Electronic Journal of Education, Social Economics and Technology
Vol. 3, No. 2, (2022), pp. 70–74
ISSN 2723-6250 (online)
DOI: https://doi.org/10.33122/ejeset.v3i2.96

SAINTIS publishing

Literature Review Article

Information and Communication Technology (ICT) for Children with Special needs CWSN

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ABSTRACT

All students, regardless of gender, race, colour, ethnic or social origin, genetic traits, language, religion or belief, political or other opinions, participation in a national minority, property, birth, or disability, everyone has the right to an equitable education (Klironomos et al., 2006), and to be considered as being an integral part of the learning community. To view Universal Access to Education as a concrete and attainable goal, teachers must be aware of the ICT potential and be able to acquire the necessary knowledge and operational skills to select and use ICT as an appropriate and promising tool for promoting equity in educational opportunities by assisting children with special needs in overcoming barriers to learning, thereby increasing their school achievement, as well as their autonomy and willingness to learn. The paper highlighted the definition of ICT, types of ICT items and how ICT is being used and describe the benefits of ICT to students with special needs.

Keywords: ICT; children with special needs; inclusive education; assistive technologies

1. INTRODUCTION

Education is essential for an individual's/overall child's development. Parents, teachers, and the government are all working hard to ensure that children receive a high-quality education. It is not a complex problem to provide education for normal children but, in the case of children with special needs It is the most complex problem for both parents and teachers to provide a basic education. It is widely accepted that in people with special educational needs, New Technologies manage to overcome obstacles and alleviate students' shortcomings and deficits in order to approach knowledge, but also to remove isolation by restoring social reality after allowing them to communicate. with its environment and its interaction with it. (Fytro, 2005) The OECD study entitled "Learning to Change: ICT in Schools" (2001) clearly demonstrates how ICT is changing the face of education and the students' learning experiences, With the help of ICT, it is easy to handle children with special needs for effective learning. There is no doubt that ICT has a pivotal role in teaching and learning of children with special needs. When it comes to the education of students with special needs, it is regarded as a priority (Lozano, Alcaraz & Bernabeu, 2012). Education incorporates technology as an integral component of the system. The role of technology in education as ICT is enormous, and the contribution of concerned teachers is equally important (Draft NPE, 2016). With the help of ICT, it is easy to handle children with special needs for effective learning. There is no doubt that ICT has a pivotal role in teaching and learning of children with special needs.

Information and Communication Technology

Information and communications technology (ICT) is a more comprehensive word that emphasises the significance of communications in current information technology. It is frequently used as a synonym for information technology (IT). ICT encompasses all technical means for handling data and facilitating communication, including computer and network hardware as well as required software.

Children With Special Needs

Children With Special Needs (CWSN) are students who, for a number of reasons (intellectual, physical, social, and psychological), face learning challenges that are greater than those faced by the majority of learners their age. These students require more educational support and guidance. Since the 1980s, inclusive education has tried to improve academic learning, social competence and skills, attitude transformation, and healthy peer connections for students with special needs in inclusive settings. "The education of disabled children should be an integral part of the education system," said the Kothari commission (1964–66), India's first education commission. The commission advised that integrated programmes be experimented with in order to enrol as many youngsters as possible (Alur, 2002).

Inclusive education

Inclusive education refers to a system of education in which all pupils are treated equally in the learning process. Inclusive education is a method of improving the educational system's ability to reach out to all students. It entails reorganising school culture, policies, and procedures in order for them to respond to the diversity of pupils in the affected area. It is one of the most efficient means of promoting a tolerant and inclusive society. Inclusive education is an approach for making education universal, regardless of the learner's impairment, and for maintaining societal justice. It emphasises how special needs children can be integrated on a holistic platform without feeling isolated. Instead of segregating children with special needs and confining them within the boundaries of special schools, inclusive education experts advocate for their inclusion in regular schools.

Inclusion of Students

Inclusion of students with learning disabilities in regular schools is part of the global human rights movement. All students, regardless of their individual characteristics or difficulties, have the right to an education. The investigators have referred many reviews related literature to understand the accessibility and application of ICT for children with special needs. Few studies were mentioned here to understand and use of ICT for children with special needs for effective teaching and learning. Jin-Pang Leung (2005) found that Computer assisted instruction (CAI) was used for improving the efficiency of simple addition computation in children with mental retardation. Moore and Calvert (2000) explored the impact of computers on vocabulary acquisition of young children with autism. Alcade and Navarro et al (1998) examined that Computer-assisted learning can be an efficient learning teaching procedure for children with intellectual disabilities In the computer, children with autism were more attentive, motivated, and learned more vocabulary than in the behavioural programme. National Institute for the Mentally Handicapped (1993-1996) created a computer-assisted instruction (CAI) package for teaching arithmetic and reading skills to children with mental retardation. Adaptive technologies such as Braille keyboards and speaking programmes such as JAWS are used to provide user interface within Microsoft tools. According to Baglama, Haksiz, and Uzunboylu (2018), ICTs increased students' motivation to learn with hearing impairment. The researchers also found that ICT could have positive effects on the literacy skills of hearing-impaired students. Furthermore, for students with disabilities, ICT could develop students' literacy and communication skills Alotaibi and Almalki (2016). Furthermore, Lidström and Hemmingsson (2014) suggested some tools that can be used such as soft and hardware for text-generating and speech generating to aids communication for students with hearing impairment. They also suggested using computer with special multimedia application. Williams, Jamali, and Nicholas (2006) proposed four ICT tools for special needs students, including the internet, virtual learning environments (VLE), augmentative and alternative communication (AAC), and adaptive devices for students who have difficulty using ICT devices.

Information and Communication Technology for Children with Special Needs

The actual miracle of technology may be its potential to help persons with disabilities overcome previously insurmountable barriers" (Simon, 1991). ICT fosters independence by enabling children with special needs to complete tasks that they were previously unable to complete. Children with learning disabilities now have a voice thanks to a specially designed wearable computer. Devices and services comprise assistive technology. An assistive technology device is a piece of equipment that assists a person with a disability in increasing, maintaining, or improving functional capabilities.

Assistive Technologies (ATs) are classified into the following categories:

a. No-tech tools
b. Low-tech tools
c. High-tech tools

These tools will be used in accordance with strategies that are tailored to a student's needs, abilities, and tasks.

Gadgets for Childrens with Special Needs

a) Visual Impairment: Braille shorthand machine, Distance vision telescopes Hand held magnifiers, KNFB portable reader for blind people Talking dictionary and Smart Cane.
b) Speech Impairment: Delayed Auditory Feedback (DAF).
c) Hearing Impairment: Advanced Digital Speech Audiometer, Hearing Aid and Wireless FM Assistive Listening System.
d) Locomotors Impairment: Battery Powered Joystick, Operated Wheelchair, Aluminium Crutches, Ankle Brace for ankle support, Prosthetic limbs, Cervical Immobilizer, Child Model Tricycle, Folding Sticks and Folding Walkers.
e) Mental Retardation: Basic Skill-Wooden Puzzles, We can (daily living activities), Calendar of Seasons and Punnarjani.
f) Cerebral Palsy: Sanyog, Gupshup and Switches.

Assistive Technology (AT) for Inclusion

Examples of some AT to help PWDs in education includes

a) Braille Duplicators and Writers,
b) Group Hearing Aid for classrooms,
c) Alternative & Augmentative Communication software/devices,

d) Multi-Sensory systems,
e) Tactile mathematical devices,
f) Web-Portal, Edu sat and M-Learning,
g) Web-cast and Online learning,
h) On demand examination.

First ICT lab for Disabled Children

a. Commemorating International Software Freedom Day on September 19, an Indian NGO launched the first ICT lab for disabled children on 22 September 2009.
b. The activity lab equipped with educational software's will develop simple games for autistic children to help them learn and communicate.
c. The first-of-its-kind ICT activity lab for children with autism and other disabilities has been opened in the capital city.

Express Buzz/Lab for autistic children launched

a) Insight, which intends to employ Information and Communication Technology (ICT) for the development of the differently abled in the state, has set up the lab fully on Free Software.
b) The lab was inaugurated by Vivek, a physically-challenged boy, on Saturday, on the occasion of the International Software Freedom Day, 2009.

Use of ICT

Autistic Children

Educational tools like GCompris and programming interfaces like Scratch have been found to be very helpful in developing autistic children's learning capacities and communication skills.

Visually Challenged

Since May 2007, Insight has been providing ICT training and resources to visually impaired people in the state. The lab will be a continuation of the company's initiative to make ICT more accessible to individuals with impairments.

Mobility Impairment

A person with a mobility impairment can operate a computer using technologies such as an adaptable keyboard with four times larger buttons or mouse alternatives such as the Trackball Mouse.

Cognitive or Learning Impairment

Literacy software solutions can help people with cognitive or learning disabilities who have trouble reading, writing, or spelling, or who have Dyslexia. It translates scanned printed documents and contains Optical Character Recognition (OCR).

Benefits of ICT

General ICT benefits

a. Enables greater learner autonomy.
b. Unlocks hidden potential for those with communication difficulties.
c. Enable students to demonstrate achievement in ways which might not be possible with traditional methods Enables tasks to be tailored to suit individual skills and abilities
d. Easy-to-access Course Material-Multimedia/easy-to-understand course material can be placed on the internet for learners to access at their leisure.
e. Motivation-Computer-based instruction can provide students with immediate feedback and explanations of right solutions. Furthermore, a computer is patient and non-judgmental, which can encourage students to keep studying.
f. Broad Participation-Learning materials can be used for long-distance learning and are available to a larger audience.
g. Improved student writing-easier It's for students to modify their written work, which can lead to better writing quality.
h. Easier learning of subjects-Many various types of educational software are conceived and developed to assist users in learning specific subjects/topics.
i. A more adaptable framework for measuring and improving outcomes. It can be easier to monitor and manage student work with correct organisation, as well as swiftly assess necessary changes to the instruction to improve student learning.

ICT benefits for students

a. Computers can help students gain more independent access to education. (Moore and Taylor, 2000; Waddell, 2000)
b. Students with special educational needs can complete tasks at their own pace. (ACE Centre Advisory Trust, 1999);
c. visually impaired students can use the internet in the same way that their sighted peers can. (Waddell, 2000);
d. Students with severe and multiple learning disabilities can communicate more effectively. (Detheridge, 1997);
e. Voice communication aids help students gain confidence and social credibility at school and in their communities. (Worth, 2001);
f. Students' increased ICT confidence encourages them to use the internet at home for schoolwork and recreational purposes. (Waddell, 2000).

ICT benefits for teachers, non-teaching staff

a. Reduces isolation for teachers working in special education by allowing them to communicate with colleagues electronically. (Abbott and Cribb, 2001; Lewis and Ogilvie, 2002);

b. Supports professional practise reflection through online communication (Waddell, 2000);
c. Staff skills have improved, as has their understanding of the access technology used by students. Collaboration with peers improves professional development and the effectiveness of ICT use with students. (Detheridge, 1997; Lewis and Ogilvie, 2002);
d. Materials that are already in electronic form (for example, from the Internet) can be more easily converted into accessible resources like large print or Braille. (Waddell, 2000).

ICT benefits for parents and carers

a. Parents and caregivers are encouraged to have higher expectations of their children's sociability and potential level of participation when they use voice communication aids. (Worth, 2001).
b. ICT tools assist parents and caregivers in reducing stress and pain associated with caring for children with special needs.
c. ICT tools help children with special needs learn more effectively. Parents and caregivers can easily manage students to teach at home/centre.
d. Children with special needs require a unique environment for refreshment. ICT tools assist parents in providing such an environment for students with special needs.
e. Parents and caregivers can assess their children using a variety of ICT tools.

How ICT can enhance teaching and learning in Special Educational Needs

Some students in your class may be experiencing learning difficulties as a result of a physical disability, a problem with their sight, hearing, or speech, emotional or behavioural issues, a medical or health issue, or difficulties with reading, writing, speaking, or numeracy. The use of ICT is critical in allowing students with Special Educational Needs to access the curriculum. ICT can be used to: provide switch access to classroom activities such as matching, sorting, and word processing; translate text into speech and speech into text; and prepare work that is specially adapted with large fonts, symbols, and specific colours for students with physical and sensory disabilities. This will provide students with some independence in participating in activities as well as the ability to work in an environment that encourages play and investigation. For students with learning disabilities, using ICT can: provide a clutter-free working environment where programme features are linked to students' ability enhance the development of activities that are clear, focused, and appealing to students, allow students to practise skills in a different context, allowing numerous repetitions to aid learning support language development activities and offer multi-sensory ways of learning offer a medium for differentiation. Using ICT caw for students with emotional and behavioural difficulties Provides a non-threatening or non-judgmental environment for students, allows students to be motivated and offers opportunities for success, allows students to be responsible for their own learning, and allows students to work on tasks that are more manageable and achievable.

2. CONCLUSION

It has been suggested that technology can serve as a kind of cognitive prosthesis to overcome or compensate for differences among learners, making it a great equaliser for many children with special needs. This concept has significant implications for learners with disabilities and special educational needs because it implies that technology can help create conditions for equal opportunity to learn and equal access to the curriculum for all. A brief reflection on what makes some classroom practises more educationally effective than others hints at where to look for a better understanding of effectiveness in the use of ICT in schools. Science and technology have always been important in bringing efficiency and improvement to human work processes and products. The increased use of technology has had an impact on the world of education. It has been of great assistance in improving the professional/task teacher's by smoothening the process of teaching-learning and enriching the goals of management/education for children with and without disabilities. As a result, ICT plays a significant role in managing/educating children with diverse needs, and it has become mandatory for every professional/teacher to equip themselves with adequate knowledge and training in ICT for dealing with children with special needs.

RECOMMENDATIONS

a. Adoption of effective ICT use for students with special needs should be encouraged at all educational levels.
b. In-depth research studies on the use and application of ICT devices for various categories of students with special needs are required.
c. The government should train every special education specialist in computer applications, and teacher education institutions should make computer literacy a mandatory requirement for special education teachers in regular schools.
d. Adequate funds should be made available for the proper procurement and maintenance of existing ICT devices.
e. The government, school administration, non-governmental organisations (NGOs), special education professionals, and other stakeholders are expected to collaborate and work as a team to identify the various areas of need of various categories of people with special needs, as well as to select technologies that will be appropriate and beneficial to them.
f. Special education teachers should be adequately trained to understand the use and applicability of ICT devices to various categories of people with special needs, to make appropriate adaptations, to make useful suggestions and recommendations to parents on the best ICT devices, to provide maintenance services, and to adapt instructional strategies that will promote effective learning.

AUTHOR'S CONTRIBUTIONS

The author considered the design and analysis, collected the data, performed the analysis, and wrote the paper.

CONFLICT OF INTEREST

The authors have no conflicting interests of any kind in the submission of this research paper.

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