

## ENHANCING EDUCATION OF CHILDREN WITH VISUAL IMPAIRMENT USING (ICT)



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### ABSTRACT

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*In recent years there has been a grounds well of interest to how computers and the internet can best harnessed to improve the efficiency and effectiveness of education at all levels, to all categories of learners and in both formal and non-formal settings. But ICT are more than just these technologies. Therefore, the paper attempts to define the terms information and communication technology (ICT) education and children with visual impairment. It also discusses the goals of information technology in Special Education as well as Braille and information technology. It also discuss the relevance of information and communication technology on children with visual impairment as well as the information and communication technologies for meeting the educational needs of children with visual impairment. Finally, conclusion is drawn; all are to meet unique needs of children with visual impairment intellectually.*

**Keywords:** *visual impairment, Information and Communication Technologies (ICT), Educational Needs.*

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### Introduction

Information and Communication Technology (ICT) is becoming increasingly important in our daily lives as well as in educational systems. Therefore, there is a growing demand on educational institutions to use ICT to teach the skills and knowledge that students need for the achievement of their educational needs. Modum (2001) added that the constant evolution of the environment denotes a need for the educational system to keep in tune with changes brought by ICT. There is imperative need for educators and learners to adapt to these changes.

Information and Communication Technology is proving opportunities for the use of computer aided learning (CAL) system to assist in the education and training

of pupils and students. The ever increasing dependency of education upon the computer seems inevitable, because it helps meet the needs of the students for greater individualization of instruction and greater relevance of subject matter and a growing expectation in society and efficiency in schools (Modum, 2001).

National Policy on Education (NPE 2004) also states that one of the objectives of special need education is to give concrete meaning to the idea of equalizing educational opportunities for all children, their physical sensory, mental, psychological or emotional disabilities notwithstanding in view of this policy, information and communication technology is for all children irrespective of their conditions.

In the light of the above reasons, this paper aims to discuss about the contributions of information and communication technology in meeting the educational needs of children with visual impairment.

### **The Concept of Information and Communication Technology**

Information and communication technology is a combination of concepts like computers, telecommunication, electronic mail (e-mail) etc. Introduced to suit our managerial and organizational needs and to serves as requirement for educational and information control and developments. Information and communication technology covers computers, electronics etc. used for transactions, provision of information, acquisition of information, data management and effective decision making. Information and communication technology therefore, can be said to be the infrastructure of the knowledge development. Mukhtar (2001) defined information and communication technology as a broad-based technology (including its methods, management and applications) that supports the creation, storage, manipulation and communication of information. Mohammed (2004) also sees information and communication technology as a range of products and systems which handles, process and produce information using computers and or telecommunication technologies.

### **The Concept of Children with Visual Impairment**

Ozaji (2005) states that children with visual impairment are children in whom the sense of vision is defective and this could range from ability to see a little to total blindness. These children are visually impaired when they cannot perform visual tasks (e.g. print reading). They are visually handicapped when they encounter difficulties that prevent them from total integration into the society. For the teacher, a person is blind if he cannot read ordinary/bold print. It means such a person must read through Braille.

Furthermore, Okeke (2001) opined that a child with visual impairment includes: the visually impaired, (the blind, the low vision and the partially sighted), the short sighted and those who suffer from astigmatism (an eye defect resulting to blurred vision). The term visually impaired is often referred to a child with some

amount of visual problems which could be remedied either by surgical operation or optical correction. In addition, the visually impaired are those categories of children who cannot see after all corrective measures have been applied. Hence, these children use the Braille system of reading and writing as their means of communication.

### **Goals of Information and Communication Technology in Special Education**

Ozaji, (2003) wrote extensively on the goals of information and communication technology in Special education. The major goals of ICT in Special education is to achieve adequate education for all special cases (National Policy on Education, 2004). This goal is broad. Element of the goal should include access to diverse curriculum, to live useful independence live, to enjoy social live, to enjoy parity with others in information technology usage, to equalize opportunity with others, and to become technologically literate. The child should be freed by technology in order to be what he wants to be, to go where he wants to go and actualize his potentials. This is what “adequate education” stands for.

### **Braille and Information Technology**

Kassim (2004) stated that the development of information technology especially the internet has for many years increased the accessibility of information. For people with visual impairment, correspondence through e-mail is an equal way to communicate. Today personal computer and Braille displays slowing in Braille the information on the computer screen line per line through the use of software, give the Braille users a better control over reading and writing than ever before. Braille cell with eight dots are commonly used on Braille display, while Braille cell with six dots are used mainly for writing or printing Braille on paper.

### **The Effects of ICT on Children with Visual Impairment**

Ozaji (2003) stated that the impact of ICT could be felt in all spheres of human endeavor. This could be felt in the spheres of the transportation, agriculture, automations or educational growth. ICT helps in making and doing things in a more efficient and practical manner. Another effect of ICT is that it aids educational growth. In the olden days the person with visual impairment were discriminated against in education. There was no means of reading. Nowadays there are libraries for the visually impaired and sighted persons.

There are many organizations both within and outside the country that transcribe books into Braille for the persons with visual impairment to read. Hence, with advent of computer, lots of printed books are being put into Braille. In Nigeria, the Anglo-Nigeria Welfare Association for the Blind, (ANWAB), Niger wives, Hope for Blind, Federal College of Education (Special), Oyo, provide reading materials for visually impaired, while in overseas countries there are Royal Common Wealth for

the Blind (RNCWIB) in London and Braille Perkins School for the blind in America that helped the persons with visual impairment tremendously in their academics.

### **Categories of ICT for Meeting Educational Needs of Children with Visual Impairment**

The ICTs for meeting educational needs of people with visual impairment are very numerous. Some of these devices, according to Gabriel (2013) include:

1) **Duxbury Braille Software**

Duxbury Braille Software Translator (DBT), it translates print to Braille and Braille to print. DBT can translate into either grade 1 (uncontracted) or grade 2 (contracted) literary Braille for many languages, and also into several different codes for mathematics and other technical notations. It can also translate from Braille into the equivalent print for several languages and Braille codes. The DBT also provides for formatting of Braille documents, along with translation of text. This generally implies reworking the format to certain extent, as Braille format is not always similar to print format.

2) **Window Eyes Software**

The window eyes software screen reader is just software that reads the computer screen out aloud. This allows blind and visually impaired computer user to hear what is happening on their computers, or read it through special refreshable displays. This allows them to use standard window software, like Microsoft office, internet explorer, E-mail programs, and even specialized industry or corporate software.

3) **The Grid Software**

The Grid Software enables people with physical and sensory disabilities to communicate and access a computer without a key board and mouse. Your computer can be used for voice output communication and other computer software.

4) **Braille Sense On hand**

The Braille Sense On hand is a Braille note tyker developed and manufactured by HIMS, for people who are blind and visually impaired. The Braille Sense Onhand has a variety of powerful capacities including the following:

- Use the word processor and the Perkins style key board to create Braille document.
- Print your text documents using any compatible Bluetooth or USB ink printer.
- Open Microsoft document and read them in contracted Braille.
- Create hard copy Braille documents by connecting the unit to a Braille embosser etc.

5) **The Smart Perkins Brailier**

The Smart Perkins Brailier is a manual Braille device. It can be used to create Braille documents even if there is no electricity available. The Smart Perkins Brailier used the six key entry methods for Braille input. The Smart Perkins Brailier takes one

step further by allowing individual to see and hear what letters is being Brailled. It also allows non-braille reading teachers to assess the progress and success of their students by following along in print.

Abang (1995) also identified some information communication technologies for meeting educational needs of people with visual impairment as follows:

l) **The Optacon**

It is a reading device for the blind; it is from optical to tactile connection. The user holds a small camera in one hand to read printed materials and convert them to impulses. With the index fingers of his other hand, the user can feel the impulses and the number through a one inch-tactile array of 144 small vibrating rods contained in a portable cassette tape recorder. As the camera moves across the letter, the user feels two vertical lines and one horizontal line moving beneath his fingers. In this way, he can identify the letter and combine them to form words.

a) **Kurzweil Reading Machine**

The machine utilizes computer technology to translate print into synthetic speech output.

b) **Versa – Braille**

This is a self-contained Braille and audio information system. It has 20 – cell electronic tactile displays. There are sophisticated micro-computer in the device to record automatically information spare separate chapter and page for simple logical and organization of materials. The user can without difficulty locate any page. It can record and play back as multiple tract audio.

c) **View Scan**

This is a reading system which is very portable. It accepts print by means of a small camera which must be kept in contact with printed page and tracked along the line of print, (Kassim, 2004).

d) **Another ICT device for visually impaired is micro-writer:** This is a mini-work processor which has a variety of functions when used in conjunction with TV, monitor speech synthesizer and printer. It is small enough to be hand-held and has six keys which fit well into the span of the finger. Various combinations of the keys from a codes of letters and work processing instructions, (Kassim, 2004).

e) **The Tele – Touch**

This device is generally used by deaf-blind (multiply handicapped). It has only one Braille cell in which six pins are move upwards and downwards. The deaf-blind person paces one finger on the cell, the person communicating types the message on the typewriter key board which is similar to that of regular typewriter key board. The appropriate pins in the cells move up and down to convey words to the deaf-blind person.

f) **Speech Compressor**

This is a device which makes it possible for the user to control the speech of the audio output of a tape to produce compressed processed speech. The material is

then recorded in its shortened form. Other ICTs for visually impaired people's education include: Talking calculator, Perkins braille, Paperless Braille machines, Braille thermoform machine, Braille dymotape machine etc.

### **Conclusion**

Teaching visually impaired people requires specialized trained teachers and personnel, special materials, facilities, equipment, information and communication technologies. The modern information and communication technologies for meeting educational needs of people with visual impairment discussed in this paper are: Duxbury Braille software, Window eyes software, Grid software, Braille sense on hand, smart Perkins Brailler etc. Although these devices are exorbitant and are not locally available. Consequently, making this software available will help alleviate lots of challenges visually impaired persons face in their Education.

### **Recommendation:**

- 1- The students with special needs should not be exempted from using ICT instruments
- 2- Government should make ICT available in all schools including special schools for the benefits all students.
- 3- More training on ICT should be given to teachers of students with special needs
- 4- Government in its capacity should organize a public awareness programme about ICT for students and teachers of special needs
- 5- Teachers and students should take ICT very important because it makes everything easy in the globe.

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