ICT AN ABILITY FOR DISABLED STUDENTS: INDIAN CONTEXT

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The belief that "The Disabled are not really disabled but differentially able" is true in every sense, and I know each of us must have come across some such able student.

Abstract: We all see many people around us who are physically challenged. The first thought came in our mind is that they cannot do anything or they will never grow up in their life. On the other hand, when we talk of Technology, it is continuously exploring new and new things, which make our life much simpler and easy going. Technology, also consider these kinds of individuals and is trying to make their lives easier and simpler so that they can also be treated as a knowledgeable person and to make them stand with the normal man. Technology develops various tools and techniques for better learning and enhancing knowledge through Interactive Communication Techniques (ICT). There are various tools provided with this technique, which help the visually impaired students who want to see their life in a different manner. .

Keywords: Visual Impaired Students, ICT Tools, Training System, Learning Aids

Introduction

History has witnessed many famous people who have and had visual impairments but this lacuna does not stop the ways of their success: Helen Keller, Franklin Delano Roosevelt, the very renowned name Louis Braille is known to virtually everybody. He became an inventor and designed Braille writing, which enables blind people to read feeling a series of organized bumps representing letters. This concept was beneficial to all blind people from around the world and is commonly used even today. If it were not for Louis Braille's blindness, he may not have invented this method of reading and no other blind person could have enjoyed a story or been able to comprehend important paperwork. New technological innovations have also put inputs in this direction. The invention of ICT (Interactive Communication Technique) is the new dimension to teach the visually impaired.

Although there are various types of disabilities like Visual Mental Disability, Visual Impairment, Hearing Impairment, Physical Disabilities, Multiple Complex and Others.

The above-mentioned categories of persons have special needs arising from the nature of their problem. To address these needs specialized education services are required. This paper deals more with the help and availability of ICT for Visual Impaired students.

Problems with Vision Impaired Students

Vision is the primary integrating sense and plays a vital part in learning. It is estimated that up to 80% of learning is visual. Students with vision impairment need instruction in the traditional academic areas as well as in disability specific skills. These students have specific needs to enable them to access the curriculum. This includes the adaptation of the regular curriculum- both content and strategies use of adapted teaching methodologies and the delivery of an expanded core curriculum, which includes keyboarding and technology skills.

Vision Impaired students may need special equipment and materials to participate fully in classroom learning programs. They need to develop the necessary skills to become lifelong learners, to access Global communication and to participate fully in an ever-increasing technology focused world.

ICT for Them

Computers have revolutionized life for disabled people. They are used by:

- Severely disabled people to communicate;
- Dyslexic people;
- The blind and visually impaired;
- Those with learning difficulties.

The advent and accelerated progress of technology**,** not to mention a social change in attitude resulting in disabled students being integrated into the mainstream school systems, has drastically changed the options for disabled students.

In theory and principal, disabled students now have access to technology which somewhat levels the playing field between them and their non-disabled peers.

This technology enables disabled students to become more independent and contribute on an equal basis than ever before. This integration facilitates the acceptance of disabled people as their non-disabled peers. Their colleagues and coworkers are first hand witnesses to their skills and potential.

Key Points to ponder

1. Individuals may customize the required learning curve to fit their own needs and abilities.
2. Stimulates creativity and encourages cooperation between students
3. Assistive technology surmounts the disability and allows individuals to participate on level playing field.
4. Guiding principles for selection of special education software

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5. Does the software empower the user? That is to say, does it enable the user to do something he or she wants to but could not otherwise do?
6. Does the software address the goals of the student's Individualized Education Program (i.e., does the software give the learner access to the curriculum?
7. Is the software adaptable? If the program is truly adaptable, learners will be able to enter their own problems, and teachers will be able to suit the program to different learners. Programs should allow physically disabled learners to use switches or games paddles, possibly at a slower than normal speed, and visually impaired learners to use a speech synthesizer.
8. Does the software offer cues and appropriate reinforcement? Users do not favor programs that simply suggest 'try again' or do not respond at all. When the learner enters the wrong answer, He or she necessitated personalized feedback (for each learner).
9. Is the program easy to use? Must many commands be memorized? If a manual is essential, children and adults with learning difficulties may not get very far.
10. Is the program's text, onscreen and in print, big enough and clear enough? Teachers criticize programs with small print and no color. Large, sharp-edged print onscreen can be vital to sight-impaired learners.
11. Even when the 'right' software is available, there is no cast-iron guarantee that computer technology will help every pupil who has learning difficulties.

ICT for pupils with disabilities

Work on ICT and Special Educational Needs (SEN) is fragmented, but ten main functions of IT in relation to pupils with SEN can be discerned:

1. Interaction, using devices activated by movement, such as sound beams.
2. Communication, involving witches operated by head pads, devices activated by a puff of air or muscle contraction or speech synthesizers.
3. Physical control, poor bladder function and epileptic fits may be controlled sufficiently, using technological devices, to enable pupils experiencing these difficulties to participate in inclusive classrooms.
4. Access to the normal curriculum, a vast array of devices linked with hardware, e.g. alternative 'mouse' devices, or manipulation of software variables, e.g. figure-ground contrast, key sensitivity, are giving pupils access to curricula from which they would have been barred previously.
5. Subject-linked learning, including image manipulation, art appreciation using museum- or gallery-based packages, simulations, databases, models, multimedia presentations, problem solving. Those with learning difficulties may need additional features such as a facility for interrupting or pausing the program, clear on-screen instructions at every point and minimum requirements about time on the program.
6. Certain pupils may enjoy working on a computer because it frees them from interacting with other people, but teachers may have reservations about encouraging such isolation;
7. IT skills, including keyboard skills, word processing, use of spreadsheets, information retrieval, correspondence using email, self-presentation through home pages on a website.
8. Record keeping, for pupil use such as records of work completed. Individualized timetables or teacher use such as managing Code of Practice stages or records derived from Integrated Learning Systems.

ICT Projects in India for Disabled Persons

India has some forty to eighty million people living with disability, among them thirty percent of them ate children below the age of fourteen years. To make the education system more effective, government has promised to include disabled children in all its educational programs, including the Sarva Shiksha Abhiyan and the Integrated Child Development Scheme (ICDS).

Today there are more than three thousand special schools in India; nine hundred are schools for the hearing impaired, four hundred for children with visual impairment, seven hundred for those with locomotors disabilities, and one thousand for the mentally disabled. The government of India is continuously making rigorous efforts for educating the physically challenged students by imparting latest technological tools used for their learning.

In India ICT is being used not only for disabled but also for underprivileged students and adults. Some such work being done is *"India IT Freedom Project for visually challenged students".*

Hailed as a gift of technology to blind schoolchildren in the State, the India IT Freedom Project was launched with the joint participation of the State Government, Freedom Scientific Inc USA, the Devnar Foundation for the Blind and Karishna Enterprises in Mumbai.

The first of its kind in the country, the project aims to benefit over 2,500 blind students in the State pursuing education in 20 schools. A professional training program is currently underway, with teachers, as deputed by the State Government being trained in computer software in 6-week training courses at the Devnar Foundation.

The Government is also providing free computers for 20 blind schools in the State. It took six months to put

together the project. With the introduction of the screen reading software, Job Access with Speech (JAWS) developed by Freedom Scientific, it was possible to train blind children of eighth, ninth and tenth classes in computers.

Added to this, Magic Magnification Software for low vision children was developed, along with Open Book OCR Reading Software and a Braille printer. The project will help blind students write examinations without the help of a scriber, as they can convert the reading material from the Braille script into normal form and vice versa. Plans to introduce a similar project for the benefit of university students and for secondary schools in other parts of the country are also underway.

IBM Provide Free ICT Training for Disadvantaged Students

IBM is working with Bhavan Vidya Bhavan (BVB) through the Gandhi Institute of Computer Education and Information Technology (GICEIT) to provide free IT training for students from disadvantaged backgrounds. This program helps in bringing elementary computer literacy to participants from rural India, giving practical, vocational training such as in e-mailing, word processing, designing spreadsheets, business graphics and other related business applications. Local language interfaces have been devised using specialized software to make the learning experience more meaningful. More than 3,000 students in 15 schools have already benefited from the program.

Hole-In-The-Wall Training Systems

The International Finance Corporation, a World Bank subsidiary has invested $1.6 million in a project called 'Hole in the Wall', where computer kiosks are being placed in urban slums and street children with almost no education are teaching each other on the use of computers. The project encourages underprivileged children in India to learn from a web-based curriculum through Internet kiosks, which will be installed in more than 60 locations over the next few years. The aim is to improve education for poor children, ensuring equal access for girls and boys. The project began in early 1999, on the initiative of Dr. Mitra, who heads research and development at the National Institute for Information Technology Limited (NIIT), a leading computer software and training company in New Delhi.

Just outside his office is a high-speed computer was placed in the wall, connected to the Internet, and watches whom, if anyone might use it. To his delight, curious children were immediately attracted to the strange new machine. Within minutes, the children had figured out how to point and click. By the end of the day, they were browsing.

The Seelampur Project: Empowering Slum Women with ICTs.

The Intel Computer Clubhouse Project with Katha for slum people.

ICT Services in India for Disabled Students

The Digital Information Research Foundation (DIRF) has been involved in enabling the disadvantaged or disabled to get integrated in the main stream of life.

The DIRF has conducted workshops and training programs for disabled students at different institutions in Chennai.

The main centre for the ICT for Disadvantaged program is the St. Louis Institute for the Deaf and Blind & College for the Deaf located at Chennai. It is a reputed institution for deaf and blind functioning since 1962.

DIRF plans to create a portal for disabled; the portal will serve the needs of disabled. The portal will collect all the needed information to the disabled particularly to the deaf that would sever as a tool for self-learning and help to make the disabled people independent and self-supportive. The integrated approach will be employed and we would like to create a regional network of disable people particularly the deaf students.

From Teachers View

- Teachers were convinced that the Internet was a powerful tool to draw children into reading, writing, and learning. They described many benefits but also many barriers.
- Some teachers say that students do not have enough on-line time and that connections are slow or unreliable.
- Other teachers simply do not have appropriate seating/were hindered by small computer screens.
- A few very resourceful teachers have developed their own adaptations and researched access strategies to accommodate students with different disabilities.
- Using multimedia, which combines visual and auditory learning with teacher student interaction both reduce costs and increase achievement.
- "Having Internet access has been like having a pot of gold in my classroom," describes a special education resource teacher for students with learning disabilities. Students can receive information in two or three different ways, the better off they are as many students are auditory learners.
- It is found from teachers that auditory learners in class benefits when they can hear text spoken aloud in addition to reading it on the computer screen. A variety of hardware and software make the computers in the classroom "talk." This same technology has also helped a student with a visual impairment, whose work has improved noticeably since students and teachers started using the Web to research her homework assignments.

ICT Tools

1 Computer Access Aids

Hardware and software products that enable persons with disabilities to access, interact with, and use computers at home, work or school. It includes modified or alternate keyboards, switches activated by pressure, touch screens, special software, voice to text software, etc. Common sub-categories are:

1.1 Alternative Input Devices

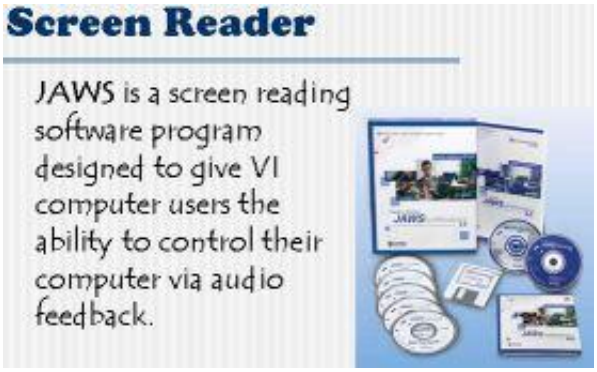
Includes alternative and adaptive keyboards, expanded keyboards, key guards, alternative and ergonomic mouse/pointing systems, head-operated pointing devices, Eye glaze pointing devices, mouth/tongue pointing devices, Morse code input devices, brain-actuated pointing devices, switches, touch screens, voice input systems, speech-to-text software, voice recognition/voice command software, dictation software, on-screen keyboards, cursor enlargement software, ergonomic computer-based equipment, etc.

1.2 Alternative Output Devices

Computer-based output devices that generally enable Blind and Vision impaired persons to use or interact with a computer. This includes Braille display/output devices, Braille embosser/printers, screen reading software, screen magnification/enlargement software, large print monitor, etc.

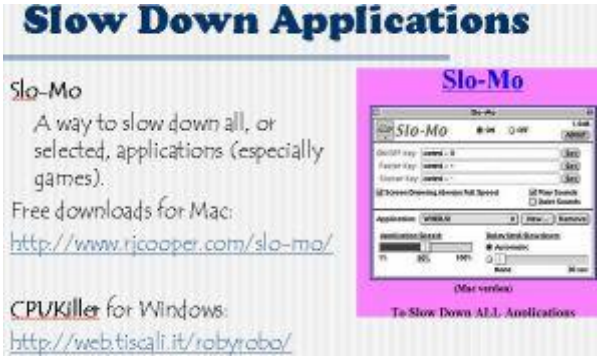
1.3 Accessible Software

Includes software applications adapted for children and adults with disabilities, operating system accessibility options, accessible web browsers, etc.



Software that are being generally used:

- Jaws
- MS Office
- Magic 8
- Typing programs



Hardware being used:

- Large screen computer monitor
- Closed Circuit TV (CCTV)
- Hand held magnifier
- Laptop
- Telescope
- Binoculars
- Mountbatten Braille
- Talking calculator

Use a large monitor -- at least 17 inches

- Allows use of the computer for group learning.
- Allows font enlargement for users with low vision and those with learning disabilities.
- Provides large print on screen without the need to scroll down and across web pages for users with limited hand coordination.

A trackball as an alternative to the mouse

- Helps younger students and those with limited fine motor skills.
- Helps children with limited coordination.
- Helps computer uses with tremors or spastic movements.
- Can help to reduce repetitive strain injuries.

2 Education and Learning Aids

2.1 Cognitive Aids

Includes cognitive software focusing on categorization, matching, association, reasoning, decision-making, problem solving, memory skills, perceptual skills, talking word processing, word prediction/completion software, cognitive retraining or rehabilitation tools.

- **E-Clips Writer** is a software application, which enables users to turn virtually any electronic text document into a Digital Talking Book.
- **Digital Talking Books** (DTB's) allow the blind, dyslexic, and other print disabled individuals to literally "hear" and browse written content. eClipse Writer uses a synthetic voice application from NeoSpeech, Inc. to automatically generate and add realistic human sounding voices to its Digital Talking Books. A Digital Talking Book, most often recorded on a CD, plays back on computers or specialized players, allows users to quickly search and locate chapters, subchapters, paragraphs, and phrases as with a printed document. For sighted or partially sighted users, DTB's also display text synchronized to the voice playback, which makes for a powerful learning and comprehension tool. More importantly, the product also creates audio "books" that play back on standard consumer CD players.

2.2 Communication Aids

Products and equipment designed to help persons with speech disabilities or writing difficulties to communicate. At its very simplest, augmentative communication can be a page with picture choices or alphabet letters that a person points at. It can also involve highly sophisticated speaking computers with on-screen

communication boards and auditory or visual scanning. Common sub-categories are:

2.3 Speech and Augmentative Communication Aids

Alternative and Augmentative Communication (AAC) involves alternate methods of communicating needs, feelings, ideas, and perceptions through the use of electronic and non-electronic devices that provide a means for expressive and receptive communication for persons with limited or no speech. It includes communication boards, speech synthesizers, text-to-speech software and hardware, head wands, light pointers, mouth sticks, signal systems, telephony equipment, etc.

2.4 Library facility for the Vision Impaired – the Beep

A project was undertaken which has been cited here to study the Extension - an adjustment of the Digital Library of the University of Cyprus to cover the information needs of blind users. The *Installment of two PCs Workstation with adaptive equipment at the Library of the University of Cyprus.*

a. Adaptive workstation for the very Blind users

b. Adaptive workstation for the partially sighted users

The implementation of the appropriate ICT (adaptive workstations) combined with the availability (identification and/or preparation) of digital content and the training of people involved (library staff and blind users) results to the support for the disabled, and the accessibility of the blind people to the Higher education.

To non-registered users – You need to register to fully exploit the Beep knowledge system. Without registering, you can undertake a full search to see how the system works, but you will not be able to access the full details of any cases selected, nor access the Beep learning resources. Registering only takes a few minutes. Within 5 minutes, you will receive your own personal password. You can change this to a password of your own choice during your first login by clicking on 'Your Settings'.

Registration is FREE. You only need to provide your name, country, e-mail address, your interest in Beep and where you heard of Beep.

Conclusion

Here I conclude taking in view the barriers, which are being faced, and their solution to make the disabled much more able by use of ICT.

1. ***Barrier:*** Written text is difficult to comprehend for students with learning disabilities.
   Solutions: Text reading software reads text aloud from the computer. Font enlargement makes the text easier to read.
2. **Barrier:** Textbooks and other print materials are often unavailable in electronic formats. ***Solutions:*** Scanner and optical character recognition software convert books into electronic format. Text reading software reads aloud text in the computer.
3. ***Barrier:*** Computer screen is inaccessible to students with visual impairment.
   Solutions: A 17-inch monitor helps with screen enlargement programs. Software enlargement programs magnify text and graphics to a greater degree than the computer's built-in font options.

Information Communication Technology can help these children overcome many of their communication difficulties, so they can be included in lessons, and access a wider curriculum. Different access devices can help learners with physical difficulties to use a computer, and enable them to access the same curriculum as their peers. Software designed to meet a student's particular needs can also help to motivate him or her. For some students technology may be the only way to ensure they can make their thoughts and needs known. For them, access to appropriate ICT-based solutions provides perhaps the only chance of participating in society and realizing their full potential. Although India has a growing disability rights movement and one of the more progressive policy frameworks in the developing world, a lot more needs to be done in accomplishment and getting the basics right. The most important thing to remember is that *a learning-disabled student does not lack intelligence.* In fact, these students are most commonly above average in IQ. What makes them different is *the way they learn.* That is all!

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