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Expending Horizons Of Ict: Ict For Children With Special Needs

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Abstract

The use of computer based technology has become the need of the day due to different reasons. The teachers of today employ various information communication technology (ICT) supported methods and materials in the classrooms to enhance the teaching-learning process in a more effective way. As we are entering into the era of inclusion and as it has become the fundamental right of each child to be educated, children with special needs are being enrolled in the regular schools through the centrally sponsored scheme of the Government of India called Sarva Shiksha Abhiyan.

Special-needs children include those who have: Mental Retardation, which causes them to develop more slowly than other children. Speech and Language Impairment, problems such expressing themselves or understanding others. Physical Disability, such as vision problem, cerebral palsy, or other conditions. Learning Disabilities, which distort messages from their senses. Emotional Disabilities, such as antisocial or other behavioural problems. With proper care and education, every child can reach his or her full potential. More the parents and teachers understand about how a child grows, the better they'll be prepared to recognize special needs and seek help promptly. Children with special needs require extra attention, teaching, care and love.

The role of Information and Communication Technology in educating children with special needs: Educating all students by today's standards and for tomorrow's living most certainly includes the use of technology. Its relationship in providing essential supports for students with disabilities in areas of self-care, education, employment, recreation/leisure, and community living are readily accepted. Additionally, access to technology can provide meaningful learning experiences to develop problem solving and higher order thinking skills and to function in the world beyond the classroom. The appropriate and successful integration of technology into learning environments has the potential to benefit all students.

Since, the professionals/teachers in the regular schools lag in the skills to teach the children with special needs, the knowledge about the ICT supported teaching methods for the disabled children would be of great boon to them to handle the entire class without any discrimination.

Today we are in the era of inclusion. In almost every country, inclusive education has emerged as one of the most dominant issue in the education of students with special education needs. In the past 40 years, the field of special needs education has moved from a segregation paradigm through integration to a point where inclusion is central to contemporary discourse.

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Inclusive education is a strategy based on human rights and democratic principles that confronts all forms of discrimination. Inclusive education is concerned with removing all barriers to learning, and with the participation of all learners vulnerable to exclusion and marginalization. It is a strategic approach designed to facilitate learning success for all children.
Hence, it becomes the duty of a regular teacher to handle children with special needs along with normal children in his/her classroom. So the ICT, which he/she uses, should also meet the diverse needs of children with disabilities such as children with learning disabilities, mild intellectual disability, autism, hearing impairment and visual impairment. The role of Information and communication technology in educating children with various special needs is discussed in this study.
Key words: Information and Communication Technology, Children with special needs.

Introduction

ICT is technology that supports activities involving information. Such activities include gathering, processing, storing and presenting data. Increasingly these activities also involve collaboration and communication. Hence, IT has become ICT information and communication technology. Information and communication technology (ICT) has become, within a very short time, one of the basic building blocks of modern society. Many countries now regard understanding ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing and numeracy.

This paper reports on study of the use of Information and Communications Technologies (ICT) to aid in the teaching of students with learning disabilities. The term 'learning difficulties' is used in reference to a heterogeneous group of students who are seen to have significant difficulties in the acquisition of literacy and numeracy skills. Other terms sometimes used in this context are learning disabilities and Children with special needs.

The use of computer based technology has become the need of the day due to different reasons. The teachers of today employ various information communication technology (ICT) supported methods and materials in the classrooms to enhance the teaching-learning process in a more effective way. As we are entering into the era of inclusion and as it has become the fundamental right of each child to be educated additionally, access to technology can provide meaningful learning experiences to develop problem solving and higher order thinking skills and to function in the world beyond the classroom. The appropriate and successful integration of technology into learning environments has the potential to benefit all students.

Inclusive education is a strategy based on human rights and democratic principles that confronts all forms of discrimination. Inclusive education is concerned with removing all barriers to learning, and with the participation of all learners vulnerable to exclusion and marginalization. It is a strategic approach designed to facilitate learning success for all children. Specifically with special

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needs learners ICT is used to support the development of reading and writing skills, but also as a tool to develop social relation skills. CT supports children who find it difficult to access curriculum, perhaps due to physical, mental or just concentration problems. ICT can help, sometimes by using modified equipment but sometimes simply by the motivation it offers. But the benefits of ICT go much further than this and extend all the way to providing complete access for children who would otherwise be denied an education altogether.

Discussion and Analysis

In order to build a truly inclusive information society, educational approaches and appropriate technology must be developed that meet the requirements of all users, including those who have special educational needs. Access to appropriate ICT can reduce inequalities in education and ICT can be a powerful tool in supporting educational inclusion. However, inappropriate or limited access to ICT can be seen to reinforce inequalities in education faced by some pupils including those with special educational needs. The principle guiding the availability of access to information in ICT in SNE should be that all levels and types of information should be accessible to all – that is open in terms of content and technological format to as many different audiences as possible.

There are many ways in which technology can support learners with disabilities or learning difficulties, and help them to access learning which they may otherwise be excluded from, or find difficult to participate in every classroom activity and societal issues.

Every child is an individual and children with Special Educational Needs are as different from each other as any other children, perhaps even more so. Even if a child has had a 'label' attached to his/her particular special need, this does not mean that his/her needs will be exactly the same as others with the same condition. In all types of disability, the difficulties can range from mild to severe and many children will have problems in more than one area of learning.

Main types of impairments

1. Physical impairments
2. Sensory impairments
3. Speech and language impairments
4. Specific learning difficulties
5. Cognitive impairments

Physical Impairments:

A physical impairment affects the ability to move or to coordinate and control movement when performing tasks. A physical impairment may also affect the ability to use or feel certain parts of the body. There is a wide range of conditions that may result in a physical impairment. Such as cerebral palsy, muscular dystrophy, arthritis, osteogenesis imperfect, congenital malformation of the limbs, some acquired brain injury, some orthopaedic conditions. Some chronic health and/or

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medical problems such as burns or cancer may also affect a student's physical development, resulting in impairment.

A physical impairment may be present from birth (congenital) or acquired later through an accident or illness and progressive or non-progressive.

Sensory impairments

Visual impairments

Visual impairment represents a continuum, from people with very poor vision, to people who can see light but no shapes, to people who have no perception of light at all. However, for general discussion it is useful to think of this population as representing two broad groups: those with low vision and those who are legally blind.

Hearing impairments

Hearing impairment means any degree and type of auditory disorder, while deafness means an extreme inability to discriminate conversational speech through the ear. Deaf people, then, are those who cannot use their hearing for communication. People with a lesser degree of hearing impairment are called hard of hearing.

Speech and language impairments

Speech disorders (developmental or acquired)

Language disorders (developmental or acquired)

A speech-language impairment involves the neurological, cognitive and/or physical structures and functions specific to speech-language processing. The impairment relates to a student's capacity in speech/language comprehension and/or production that significantly impacts on the student's educational progress compared with their age cohort.

Specific learning difficulties

Some of the learning difficulties arises due to Dyslexia, Dysgraphia, Dyscalculia, and Attention deficit. The symptoms of learning disabilities are a diverse set of characteristics which affect development and achievement. Some of these symptoms can be found in all children at some, these symptoms which do not disappear as s/he grows older. Most frequently displayed symptoms Short attention span, Poor memory, Difficulty following directions, Inability to discriminate between letters, numerals, or sounds, Poor reading or writing ability, Eye-hand coordination problems, Difficulties with sequencing, Disorganization and other sensory difficulties.

Cognitive impairments

It includes memory, perception, problem-solving, conceptualisation and attention deficits. This may result from a range of conditions such as mental retardation, autism, brain injury, Parkinson's disease, Alzheimer's disease and old age.

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How ICT can help Children with special needs

Physically impaired students

These students usually must rely on assistive devices which take advantage of their specific abilities and on their ability to use these assistive devices with standard products. Commonly used assistive devices include mobility aids (e.g., crutches, wheelchairs), manipulation aids (e.g., prosthetics, orthotics, reachers) communication aids (e.g., single switch-based artificial voice), and computer/device interface aids (e.g., eyegaze-operated keyboard). Poor muscle control or weaknesses can make using standard keyboards and mouse devices difficult. For instance, some people are unable to type two keys simultaneously, while others tend to hit multiple keys or to bounce keys when pressing or releasing them. People who are able to use only one hand likewise have difficulties with some keyboard and mouse tasks. ICT has long been established as an important enabling tool for some learners with physical disabilities. Pupils may, however, require specialised equipment to gain physical access to the computer and, for many, a multi-professional assessment is an essential starting point. Moreover, once the equipment has been chosen it is necessary to position it so that the pupil can use it comfortably.

Visually impaired students:

A choice of word processor fonts enables a learner to select the most suitable letter shape and size, while the opportunity to select text and background colours on screen can help to make viewing more comfortable.

Screen glare can be alleviated by the use of filters but care should be taken that lighting in the room does not interfere with the screen display.

High-contrast sticky labels with large letters can be fixed over the keys of the standard keyboard. Labels in a variety of textures or colours can be attached to frequently used keys. Braille keyboard computers are also available.

The ability to print out in various sizes is useful because work can be printed out in a large font for the user and a smaller one for the teacher.

Screen layouts can be designed to meet individual needs so that a pupil can load software and files independently, and edit and save work.

Text-to-speech software can read out text on the screen. Digital sound can be recorded and used in multimedia applications. Calculators, thermometers and electronic dictionaries are all available with in-built speech.

A scanner with optical character recognition software can import a page of text into the computer. This can then be copied into a word processor.

Braille-translation software can produce text and Braille versions. Pupils can obtain both Braille and standard text print-outs for their audiences.

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The use of mouse pointers and pull-down windows on screen can present problems for learners with low vision but many use keystroke alternatives to the mouse moves. Access utility programs are available for most computers.

Work is in progress to enable access for visually impaired pupils to the large amounts of information available on CD-ROMs and the internet. Screen magnification, screen navigation utilities and speech output are just a few of the utilities available. Pupils can use the computerised search and retrieval routines with the text enlarged or spoken via a speech synthesiser. Once they find the information they require, pupils can print outthe material.

Hearing Impaired students

The primary difficulty for individuals with hearing impairment in using standard products is receiving auditory information. Not being able to hear computer prompts, like beeps and spoken messages, can be problematic for these individuals. This problem can be compensated for by presenting auditory information redundantly in visual and/or tactile form. If this is not feasible, an alternative solution to this problem would be to provide a mechanism, such as a jack, which would allow the user to connect alternative output devices. Increasing the volume range and lowering the frequency of products with high pitched auditory output would be helpful to some less severely impaired individuals.

Familiar coping strategies for hearing impaired people include the use of hearing aids, sign language, lip-reading and TDD's (telecommunication devices for the deaf). Some hearing aids are equipped with a "T-coil" as well, which provides direct inductive coupling with a second coil (such as in a telephone receiver) in order to reduce ambient noise. Some other commercial products could make use of this capability. ICT can be of particular value in developing the language experiences of learners with hearing impairment. It is a very visual medium and the opportunity to work on pictures, signs or texts on screen allows pupils to extend their understanding and use of language without being dependent on the spoken word. Learners who have a hearing impairment often need opportunities to extend their use of language in order to describe, compare and contrast objects - skills that underlie effective information handling. Collaborating on an ICT activity can encourage a group of pupils to extend their use of language and their understanding of concepts as they plan and carry out their work.

Cognitive/language impairments

For people with these impairments, things like complex or inconsistent displays or word choice can make using computers more difficult. There are very few assistive devices for people with cognitive impairments. Simple cueing aids or memory aids are sometimes used. As a rule, these individuals benefit from use of simple displays, low language loading, use of patterns, simple, obvious sequences and cued sequences.

Learning difficulties

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The 1993 Education Act defines a child with a learning difficulty as one who has a significantly greater difficulty in learning than the majority of children of the same age. This definition covers a wide spectrum of need ranging from children with moderate difficulties to those whose difficulties are much more profound.

Supportive word processing with spellcheckers and speech feedback can support the development of literacy.

Word banks with graphics clues can be presented either on screen or on an overlay keyboard, providing instant access to specialist vocabulary. By selecting whole-word, whole-phrase or even whole-sentence insertion, the writer can concentrate on content.

Software designed to reinforce spelling, memory or numeracy work can be valuable if the exercises are chosen to link in with current class work.

Information-handling programs with their emphasis on describing, classifying and analysing, provide opportunities for language development.

For many learners, alternative methods of input to the computer such as switches, touch-screens, joysticks and trackerballs may provide easier access.

Sending messages to the computer by a sound- activated switch can encourage children to vocalise. Using suitable software and blowing or speaking into the microphone, they can change the picture on the screen or create patterns in response to their voices.

By pressing a switch attached to the computer learners can control what is shown on the screen, turning sounds on and off or changing pictures. In doing so they are gaining experience of cause and effect.

Multimedia can present information in a variety of ways with graphics and sound as well as text. This creates opportunities for learning which are not dependent on the written word.

A symbol processor links symbols to words, making written information more accessible and encouraging youngsters to write themselves from an overlay keyboard or an on-sc

Emotional and behavioural difficulties

ICT can motivate learners with emotional and behavioural difficulties and help them to increase their self-esteem. Learning may have become associated with the fear of failure, both in their own eyes and in the eyes of those around them. The computer can provide a non-threatening setting in which to experiment, with the pupils themselves controlling the pace and level of progress. ICT can also be used as a tool for developing social conventions such as turn taking and discussion that can be helpful for learners who often find it hard to establish relationships.

The word processor can provide the learner with the opportunity to experiment, in the knowledge that the final product can always be printed out in an attractive layout and type style.

Spell-checkers and word banks can build confidence in the poor speller.

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Adventure games allow students to develop their problem-solving skills, to test out ideas and to think logically. They can also cause frustration, but it can be argued that it is better to give vent to these frustrations in a controlled environment.

Multimedia techniques, combining photographs and scanned images generated by the student or taken from outside sources, can be combined with recorded sounds and personal writing to create powerful images. In this way students can reflect their own culture, enhancing their credibility with their peers and reinforcing positive self-images.

Analysis

ICTs are now more readily used to enable children, often for the first time, to take control of their own education and communication needs. With numerous adaptive technologies available on the market, there are fewer reasons why a child with special needs cannot be given the opportunity to develop educationally, as would have been the case if he/she had not had a disability. Disabled children want the opportunity to develop and participate in their society, to contribute, and not merely be regarded as a hindrance to the society.

The role of information and communication technology in educating children with special needs is educating all students by today's standards and for tomorrow's living most certainly includes the use of technology. Its relationship to providing essential supports for students with disabilities in areas of self-care, education, employment, recreation/leisure, and community living are readily accepted. Additionally, access to technology can provide meaningful learning experiences to develop problem solving and higher order thinking skills and to function in the world beyond the classroom. The appropriate and successful integration of technology into learning environments has the potential to benefit all students. As states and schools work to implement the requirements of educational reform required by the No Child Left Behind Act, 2001, they must ensure that all students are included, in particular students with disabilities.

Conclusion

Education can be made much more effective and accessible to persons with disability by including assistive technology products and services into the system. Text books used by students can be converted to digital talking books and be made available for the print impaired (people with learning and visual impairment). Computer aids such as screen readers, adaptive keyboards and desktop magnifiers can have a major impact in the education of persons with disability. The primary problem that needs to be addressed is the limited access to technology for people with disabilities. In education and day-today life, assistive technology is not available to the persons with disabilities. This hampers them in their education and growth. Many schools in India are not even aware of available assistive technologies, and thus the use of these technologies is minimal in schools across the country. Also, one needs to work on training the special educators so that they are aware of the technology and how it can benefit the students. Children are taught many

skills, concepts and activities as part of their education and some of these may be difficult to accomplish for disabled children. Assistive technologies can help in ensuring that the medium of instruction can be sufficiently modified to help disabled children overcome these challenges that are part of their education. These technologies will empower children to actively participate in their classrooms and ensure that they are provided a well-rounded education. It has been observed that assistive technologies can play a vital role in the education of children with special needs as well." "Assistive technology is very useful in the education sector; may it be for visually impaired, mobility impaired or students with learning disabilities". A visually impaired person, who can't read a physical book, can scan the same and read it using a computer with the help of screen reader such as Non Visual Desktop Access (NVDA). They are able to attempt their examinations using the computer, instead of depending on a scribe to write for them and this will in fact, improve their output quality too. A mobility impaired student, who can not write using a pen can use voice recognition software on the computer. A learning disabled person, who can not read text, can learn with the help of graphics, available through computer based AAC devices, like the Aavaz from Invention Labs.

Science and technology has always been instrumental in bringing efficiency and improvement in the processes and products of the human work. The world of education has influenced by the increased use of technology. It has provided valuable help in improving the task of the professional/teacher smoothening the process of teaching-learning and enriching the goals of management/education for children with and without disabilities. Hence, ICT plays a major role in managing/educating children with diverse needs and it becomes mandatory for every professional/ teacher to equip themselves with sufficient knowledge and necessary training in ICT for handling children with special needs.

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