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Role of Assistive Technologies in Education of Differently Abled Persons

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ABSTRACT
In recent years there have been some changes in the perception of society towards physically challenged, differently abled persons. It has been reiterated time and again that majority of these people can lead a normal life if they have effective access to services which would include early identification, intervention, education, vocational training, employment opportunities and the availability of aids and appliances. One of the most amazing developments in education over the past ten years was the way that technology created a revolution in possibilities for differently abled persons. Now a days the ICT based Assistive Technology (AT) plays a vital role in education of differently abled persons. This paper enlightens different assistive computer technology introduced for the differently abled persons.

Key word: Differently Abled, ICT, Assistive Technologies (AT).

I. INTRODUCTION

The rapid development and application of computer-based technology change in available options for disabled students, ending the isolation and limited opportunities faced by differently abled persons. Computer based programs have been designed to make it easier for differently abled personsto access material, communicate their ideas and work, and participate in educational experiences.

While Braille reading and writing techniques have helped blind or visually-impaired students continue their education since the nineteenth century, new assistive computer technologies (AT) that include mobility, hearing, and visual aids make Braille, as revolutionary as it was, pale in comparison.

The advent of online learning in particular has created greater accessibility for the many students for whom traditional college courses and college campuses previously presented obstacles to easy accessibility [Europium Commission (2008)].

It is very important to ensure that students with disabilities are prepared to meet the challenges of postsecondary settings (Stodden, Conway, & Chang, 2003); many technological tools could increase, as much as possible, the possibilities for students with disabilities to overcome these challenges with fewer difficulties. In many cases adapting the right assistive technology for students with disabilities could save time and effort. Ignoring the existence of devices and tools that can help students with disabilities facilitate and maximize their educational and academic gains can also prevent students from having opportunities to reach their maximum performance, or at least to make them more confident while undertaking some tasks that can be done easily using low-tech assistive technology.

II. TYPES OF DISABILITIES

There are many kinds of disabilities and that new technologies have been introduced to assist those who possess one or more of them. The most common disabilities, fall under these categories:

2.1Physical:

Physical disabilities may require the use of braces, a cane or a wheelchair, may use prosthetic limbs, or may be dealing with muscular dystrophy, Lou Gehrig's disease, multiple sclerosis, or many other conditions, all of which can present accessibility challenges.

2.2 Sensory:

Sensory disabilities include visual impairment and blindness, deafness and hard-of-hearing conditions can prevent students from utilizing traditional classroom materials and tools.

2.3 Cognitive:

Cognitive disabilities can be all over the map in terms of intelligence, but may suffer from difficulties with memory, self-expression, information processing, and other learning disabilities that prevent them from performing their

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academic tasks in the same manner as other students.

2.4 Psychiatric:

These disabilities include a broad spectrum of challenges, from social phobias to bipolar or other personality disorders that make it difficult for them to maintain consistency in their academic work or personal life.

2.5 Health-related:

Suffering from chronic conditions such as diabetes or epilepsy, or other diseases such as cancer often experience difficulty attending class regularly.

Although each condition is different, and some students deal with more than one, all students with disabilities face numerous challenges in the traditional classroom environment. These challenges can include being unable to travel quickly from building to building for different classes on a college campus due to a physical disability, or difficulty using the same learning formats as other students [Meijer, C. J. W. 2010].

III. ASSISTIVE TECHNOLOGY (AT)

Information Technology and Electronics is at the heart of this revolution in learning opportunities for differently abledstudents, because they are the basis of **Assistive Technology (AT)**. In the United States, AT was defined and encoded into law as part of various disabilities protections designed to equalize education. AT was defined in a way that is consistent with the development and use of assistive technologies around the world:

"Any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities. AT service is directly assisting an individual with a disability in the selection, acquisition, or use of an assistive technology device".

In other words, someone wearing a hearing aid, using a prosthetic limb, employing speech-to-text software or other tools, they are using assistive technology.

In India RCI (Rehabilitation Council of India), & UGC have released guidelines for Universities and colleges to make campus barrier free, to use assistive technologies in classrooms and to make accessible website for differently abled.

3.1 Some Assistive Technologies (AT)

New forms of assistive technologies are often nothing short of miraculous. For example, you have seen the footage of theoretical physicist and world-famous genius Stephen Hawking gave a lecture to a huge student audience.

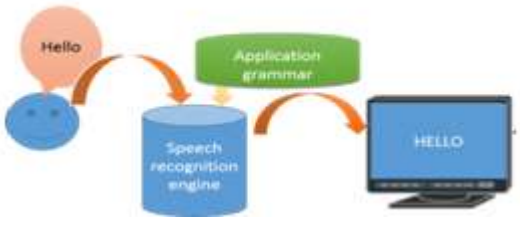
Hawking suffers from amyotrophic lateral sclerosis (ALS) and has almost no ability to move or speak on his own. Instead, he uses speech-generating technology in which computer software translates what he types on a keyboard into a synthesized voice. In addition, the computer software includes auto-correct, so that he only needs to type a few letters before the computer recognizes and types out the entire word for him.

Stephen Hawking is one of the best examples of how assistive technology has changed education. Without AT, Hawking would not have been able to make his contributions [Mononen, Jukka,Halonen, Rajja, 2014].

Hawking may be the most famous user of assistive technology, but there are so many new forms of assistive technology for every category of disability available, some of them are given hereunder:

3.1.1 Speech- to- text-Recognition software:

Student's coping with blindness/visual impairment or with physical limitations that stop them from writing on a keyboard, will use text-to-speech devices to compose their assignments. Once exploitation these programs, students speak into a mike, that then interprets their words into written documents. The foremost well-known of the software package programs that perform this task is Dragon Naturally Speaking that conjointly acknowledges voice commands like "insert punctuation."



3.1.2 Text-to-Speech software:

This assistive technology helps students with visual impairments by allowing them to listen

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to the text that appears on a computer screen. This is a huge improvement over Braille because once the program is installed on the computer, it can read anything on the screen, no matter what format it is in with no waiting for a Braille translation.

3.1.3 Visual Aids:

This class of technology includes screen magnification code that enlarges parts of the screen, wherever the reader directs the mouse, screen reader code that interprets screen text to Braille, text-to-speech programs, audio texts. All of those are employed by students of the many completely different types of visual disabilities.

3.1.4 Audio Aids:

These aids include sound amplification tools, alerting devices that use flashing lights or icons on the computer screen rather than sounds to signal users, close-captioning for videos, TTY (TDD) also known as Telecommunication for the Deaf, phones enabled with Voice Carry-Over (VCO) technologies that allow to students with hearing difficulties to communicate over the phone with their own voice.

3.1.5 Physical Aids:

For persons with physical mobility, stability, motor coordination, and range of motion challenges, several technologies are available to assist them in completing their schoolwork, including audio books for students who cannot physically handle books; keyboard adapters such as keyguards to prevent mistyping from tremors or loss of control, voice recognition software for students who cannot type.

3.1.6 Online education

However disabled students should never be barred from any learning environment, like all students, some do function better in an environment with limited distractions and more accessibility than might be available in many classrooms or on very large campuses [Andreassen, T. A. 2012].

Online education is that students with behavioural disabilities, who have difficulty concentrating among the normal distractions of a classroom, or emotional challenges that prevent them from maintaining appropriate classroom behaviours, can create environments in which their ability to focus will not be compromised.

IV. EXAMPLES OF ACCESSIBLE TECHNOLOGIES

Burgstahler (2003) pointed out three examples of accessible electronic and information technology and how it can be useful for differently abled students in educational settings, based on the concept of universal design: 1) Accessible web pages such as those that allow students with low reading skills to access information and communicate with others; 2) Accessible instructional software, such as programs that allow students to work side-by-side and collaborate with their peers to complete assignments in the classroom; 3) Accessible telephones that make communication accessible to everyone, whatever their disabilities.

V. ASSISTIVE TECHNOLOGY FOR EDUCATIONAL NEEDS

Technology could play an important and significant role, in many cases, in helping students with disabilities overcome the academic difficulties that they face and helping them to develop their academic skills as well. 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 students with mild disabilities. And, the results showed that the impact on most of the seven students was positive.

Another example of the important role that technology can play in helping students to overcome their difficulties with academic skills can be found in the study conducted by Bouck, Doughty, Flanagan, Szwed, and Bassette (2010) to

examine how effective a pentop computer (a FLYPen) and the writing software (specifically designed for the FLYPen) was in assisting students with disabilities in writing. They concluded that technology-enhanced procedural facilitators not only can benefit the quality and quantity of written expression in students with mild disabilities, but it can also enhance students ability to plan their writing and help them complete these tasks more independently.

Mclnerney, Riley, and Osher (1999) examined six projects that have been conducted on students with hearing disabilities, and they found that text highlighting and supportive captions with digital instructional materials were helpful to and demonstrated consistent academic gain for students with hearing disabilities.

VI. CONCLUSION:

Due to the role of AT, the days are over when differently abled students are shunted off into inaccessible classrooms, without the ability to participate in the regular routines of education and develop social relationships with their peers. The basic feature of computer-based assistive technology (AT) is that it is focused on accessibility and offers almost limitless flexibility, making it adaptable to all variety of disabilities. This endless opportunity is truly what education should be all about, for everyone. Now it is high time to support the differently abled persons through Assistive Technologies for minimizing the revealing disorder in them.

There are a few points that summarize the important principles that should be considered in the integration of technology in educating or training students with disabilities i.e. low tech tools should be the first option when looking for assistive technology; educators must search among the available tools and devices first before looking for tools that were specially made for educational purposes, which could be very costly (Skylar, 2008); small adjustments to existing technologies, often, will make a difference for students with disabilities (Johnston et al., 2007); for example, the highlight and enlarge functions, and programs that color important words in the text or buttons on websites will be helpful (Mclnerney et al., 1999).

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