European Journal of Business and Management
ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online)
Vol.6, No.39, 2014

Information and Communications Technologies in Special Needs Education: Challenges and Prospects

OMEDE ANDREW A.
DEPARTMENT OF EDUCATIONAL PSYCHOLOGY, KOGI STATE COLLEGE OF EDUCATION, PMB 1033, ANKPA, KOGI STATE, NIGERIA
Email: andrewomede@gmail.com

Abstract
Scientific and technological progress of the last few decades has brought not only the economy globalization and worldwide expansion of technologies but changes in social relations, culture, and education as well. Experience has shown that the impact of disability on individuals could be cushioned through the intelligent application of technology. The usefulness of ICT in special needs education manifests in at least four dimensions: instructional, environmental, human resources and the learner technologies. How can ICT help to facilitate effective instruction in special needs education both in special and inclusive classes? 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 gadgets are relevant and suitable for use by special learners to ease their education? These are some of the questions this paper addressed under the sub-headings: special needs children; education of special needs children; ICT in education of special needs children; challenges of ICT in the education of special needs children; and prospects of ICT in education of special needs children. The paper concludes that there exists a considerable potential in the educational uses of ICTs alongside with many challenges and dangers. Useful recommendations were made to maximize the benefits of ICT in special needs education.
Keywords: ICT, Special, education, children.

Introduction

Scientific and technological progress of the last few decades has brought not only the economy globalization and worldwide expansion of technologies but changes in social relations, culture, and education as well. Fast development of telecommunications, media, and information technologies bears huge potential of improving the quality of life. It is particular vital for those, who cannot obtain an appropriate level of education without assistance of educational and technology specialists, i.e. people with special educational needs. Technological advance has unveiled meaningful social opportunities for such citizens by providing a more convenient access to information and communication tools (UNESCO, 2006). The prediction of Marshall McLuhan that the world would become a global village is no longer speculation, but a fulfilment and beyond, even becoming a global household. The compression of the world into a global village is strongly built on the growth and development in information and communication technology (ICT) which has become a vital tool in the education of children with special needs world over. The current period of social development is characterized by the mounting role of information and knowledge which are becoming the main factors of the progress and prosperity of society. The development of Information Society is having a growing impact on every aspect of people's lives. Information technology becomes more and more accessible in daily life. It changes our society bringing a new cultural environment where information is present in every field. Not only the form of working or doing business is altering radically, but the ways of studying, accessing skills and knowledge, and interacting with other people as well.

Children with special needs generally have one form of disability. The term 'special educational needs' covers many kinds of difficulties in learning, and means different things to different people in different places. It 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 (Florian and Hegarty, 2004). These children are unable to learn in ordinary schools as a result of their disabilities or handicaps. Therefore, special needs education is designed to provide additional services, support programmes, specialized placements or environment needed to cater for these unique children in order to minimize the psychological trauma derived from various disabilities.
Considering a wide diversity of individual learners' capacities, it becomes pertinent to find the ways to remove barriers to learning and provide appropriate conditions for equal access to education. ICTs offer a great potential to support lifelong learning for all groups of students, including those who have special

educational needs.

ICT is conceptualised variously by different writers but the concensus as put forward by Idowu and Ajayi (2008) is that they bring to mind: the world of computers, satellites, fax machines, fibre optics, and digital networks and ultimately, the internet. Recent 20 years have brought some remarkable innovations in the delivery of education. Traditional text, sound, graphics, and video are merged into a single 'multimedia' document. The world is getting linked to an increasing extent via computer networks. Digital telecommunication systems are replacing analogue ones. Computer systems, telephones, and television are getting more integrated. Different applications of information and communication technologies have opened up – and will continue to open – more and more possibilities for home-working, Internet banking, e-commerce, e-medicine, and (not in the least) new opportunities in education and training. Experience has shown that the impact of disability on individuals could be cushioned through the intelligent application of technology. The usefulness of ICT in special needs education manifests in at least four dimensions: instructional, environmental, human resources and the learner technologies. How can ICT help to facilitate effective instruction in special needs education both in special and inclusive classes? 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 gadgets are relevant and suitable for use by special learners to ease their education? Such issues are of primary importance for persons with special educational needs – defined most broadly as being caused by differences in gender, age, physical and mental abilities, levels of education, ethnicity, income level, etc.

These questions are what the paper seeks to address under the sub-headings: special needs children; education of special needs children; ICT in education of special needs children; challenges of ICT in the education of special needs children; prospects of ICT in education of special needs children; conclusion and recommendations.

Special Needs Children

Special needs children are exceptional individuals such as the visually impaired, hearing impaired, speech disordered, multiple handicapped, mobility impaired, the gifted and talented, and a host of others who require adaptable curriculum to suit their peculiar learning needs, resulting from their special circumstances (Omede, 2011). Adeniyi (2010) described special needs children as those individuals who because of their peculiarities cannot benefit maximally from services and experience provided for the non-special needs individuals and as such, they need alteration and modification in those services and experience.

These children have some form of disabilities that are capable of frustrating them in benefiting fully from the regular physical education programme meant for those children that are normal. They are found in every community and school system and included those with one or more of the following: learning disabilities, mental retardation, emotional disturbance, auditory impairment, speech impairment, orthopaedic and visual impairments.

The National Policy on Education (2009) classified special needs children into two categories:

A. The physically challenged, who are impaired (physical, sensory), and whom because of this impairment cannot cope with conventional school/class organization and methods without formal special educational training and facilities. They include:
    a. Visually impaired (blind and the partially sighted);
    b. Hearing impaired (deaf and the partially hearing);
    c. Physically and health impaired;
    d. Mentally retarded (educable, trainable, bed ridden);
    e. Emotionally imbalanced (hyperactive, hypoactive/the socially maladjusted/ behaviour disorder);
    f. Speech impaired;
    g. Learning disabled (have psychological/neurological educational phobia or challenges);
    h. Multiple handicapped.
B. The gifted and talented: people (children and adults) with very high intelligent quotient and are naturally endowed with special traits and therefore find themselves insufficiently challenged by the regular school, college/ university programmes.

In spite of the limitations identified with such special needs children, they still possess the ability to acquire education and this will go a long way in making them globally competitive, useful to themselves and the nation.

Education of Special Needs Children

The National Policy on Education (2009) defined special needs education as a formal special educational training given to people (children and adults) with special needs. Educating persons with special needs could take place either in a special school setting or in an inclusive class.

Children with special needs are said to be educated in a special or segregated school setting where students with disabilities receive classroom instructions separately from students without disability. On the other hand, inclusive education presupposes that children with special needs receive educational instruction alongside non-disabled children in the same classroom with necessary modifications to accommodate the peculiar needs of the special children (Florian and Hegarty, 2004).

The mode of education notwithstanding, education of special needs children is traditionally equipment driven. As such, technology is not new to special needs education, rather, the discourse places emphasis on the information and communication technology devices relevant to special needs education, and the shift from the now obsolete devices to the latest useful hi-tech devices and the extent of their usefulness, limitations encountered by special children in their use and how to address same in order to maximise the potentials of ICT for optimum special needs education.

ICT in Education of Special Needs Children

The prosperity of the emerging society is determined, to a large extent, by its
ability to engage ICTs in education (UNESCO, 2006). ICT comprises of pieces of equipment, networked infrastructure and the associated knowledge and the skills for creating, manipulating, transferring and using information or knowledge. In the area of electronics and technology, special needs education is known for use of heavy duty as well as portable technology in teaching children with special needs. These devices commonly referred to as Assistive Technology (AT) range from the more general, such as radio, television, tape recorder, overhead projector, computer, computer games, enchanted learning CDs, books on tape to the specialised ones such as ultrasound canes, scanners, voice synthesizers, hearing aids, embossed Braille computers, lens optician and the internet. Being a wide field, AT includes very simple and well-known products, such as white canes for blind people or manual wheelchairs as well as sophisticated high-tech products, i.e. computers and powered wheelchairs with voice control.

In education, the technology supporting and helping students with disabilities increasingly implies computer-related applications. Information and communication technologies have expanded the AT field to new dimensions, opening new doors, broadening horizons and enabling autonomy for many individuals with special needs.These devices are relevant to special needs children in terms of existence, communication, body support, travel and mobility, environment adaptation, learning, sports and leisure. In other words, they play invaluable roles in qualitative special needs education.

To prevent social exclusion we must clearly understand the role of ICTs in education for people with special needs. 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 (by definition) additional demands (often referred to as special educational needs) caused by functional limitations which affect learners' ability to access standard educational methods of instruction, therefore, prevent educational progress (UNESCO, 2006).

In this context, ICT application is very important as it plays an essential role in providing high quality education for students with disabilities. ICTs have been introduced into the teaching-learning process in order to improve 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 need 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. However, 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, persons with special needs 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 Information and Communications Technology in the Education of Special Needs Children

Speedy development of Information Age brings possibilities and dangers to people with special needs. Whilst 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 disabled, 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 assistive technology for the education of children with special needs. According to UNESCO (1994) persons with disabilities 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:

1. High cost of equipment and gadgets that would enhance effective and independent functioning.
2. 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.
3. 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 e such repairs. At other times, the model of such machines might have been obsolete as well (Ajobiewe, 2009).
4. 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.
5. 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 had not experienced ICT throughout their learning tend to have a negative attitude towards it, as they may lack the training in that area of the curriculum.

ICT benefits for students:

Over the last few years, the computer has turned into a valuable resource for teaching students with an ample 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. Using high-tech AT devices in educational activities allows students with Special Educational Needs (SEN) to be indispensable in the group of their peers, to participate in the learning process as protagonists, and to gain self confidence, social and communication skills (UNESCO, 2006). The AT applied in education enable students with disabilities to exploit their cognitive potential, to interact with others, and to control certain aspects of their environment. AT gives the opportunities to access the curriculum at the adequate level, providing facilities as well as incentives for learning. Using the right AT device, suitable software, and appropriate educational methodology, children who can't hold a pencil can nevertheless draw and write, for example. Similarly, children unable to speak can use the computer as a communication tool.

According to the research of British Educational Communications and Technology Agency (BECTA, 2003), ICT usage in schools to support children with SEN can enable learners to communicate, participate in lessons, and learn more effectively. ICT

- Enables 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 (ACE Centre Advisory Trust, 1999);
- Visually impaired students using the internet can access information alongside their sighted peers (Waddell, 2000);

- Students using voice communication aids gain confidence and social credibility at school and in their communities (Worth, 2001);
- Increased ICT confidence amongst students motivates them to use the Internet at home for schoolwork and leisure interests (Waddell, 2000).

For teachers and non-teaching staff of special needs education, the use of ICT;

- Reduces isolation for teachers working in special educational needs by enabling them to communicate electronically with colleagues (Abbott and Cribb, 2001; Lewis and Ogilvie, 2002);
- Supports reflection on professional practice via online communication (Perceval-Price, 2002);
- Enhances professional development and the effectiveness of the use of ICTs with students through collaboration with peers (Lewis and Ogilvie, 2002);
- Materials already in electronic form (for example, from the Internet) are more easily adapted into accessible resources such as large print or Braille (Waddell, 2000).

ICT benefits for 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 (Worth, 2001).
- 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 special needs children

In spite of the challenges encountered in the application of ICT in the education of special needs children, there are remarkable impacts on education. There is a growing awareness that people with disabilities have the right to expect the same standard of service and access as every other member of the society. However, disabled people must overcome additional obstacles before they enjoy the information, services, entertainment, and social interaction offered by the ICTs to the full: 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, and we cannot allow any group to be excluded from it. Therefore, we have to find ways to integrate these people into the current information and technological space. We have just started to explore and put into practice the potential of ICTs to support independent living and learning by persons with special needs. This potential exploited can lead to very important consequences for the equality of life of the disabled. In this connection, understanding of the barriers to learning faced by those who have SEN, is imperative if we aim to improve accessibility.

Conclusion

It must be stressed that there exists a considerable potential in the educational uses of ICTs alongside with many challenges and dangers. New technologies can provide 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 of people with special educational needs. However, these technologies can turn up as obstacles to education if they are applied without a commitment to the principles of equality, participation, and responsibility.

Recommendations

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.

Finally, implementation of the policy must be monitored to decide whether it provides the support required to achieve its goals, to analyze and interpret its results in improving general benefits from SNE policy.

References

Abbott, C. and Cribb, A. (2001). Special schools, inclusion and the World Wide Web: the emerging research agenda. British Journal of Educational Technology (BJET), 32 (3), pp. 331-342.

ACE Centre Advisory Trust (1999). Catchnet: The use of telecommunications technology to provide remote support and training to young people with access difficulties. ACE Centre Advisory Trust. Retrieved from http://www.acecentre.org.uk/download/catchreport.doc on 11/11/2013.

Adeniyi, S. O. (2010). Counselling parents and people with special needs: The beginning of building inclusive society in Nigeria. In T. Ajobiewe and P. I. Osuorji (eds), New Perspectives In Special Needs Education And Sustainable Development. National Centre for Exceptional Children.

Ajobiewe, A. I. (2009). Information and communication technology for social inclusion of persons with visual impairment. The Exceptional Child, 11(2), 442-448.

BECTA ICT Research (2003). Retrieved from http://www.becta.org.uk/page_documents/research/wtrs_ictsupport.pdf on 28/04/2014.

Federal Republic of Nigeria (2009). National Policy on Education. Lagos: NERDC Press.

Florian, L. and Hegarty, J. (2004). ICT and special educational needs: A tool for inclusion. Buckingham: Open University Press.

Idowu, P. A. and Ajayi, A. S. (2008). GSM based referral system for primary health care centre in Nigeria. International Journal of Soft Computing, 3(6), 421-427.

Lewis, A. and Ogilvie, M. (2002). The impact on users of the national grid for learning SENCO-forum email list. University of Birmingham. Retrieved from http://www.becta.org.uk/page_documents/teaching/sencoforum1.Pdf on 13/05/2014.

Omede, A.A. (2011). Reforms in special education for optimum educational attainment by persons with special needs for national sustainability. Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS), 2(4), 296-300.

Perceval-Price, N. (2002). SLD network for special school teachers. Annual Conference of the Educational Research Network of Northern Ireland (ERNNI), October 2001. Retrieved from http://www.tutorlive.net/imscet/executivesummaries/norma_executive_summary6.doc on 11/11/2013.

UNESCO (2006). ICTs in education for people with special needs. Moscow**:** Institute for Information Technologies In Education Specialized Training Course.

UNESCO (1994). The Salamanca Statement and Framework for Action on Special Needs education. World Conference on Special Needs Education: Access and Quality. Salamanca, Spain, 7-10 June 1994. United Nations, Spain. Retrieved from http://www.unesco.org/education/pdf/SALAMA_E.pdf on 28/04/2014.

Waddell, L. (2000). The pilot internet project: evaluation report. London: Royal National Institute for the Blind.

Worth, N. (2001). Fountaindale communication project. International Journal of Language and Communication Disorders, 36, 240-245.

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:
http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/ All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

Academic conference: http://www.iiste.org/conference/upcoming-conferences-call-for-paper/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar