



CHAPTER 24

INFORMATION COMMUNICATION TECHNOLOGY (ICT) ISSUES IN EDUCATION OF PEOPLE WITH DISABILITIES (PWDs)

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Introduction

People with disabilities (PWDs) are among the most vulnerable and excluded in the world, with education systems and services failing to meet their needs in terms of access and quality. According to World Health Organization (2011), students with special educational needs (SEN) achieve lower educational levels than non-disabled students. This influences subsequent opportunities, as students with SEN are more likely to suffer high unemployment rates, poverty, and wage discrimination (O'Keefe, 2007; Fuchs, 2014). The exponential development of ICTs (Information and Communication Technologies) throughout the world is a real opportunity to improve the educational inclusion of these children. UNESCO (2006), stated that, the prosperity of the emerging society is determined to a large extent by its ability to engage ICTs in education hence, ICTs offer a great potential to support lifelong learning for all categories of learners, including those with special educational needs.

Omede (2014), defined ICT as, pieces of equipment, networked infrastructure and the associated knowledge and the skills for creating, manipulating, transferring and using information or knowledge. UNESCO (2002) also defined ICT as, the range of technologies that are applied in the process of collecting, storing, editing, retrieving and transfer of information in various forms. Similarly, the National Policy on ICT 2019, defined ICT as, the art and applied sciences that deal with data and information. It encompasses all (equipment including computational machinery - computers, hardware, software, firmware etc., tools, methods, practices, processes, procedures, concepts, principles and the sciences) that come into play in the conduct of the information activities: acquisition, representation, processing, presentation, security, interchange, transfer, management, organization, storage and retrieval of data and information. ICTs make it possible for a classroom to be enhanced with individual learning events, allowing teachers to provide greater flexibility and differentiation in instruction. Special Education teachers (SET) can use ICTs to offer a variety of learning opportunities and approaches that engage, instruct, and support the special needs students with a myriad of tactics designed to appeal to their



peculiarities.

Obani (2006), defined special education as, the practice of educating students in a way that accommodates their individual differences, disabilities, and special needs. By this, he implied an individually planned and systematically monitored arrangement of teaching procedures, adapted equipment and materials, and accessible settings. Moreover, Florian and Hegarty (2004) stated that, special education needs covers an array of problems from those related to particular impairments to those related to learning and behavioural difficulties experienced by some learners compared with other similar learners. He further added that, special education (SE) aims to provide accommodated education for disabled students who have learning disabilities, learning difficulties, communication disorders, emotional and behavioural disorders, physical disabilities, developmental disabilities and other disabilities. He also reiterated that, SE is designed to provide additional services, support programmes, specialized placements or environment needed to cater for PWDs in order to minimize the psychological trauma derived from their various disabilities.

Experience has shown that, the impact of disability on individuals could be cushioned through the intelligent application of ICTs. The usefulness of ICTs in special needs education(SNE) manifests in at least four dimensions: instructional, environmental, human resources and the learner technologies however, the bottom lines are, how can ICTs help to facilitate effective instruction in SNE?, can ICT alleviate the environmental challenges confronting persons with special needs?, in what ways can ICT empower the teaching and support staff in special needs education?, what technologies are relevant and suitable for use by special learners to ease their education?

Based on the raised issues, this chapter discusses the following topics: overview of ICT in education of PWDs, challenges of ICT in the education of PWDs, ICT benefits:(students, teachers, non teaching staff, parents and care givers), prospects of ICT in education of PWDs, accessing the internet: keyboard and mouse issues, ICT and social inclusion of PWDs, accessing the curriculum, and ICT resources to support education of PWDs.

Overview of ICT in Education of PWDs

The educational needs of people with disabilities are vastly diverse. On the one hand, they must, as their peers, get knowledge and skills required in the society in which they live. On the other, they have additional demands caused by functional limitations which affect their ability to access standard educational methods of instruction, therefore, preventing their educational progress (UNESCO, 2006). In this context, ICTs application is very important as it plays an essential role in providing high quality education for students with disabilities; improving quality, support curricular changes and new learning experiences. In this way it is possible to meet the specific learning needs of different learner groups, including students with disabilities. For special needs education, ICT is need specific. The



nature and extent of special needs informs the type of ICT tool to employ. For instance, children with hearing impairments may require tools such as voice synthesizers and hearing aids to effectively communicate in the classroom.

Education cannot be said to have taken place where there is no communication. Similarly, a child with visual impairment will require embossed braille computers, lens optician, ultrasound canes to be able to effectively function in a formal educational setting. It is important to note that, beyond helping special children to function in an educational setting, ICT is crucial to their existence as whole beings, if they must lead near normal and independent lives. Indeed, if there is any benefit ICT confers on individuals generally in any respect, be it educationally, socially or otherwise, PWDs stand to reap such benefits in a hundred fold. The provision of personal computers, electronic libraries, and a virtual world confers a lot of benefits for special needs children who can access all their research materials and meet their learning needs practically sitting at one spot without having to contend with the mobility challenges that otherwise attends the non-electronic alternatives to these utilities.

The internet is by far the greatest ICT tool with inexhaustive advantages and a door to limitless opportunities. In fact, to the extent that one is seeking information and knowledge, one can say that the internet “answereth to all things”. The relevance of the internet to special needs education cannot be overstated especially its encouragement of individualized instruction and independent study programme (IEP) which permits exploration, experimentation and self-discovery. Ironically, the internet is often out of reach of children with special needs as a result of several factors, but sometimes also due their disabling conditions. It is therefore plausible to x-ray the challenges of the use of ICT in special needs education.

Challenges of ICT in the Education of PWDs

Speedy development of Information Age brings possibilities and dangers to people with special needs. While it can be very empowering, providing for a chance to be involved in the society otherwise inaccessible to the disabled, it can also create new threatening barriers excluding them even more. Those who have unequal access to information run the risk of losing some of the most basic rights. If the technology is inaccessible to the PWDs, or the principal information is processed in such a way that some groups of people with special needs are excluded from its access, Information Society will finally turn out to be a threat for such people. Moreover, the digital divide, on its own, will further intensify social exclusion. There are some notable challenges in the course of making the right choice of technology for the education of children with special needs. According to UNESCO (1994) PWDs form the poor of the poorest in the society. Some of the challenges that hinder individuals with special needs from acquiring or getting easy access to ICT services are:

High cost of equipment and gadgets that would enhance effective and independent functioning.



Lack of knowledge on the technical know-how of the equipment. Most of the equipment or machines are foreign or imported, and with little or no prior computer literacy, it may take a long time to master how to manipulate them.

The maintenance and repairs of the equipment. Sometimes when the machines are faulty, the replacement of damaged parts becomes difficult because they may either be out of stock or difficult to get a knowledgeable technician to do such repairs. At other times, the model of such machines might have been obsolete as well (Ajobiewe, 2009).

Inadequate power supply: in some parts of Nigeria, there is an epileptic or no power supply at all. This could hamper the use of some of these technological tools such as desktop computer, electronic travel aid, scanner software, and even portable computers that require electricity to keep it charged and or functioning.

Teacher's attitude: with the early years education, attitudes towards ICT can vary considerably. Some see it as a potential tool to aid learning whereas others seem to disagree with the use of technology in early years settings. Teachers who were not trained in ICT tend to have a negative attitude towards it.

ICT Benefits:

Students with Disabilities

Over the last few years, the computer has turned into a valuable resource for teaching students with a wide range of learning difficulties. Rapidly grown processing power has let manufacturers provide sophisticated hardware and software to get the access and meet the learning needs. Engaging special needs students in ICTs learning-teaching activities will enable them learn more effectively, communicate better, interact well with their non-disabled peers and gain self confidence (BETCTA, 2003 & UNESCO, 2006).

ICT enables special needs learners develop greater learner autonomy;

unlocks hidden potential for those with communication difficulties;

enables 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.

Students with special educational needs are able to accomplish tasks working at their own pace;

Visually impaired students using the internet can access information alongside their sighted peers;

Students using voice communication aids gain confidence and social credibility at school and in their communities;

Increased ICT confidence amongst students motivates them to use the Internet at home for schoolwork and leisure interests.

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SNE Teachers and non-Teaching Staff

ICT reduces isolation by enabling them to communicate electronically with



colleagues;

Supports reflection on professional practice via online communication

Enhances professional development and the effectiveness of the use of ICTs with students through collaboration with peers;

Materials already in electronic form (for example, from the Internet) are more easily adapted into accessible resources such as large print or Braille.

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(c) Parents and Care-Givers

Use of voice communication aids encourages parents and care-givers to have higher expectations of children's sociability and potential level of participation. ICT enhances some measure of independence for persons with special needs thereby relieving parents and care-givers the burden of taking care of their last bit of needs.

Prospects of ICT in Education of PWDs

In spite of the challenges encountered in the application of ICT in the education of special needs children, its remarkable impacts on education of same children are undeniable. There is a growing awareness that people with disabilities have the right to enjoy same standards of service and access as every other member of their society. However, disabled people must overcome their additional obstacles for them to benefit maximally from ICT and its benefits such as information, services, entertainment, and social interaction.

Blind people need appropriate hard- and software to be created, for example, a text as an alternative to images. The text can be translated into an audible format by specially designed screen-reading devices or made accessible by the means of printed braille text;

People with low vision may use technology with the help of large-format text and effective colour contrast;

People who are dyslexic or have cognitive impairments may benefit, in particular, from the use of simpler language or alternative text formats, such as Easy Read, as well as from the clear and logical layout of an uncluttered structure of information; people, whose first language is Sign Language, may also find simple language indispensable; and

People with manual dexterity impairments may navigate easier with a keyboard rather than with a mouse.

Information has become a social necessity and a fundamental aspect of human rights. No group should be excluded from it. Hence the need to integrate the PWDs into the current information and technological space.

Accessing the Internet- Keyboard and Mouse Issues

As stated earlier, the strongest benefit of ICT is the internet. It is not possible



to access the internet on a system without keyboard and mouse. Nisbet and Poon (1998), pointed out that, many SEN students have difficulty in using the standard keyboard and mouse. Skill (2002) identified the following measures to address this difficulty:

Mouse over Control: Some SEN students find it difficult to move the mouse pointer over a link or even to click the mouse button. A mouse over control command which automatically activates when a mouse is moved over a link can take care of that.

Autoscroll: SEN students who do not have good control over the mouse may find it difficult to scroll down a page. An Autoscroll command can take care of this too. Java script can make a page scroll automatically (see www.wsabstract.com/).

Linklisting: Java script can list all links on a web page and assign a keyboard letter to each, and the keyboard can be used to activate them.

Access utilities software: This can alter the responsiveness of the keyboard, slowing the rate at which a character will repeat when a key is pressed, so that only definite depressions are recognised.

Keyguards: rigid overlays of metal or plastic fitted over the keyboard with holes to allow access to individual keys. This makes it harder to hit the wrong key and therefore enables more accurate typing and

Mouse alternatives: which include: pointing devices, used to provide access to computer for people who cannot use any kind of keyboard; touch screens, fitted to the computer and allow software to be operated by touching the screen and trackerballs or joysticks.

ICT and Social Inclusion of PWDs

Educational standards hold that, students with disabilities should be provided with opportunities to realize their potentials. They should participate in education and training on the same basis as students without disabilities, and that they are not subject to discrimination. ICT have been identified as an important aspect of the wider strategy for the social inclusion of students with disabilities therefore, the following strategies apply:

Distance Education: Distance courses allow students with disabilities to continue living at home while they are studying, to share documents, lessons, exchange ideas and make presentations.

Reading Digital and Audio Libraries: Students with intellectual, hearing or reading disabilities, impaired sight, dyslexia and other disabilities can partake in educational courses via digital and audio libraries, accessing their material, content and resources via the Internet. Such students can connect from home and read or hear the relevant books, without having to go to the university or library.

Internet, Broadband: People with disabilities can use the Internet to builds their capacity to communicate with each other at a distance. Using the Internet will also help them to gather and understand public information and news, to participate in leisure interests with others, to chat, shop, manage their finances, and write to



friends. A computer with a broadband connection provides opportunities for improved participation in everyday life and independent living.

Winning Communication: Persons with disabilities can communicate with others online, taking e-learning courses and interacting with the teacher and fellow students through online discussion forums.

Accessing the Curriculum

Some SEN students may have learning difficulties caused by a physical disability, a problem with their sight, hearing or speech, emotional or behavioural problems, a medical or health problem or difficulties with reading, writing, speaking or numeracy. The use of ICT is essential in enabling them gain access to the curriculum as follows:

For those with physical and sensory disabilities, 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
- prepare work which is specially adapted with large fonts, symbols and particular colours

This will give them some level of independence in partaking in activities and the ability to work in an environment that encourages play and investigation.

For those with learning difficulties, using ICT can:

- provide them with a clutter-free working environment where features of programs are linked to their ability
- enhance the development of activities which are clear, focused and attractive to the learners
- enable them to practice skills in a different context, allowing numerous repetitions in order to aid learning
- support language development activities and offer multi-sensory ways of learning
- offer a medium for differentiated activities

For those with emotional and behavioural difficulties, using ICT can:

- offer them a non-threatening or non-judgmental situation
- allow them to be motivated and offer opportunities for success
- give them the opportunity to be responsible for their own learning
- allow them to work on tasks that are more manageable and achievable

ICT Resources for Education of PWDs

When using ICT with students with physical disability, it is important that there is regular assessment of their needs and the provision of training and support for both the students and their helpers. This will ensure that the equipment offered to them is suitable and appropriate for their needs. ICT resources can include computer access devices such as switches, adapted mice and Keyguards, communication aids and specialized software.



Consideration should be made for students with visual impairment in terms of the position of students in relation to a computer screen, the size of the computer monitor (preferably 17 inches or better), and the clarity of the display. Where possible, colours should be adjusted to meet the specific needs of students. Large and clear fonts and speech feedback should also be used where possible. ICT resources should include talking word processors, screen magnifiers, screen readers, electronic braille and big pointer utilities.

Students with hearing impairment may need symbols and pictures to enhance the meaning of text. Graphics can be used to stimulate writing and illustrated overlays can also make writing more accessible when using a concept keyboard. ICT resources should include symbol generating software, word processors, overlay keyboards, word lists, clipart to illustrate writing, spell checkers and grammar checkers.

For students with emotional and behavioural difficulties, there is a range of ICT resources that can motivate and challenge them. These include multimedia programs and educational games.

For students with learning difficulties, talking books and other CD-ROMs with good sound and graphics which are clearly laid out are useful. Also drill and practice programs, overlay keyboards, word list facilities and talking word processors will support their learning.

Implications

The main aim of this chapter was to discuss the usefulness of ICTs in education of PWDs. The issues discussed are of paramount importance to policy makers, special needs education specialists, students, parents and care givers.

The chapter emphasized the need for development of competencies of teachers, and other specialists involved in education and social rehabilitation of persons with disabilities, policy makers on e-accessibility and ICT usage for persons with various types of impairments. It further creates awareness on the potential of ICTs for social inclusion and reduction of poverty of persons with disabilities among broad educational society, private sector and governments. The chapter stressed spurring larger autonomy and full-scale participation in social life for persons with disabilities through development of e-accessible environment for their communication, learning and access to information. It also promotes computer literacy and vocational skills development among persons with disabilities through application of information technologies and resources.

The chapter highlights how the use of technology in special education helps to break the barriers for people with disabilities and provide them with access to the most relevant educational programs.

Conclusion

It must be stressed that there exists a considerable potential in the educational use of ICTs for PWDs alongside with many challenges and dangers.



New technologies can provide for PWDs the means to explore new forms of learning that break the traditional hierarchies of educational systems and develop genuine alternatives to rigid, passive approaches to learning. However, these technologies could pose some challenges if they are applied without a commitment to the principles of equality, participation, and responsibility.

Suggestions

Based on issues discussed, the following suggestions apply:

It is important to have access points (telecenters) for persons with disabilities especially in remote areas in Nigeria. This will help to maximize the use of information technology (IT) skills for the welfare of disabled students in rural and disadvantaged communities.

Decades of experience have shown that equal education for people with SEN must be supported not only by upgrading ICT infrastructure of special education in compliance with accessibility and usability requirements but by integrating ICTs in SNE curriculum, as well as by quality training and retraining of Special Needs ICT specialists.

The government should ensure that new computerized information and service systems offered to the general public are either initially accessible or adapted to be made accessible to people with disabilities.

ICT should be applied in learning with a commitment to the principles of equality, participation, and responsibility.

Improvement in power supply is necessary to facilitate effective use of the technologies.

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