on their parents, siblings, friends, and teachers for help (Raskind, 2000). Furthermore, assistive technology allows children with learning difficulties to complete specified tasks independently.

The majority of assistive devices are appropriate for each disability category, but there are some gadgets that are only appropriate for certain disability categories that are present in general classrooms.

DISABILITIES PRESENT IN THE CLASSROOM

In the classroom, disabilities are classified into four groups based on the type of impairment (Kavcic, 2005):

• Impaired mobility (limited movement or control of the arms, hands, and fingers): Physical limitations affect a person's capacity to move, manipulate objects, and engage with the physical world.

• Visual impairments (blindness, partial sight, and colour blindness): This category comprises conditions ranging from low vision to complete blindness, in which the user is unable to use the visual display. Although people with visual impairments have the most difficulty with information presented on screens (particularly visuals and graphical information), using a pointing device that needs eye-hand coordination (such as a mouse) may also be problematic for them.

• Hearing impairments (deafness and hearing loss): People with hearing impairments have trouble identifying sounds or separating auditory information from background noise. Individuals who are deaf are unable to receive any auditory information. These people communicate using a sign language that is quite different from spoken language.

• Cognitive impairments (including attention deficit disorder, dyslexia, dementia, and other cognitive, language, and learning disabilities): Cognitive impairments include problems with thinking, memory, language, learning, and perception, to name a few.

ASSISTIVE TECHNOLOGY FOR CHILDREN WITH LEARNING DISABILITIES

Children with learning disabilities are usually classified as having cognitive deficits.

A learning impairment is defined as a deficit in one or more of the basic cognitive capacities involved in understanding or using spoken or written language, according to the Individuals with Disabilities Act (IDEA). It causes problems with listening, thinking, speaking, reading, writing, spelling, and doing math calculations. Perceptual impairments, brain damage, mild brain dysfunction, reading problems, and developing aphasia are all included in this category.

Children with learning disabilities caused largely by visual, hearing, or motor impairments; mental retardation; emotional disturbance; or environmental, cultural, or economic adversity are not included in this category. These youngsters grow up with learning disabilities, but with the right teaching and resources, they can dramatically progress and reach their full potential (Raskind, 2000). Assistive technology (AT) is a gadget that makes it easier for a learner with a disability to execute a common task.

It is a tool that is used to help a child with a disability maintain or improve his or her functioning. The tool can be difficult to use (such as a complimentary communication device). According to Quenneville (2002), assistive technology has a lot of potential for children with learning difficulties, and it can help them improve their academic performance in writing, reading, math, and spelling, as well as improve their organisation and develop social acceptance.

Assistive technology is thought to give numerous benefits by making writing easier for children with learning impairments (LD), who typically find the writing process frustrating (MacArthur, 1996). It means it accommodates children with impairments' writing issues, allowing them to perform better in the classroom. The use of assistive technology in the classroom should be a collaborative effort between instructors and assistive technology specialists.

FACTORS TO BE CONSIDERED BEFOREPROVIDING ASSISTIVE TECHNOLOGY

Before implementing assistive technology, teachers should consider the following factors:

- The type and severity of the disability;
- The unique demands and obstacles that children with disabilities face
- Their academic skill areas in which they struggle
- Their strengths and the Assistive Technology that can be used to compensate for their impairment
- The locations and scenarios in which the Assistive Technology item will be used
- Additional contexts such as home, work, social gatherings, and recreational events where AT can help people operate better

TYPES OF LEARNING DISABILITIES ASSISTIVE TECHNOLOGY ADDRESS

AT tools can address many types of learning difficulties:

Writing

AT tools can help children having difficulty in writing. They can dictate a school report and have it turned into text using special software.Students who struggle with writing can benefit from a variety of assistive technology solutions. Some of these tools help kids avoid having to write, while others aid in proper spelling, punctuation, grammar, word usage, and organization

Listening

Children who have trouble understanding and recalling spoken language can benefit from listening assistive technology.These devices can be utilised in a variety of situations (e.g., a class lecture, or a meeting with multiple speakers).

Mathematics

AT tools for math are intended to assist students who have difficulty computing, organising, aligning, and writing down arithmetic problems on paper. Users can better set up and compute basic math problems with the use of visual and/or auditory support

Organization and memory

Students can use AT tools to organise, plan, and keep track of their calendar, timetable, task list, contact information, and other notes. With the help of specific software and hand-held devices, they can manage, store, and retrieve such information

Reading

Students with reading difficulties can benefit from a variety of assistive technology options. While each tool operates in a somewhat different way, they all assist by presenting text as speech. These technologies make decoding, reading fluency, and understanding easier.

ASSISTIVE TECHNOLOGY TOOLS AVAILABLE FOR LEARNING DISABLED

AT tools that support learners with LD include:

Abbreviation expanders

These are computer programmes that allow users to generate, save, and reuse acronyms for commonly used words and phrases. These can save the user keystrokes and ensure that the words and phrases he has coded as abbreviations are spelled correctly.

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Alternative keyboards

Special overlays on these programmable keyboards change the appearance and function of a normal keyboard. Customization that minimises input options, arranges keys by color/location, and adds pictures to improve comprehension may benefit students with LD or typing difficulties.

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Audio books and publications

Publications and audio books Users can listen to text in recorded books, which come in a variety of formats including audiocassettes, CDs, and MP3 downloads. Users can search and bookmark pages and chapters using special playback units. Subscription services provide access to large digital library holdings

Electronic math work sheets

Worksheets for arithmetic on the computer Electronic math worksheets are computer programmes that can assist a user in organising, aligning, and working through math problems. A speech synthesiser can also read aloud numbers that are onscreen. People who have issues aligning math problems with pencil and paper may find this useful.

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Freeform database software

Used in conjunction with word processing or other software, this tool allows the user to create and store electronic notes by "jotting down" relevant information of any length and on any subject. He can later retrieve the information by typing any fragment of the original note.

Graphic organizers and outlining

When starting a writing project, graphic organisers and outlining programmes might help people who are having problems organising and outlining information. This sort of tool allows a user to "dump" material in an unstructured manner before assisting him in organising it into proper categories and order.

Information/data managers

This sort of software aids in the electronic planning, organisation, storage, and retrieval of a person's calendar, task list, contact information, and other data. Personal data managers can be handheld devices, computer software, or a combination of the two that "share" data.

Optical character recognition

Recognition of characters using light A person can scan printed material into a computer or mobile device using this technique.
A speech synthesis/screen reading system then reads the scanned text aloud. OCR is available in a variety of forms, including stand-alone equipment, computer software, and portable, pocket-sized devices.

Personal FM listening systems

FM receivers for personal use the voice of a speaker is transmitted directly to the user's ear through a personal FM listening system. This may make it easier for the listener to concentrate on what the speaker is saying. The system consists of a speaker's wireless transmitter (with microphone) and a listener's reception (with earphone).

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Portable word processors

A portable word processor is a little gadget that is convenient to carry around (e.g., from classroom to home).It can be beneficial to children who have difficulty writing by hand and prefer to type. Word processing makes it easier for the user to revise and correct his written work than if he did it by hand.

Proofreading programs

Software tools that scan word processing documents and notify the user to possible issues (included in many word processing systems) may help with spelling, grammar, punctuation, word usage, and sentence structure.

Speech-recognition programs

A text processor and a speech recognition application operate together. The user speaks into a microphone, and his words appear as text on the computer screen. This is beneficial to a user whose vocal language skills are superior to his written abilities.

Speech synthesizers/screen readers

These systems can show and read aloud text on a computer screen, including text that the user has entered, text that has been scanned in from printed pages (e.g., books, letters), and material that has been found on the Internet.

Talking calculators

A built-in speech synthesiser in a talking calculator speaks aloud each number, symbol, or operation key pressed by the user. It also expresses the solution to the problem. This aural feedback may aid him in double-checking the accuracy of the keys he pushes and confirming the answer before transferring it to paper.

Talking spell checkers and electronic dictionaries

During the writing and proofreading process, talking spell checkers and electronic dictionaries can assist a poor speller in selecting or identifying relevant terms and correcting spelling errors. Talking gadgets read aloud and show selected words onscreen for the user to see and hear.

Variable-speed tape recorders

Tape recorders and players allow users to listen to pre-recorded text or to record and play back spoken information, such as a classroom lecture. Variable speed control (VSC) tape recorders allow the speaker's voice to be sped up or slowed down without distorting it.

Word-prediction programs

Word prediction software can assist a user with word processing by "predicting" a word that the user is about to input. Spelling, syntax, and frequency/recent use are used to make predictions. This encourages children who have difficulty writing to employ accurate spelling, grammar, and word choices while using fewer keystrokes. Other types of technology exist to assist all students, including kids with LD, in improving their academic achievement.

These technologies differ from AT in various ways, but they're nonetheless worth discussing. Specific academic skills (such as reading and writing) or subject matter content are taught using instructional software (such as history and science). It differs from AT in that it gives teaching instead of avoiding problematic parts.

Universal Design for Learning (UDL) is a philosophy that incorporates learning models, methodologies, and products in order to improve various learners' educational experiences (whether or not they have learning disabilities). In this method, AT is frequently integrated into instructional materials and can be tailored to help students with disabilities succeed in general education.

Apart from that, Web 2.0 applications have provided students with disabilities with unparalleled access to education and peer communities. For students with learning difficulties, these technologies have both social and educational implications.

Web 2.0 Tools and Learning Disabilities

Web 2.0 refers to new web technologies that allow students to create and change information online. The internet has evolved from a "read-only" to a "read-write" web (Gillmor, 2004). These pupils might benefit from some of the most popular Web 2.0 applications, including as blogs, wikis, and messaging.

Blogs

The format of a blog is similar to that of a journal or diary entry. Teachers can use their classroom blogs to post assignments, classroom notes, video lectures, and other classroom materials. This is excellent for the entire class, but it also allows a student who problems with attention or auditory processing to go over the subject again and again. Students can also use these classroom blogs to get handouts and assignment worksheets. Misplacing or forgetting coursework is a common problem for students with LD and ADHD.A classroom blog can help students stay organised by providing a central area for them to find key class material.

Wikis

A wiki is an online software tool that allows multiple users to collaborate and generate web content, typically for reference purposes. The most well-known example of a wiki is Wikipedia but there are many uses for wikis on the web. A classroom wiki could be used for a collaborative writing project. Students could be asked to edit a page on Wikipedia on a specific topic they're studying. Alternately, students could be asked to find a piece of misleading or incorrect information in a Wikipedia entry, leading to a classroom discussion on the dangers of completely open collaborative networks. Because wikis keep a record of every change made, a wiki could also be used for students to work on collaborative projects.

Text Messaging

Text messaging is one of the more popular pastimes on the planet, with as many as 2 billion estimated users worldwide. NASA has even taken text messaging out of this world by setting up a news feed site. Using Short Message Service (SMS), users can send and receive short text messages (up to 160 characters) on their mobile phones. Google SMS is one other easy to use tool that could be helpful for children with LD. Google SMS users can send a text message to search Google. Google SMS provides access to more in depth information. Teachers can send texts to their students reminding them of assignments, upcoming quizzes and other important events. The website sends reminders to the user by text, email, or instant message. Additional features allow users to locate tasks on a map, share tasks with others (helpful for group projects), and view tasks by due date and past due. This type of texting could help students with learning disabilities feel more comfortable with participating in classroom discussions. Allowing students to text their answers means students can think about what they want to say and get it just the way they want it.

CONCLUSION

Assistive technology should not be viewed by educators within a rehabilitative or premeditative context, but as a tool for accessing curriculum, and exploring out means to help students achieve positive outcomes (Warger, 1998).The purpose of using assistive devices is to enrich learning experiences of children with disabilities and also to augment their inclusive experiences in the society. Therefore, there is a distinct need for teachers, researchers, practitioners and other stakeholders in the system to be creativetoo in using and 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. It is also mandatory for effective inclusion of students with disabilities within the general education environment and 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 in order to address their disabilities.

REFERENCES

Arrigo, M.(2005). E-learning Accessibility for blind students, *Recent research Developments in Learning Technologies.*Retrieved on December 17.

Ahmad(2015).Use of Assistive Technology in Inclusive Education, *Transcience, 6(2),* 65.

Ben Brahim, H., Ben Jemaa, A., Jemni, M., & Laabidi, M., (2013).Towards the design of personalised accessible e-learning environments, *The 13th IEEE International Conference on Advanced Learning Technologies*, Beijing, China, July 15–18.

Gillmor, D. (2004). We the Media. California: O'Reilly Media Inc.

Klomp, R., (2004).A literature review of the accessibility of e-learning for students with disabilities. *Unpublished manuscript.*Retrieved on December 17.

Kavcic, A. (2005).Software Accessibility: Recommendations and Guidelines. *Eurocon,2*, 1024–1027.

Reed, P.,& Bowser, G.,(2005).Assistive Technologies and the IEP in Edyburn,D., Higgins K.

WHO(2009). "Assistive devices/technologies", Available at: http://www.who.int/ disabilities/technology/en/

Hernandez, M.T., Sauerwein, H.C., Jambaque, I., de Guise E., Lussier, F., Lortie, A., et al.(2003).Attention, memory, and behavioral adjustment in children with frontal lobe epilepsy. *Epilepsy Behavior, 4(5),* 522–536.

Smith, R.W., Austin, D.R., Kennedy, D.W., Lee, Y., & Hutchinson, P. (2005). Inclusive and special recreation: Opportunities for persons with disabilities (5th Ed.). Boston: McGraw Hill.

Warger, C. (1998). Integrating Assistive Technology into the Standard Curriculum. ERIC/OSEP Digest E568.

http://www.readingrockets.org/article/assistive-technology-kids-learning-disabilities-overview

https://www.humanrights.gov.au/publications/access-education-students-disability-barriers-and-difficulties

https://files.eric.ed.gov/fulltext/ED574881.pdf (https://files.eric.ed.gov/fulltext/ED574881.pdf)

https://www.allresearchjournal.com/archives/2016/vol2issue11/PartD/2-9-144-754.pdf (https://w

ww.allresearchjournal.com/archives/2016/vol2issue11/PartD/2-9-144-754.pdf)https://files.eric.ed.gov/fulltext/EJ1078825.pdf (https://files.eric.ed.gov/fulltext/EJ1078825.pdf)https://www.sciencedirect.com/science/article/pii/S1319157813000347 (https://www.sciencedirect.com/science/article/pii/S1319157813000347)

https://www.adlit.org/topics/technology/assistive-technology-kids-learning-disabilities-overview (https://www.adlit.org/topics/technology/assistive-technology-kids-learningdisabilitiesoverview)

https://www.greatschools.org/gk/articles/portable-word-processors/(https://www.greatschools.org/gk/articles/portable-word-processors/)

https://specificeducationalneeds.blogspot.com/2015/12/what-types-of-learning-problems-does.html (https://specificeducationalneeds.blogspot.com/2015/12/what-types-of-learning-problems-does.html)

https://www.brainline.org/article/blogs-wikis-and-text-messaging-what-are-implications-students-learning-disabilities (https://www.brainline.org/article/blogs-wikis-and-text- messaging-what-are-implications-students-learning-disabilities)

https://www.academia.edu/40022315/Use_of_Assistive_Technology_in_Inclusive_Education_Making_Room_for_Diverse_Learning_Needs(https://www.academia.edu/40022315/Use_of_Assistive_Technology_in_Inclusive_Education_Making_Room_for_Diverse_Learning_Needs)