

**The Art, Science and Technology of  
Assessment of Persons  
With Learning Disabilities in the 21<sup>st</sup> Century.**

By

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**ABSTRACT**

The phenomenon of assessment concerns all members of community of practitioners of education. Their predominant concern is accommodation of students with special needs, cultural issues and creating alternative practice that have equivalence to standard activities. This paper took a cursory look at the various ways through which assessment of candidates with learning disabilities is enhanced using ultra-modern scientific devices with a view to creating assessment equity between the disabled and normal candidates in a typical learning environment. The paper gave a definition of learning disabilities and description of who the learning disabled are. The art, science and technology of assessment were also defined and some of the devices were discussed on the basis of how they will enhance the education and assessment of the learning disabled. The challenges inhibiting the use of these devices were highlighted upon which recommendations and conclusions were made.

**Keywords:** Science, Technology, Assessment and Learning Disabilities.

## INTRODUCTION

A typical classroom setting is stratified as it consists of individuals of different intellectual and academic capacities. Some students are exceptionally gifted, talented, average or weak in performance of certain tasks in the classroom. Other category of students have a form of disorder in one or more basic processes involved in understanding of concepts learnt in the classroom or in using spoken language. These disorders are manifested in a variety of ways including listening, thinking, reading, talking/speech writing, spelling or in basic and spatial arithmetic calculation or computational weakness.

On the basis of the above background, the challenge facing the teacher is to design appropriate methods and devices to assess these individuals with these disorders so that a level playing ground can be attained. Such individuals should be seen to be fairly and justly assessed so that he/she would not be disadvantaged compared to other “normal” students in the classroom.

The potential and adaptability of information and communication technology (ICT) in human endeavours and tools for assessment in education has been established and demonstrated.

Aniefiok (2008), opined that ICT has recently become very popular in many fields of human endeavours including the educational arena. He further explained that computers are used in schools for various tasks but the general use of computer in any educational programme is to promote learning.

Onuigbo(2008), stated that the influx of computer-based technology has immensely affected the area of teaching and learning as there is a paradigm shift from teacher-based instruction to student-centred electronic learning, which involves interactive approach. In the field of special needs education in general and learning disabilities in particular, it has been proven that information and communication Technology (ICT) is very effective in identification, assessment and as an intervention strategy for persons with learning disabilities.

### **Concepts of Learning disabilities (LD) and Learning Disabled Persons.**

According to Nwokolo (2007), the term “Learning Disabilities” (LD), was first used by Samuel Kirk in 1963 to describe children who have serious learning problems in schools, but no other obvious “handicap”. In contemporary world of today, learning disabilities is widely recognised as special conditions that have connection with human ability to learn through psychological process coordinated by the brain.

Lere (2007), posited that learning disabilities are internal problems and that children with these disabilities have difficulties in understanding or using language (spoken or written), imperfect ability to listen, think, speak, read, write, spell or do mathematical calculation. The term also includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia and dysphasia.

From the foregoing, therefore, LD is a generic term that refers to a manifestly group of disorders symptomized by significant difficulties in acquisition and application of skills in speech, reading, writing, arithmetic, reasoning and logic. In isolated cases, LD may be expressed as memory and concentration problems, impulsiveness, attention deficit, hyperactivity and poor social and interpersonal relations.

Therefore, the term LD is used to refer to any retardation disorder or delayed maturation of the learner in one or more of the processes of speech, language, reading,

writing, computational competencies or other school subjects caused by cerebral dysfunction, emotional or behavioural maladjustments.

The individuals that are learning disabled according to Okeke (2001), are therefore, those children who have one or more deficits that are not caused by learning, visual or emotional disturbance which hinder proper development and as a consequence prevent them from achieving maximally like other children of approximately the same age, grade and intelligence quotient. The learning disabled persons, therefore, have problems of talking and processing Information accurately.

In summary, the learning disabled person may not have a pronounced physical disability yet he or she cannot perform or achieve academically, socially or emotionally. The learning disabled person shows a highly significant level of difference between his estimated potentiality in intellectual attainment and actual level of educational performance.

### **Dimensions of Learning Disabilities**

The description of a learning disabled person given above could be symptomatic of any of the following conditions listed below:-

- Dyslexia: A language and spelling disorder.
- Dyscalculia: A mathematics or computational disability.
- Dysgraphia: A writing disorder resulting in poor handwriting and illegibility.
- Dysphasia: A motor coordination disorder.
- Non-Verbal Learning Disorder: Having difficulty in understanding non-verbal cues e.g. body language.
- Visual Perception Disability: inability to distinguish difference in shape (graphemes). Then might rotate or reverse letters or numbers e.g. 6,9,d,p,q,b.

### **Assistive Technology and Assessment of Persons with Learning Disabilities.**

#### **Assistive Technology.**

Assistive technology devices enable a learning disabled person to live independent lives and develop to their maximum capacities both academically and socially. Assistive technology offers person with LD the tools necessary to be more successful in school, at works and at achieving air of freedom in daily living. Assistive technology is essentially Information, Communication and Technology devices to improve the functionality, capability and achievement of a learning disabled person.

According to Curry (2003), assistive technology refers to “any item, piece of equipment, or product system whether acquired commercially off the shelf modified or customized, that is used to increase, maintain or improve the functional capabilities of a child with disability”.

## **Assessment of Persons with Learning Disabilities using Assistive Technology**

ICT is a concept that has become globally appreciated. It is generally regarded as the fourth industrial revolution in the world. It has become the gateway to the modern information and communication super-highways, skills and orientation which distinguishes the world order.

Assistive Technology in education can be understood as the application of digital apparatus to all aspects of teaching, learning and assessment. It is the combination of technologies for collecting, storing, processing, communicating and delivery of information related to teaching and learning process.

Obanya (2002), posits that the spread and efficiency of ICT is critical to the achievement of educational goals.

Some of these assistive technology tools used for assessment of learning disabled persons include but not limited to the following:-

- The keyboard
- Text Reading systems (Text to Voice)
- Speech Recognition System
- Tape Records
- Reading Pen
- Talking Calculators.
- Electronic Math worksheet.
- Colour Highlighters
- Word Prediction
- Spell checkers.

### **The Keyboard**

This may be the best assistive tool for a learned disabled person who had difficulty with the needed coordination for good and legible handwork (dysgraphia) with pen or pencil. Taiwo (2008), was of the opinion that students who find handwriting difficult or impossible, the use of keyboard might enable them to record their work easily.

### **Text Reading System (Text to Voice)**

This technology allows text on screen to be read aloud through a computer's sound card. Hard copy text is scanned and converted to text file that can be read by software with Optical Character Recognition (OCR). The computer then read the words aloud using a speech synthesizer.

### **Speech Recognition System**

This is a device that enables the user to dictate the computer through a microphone converting oral language to written text. The speech recognition systems are helpful to persons whose oral language proficiency is better than their written ability.

### **Tape Recorders**

A learning disabled person with difficulty in reading can listen to recorded texts like books, journal, newspapers etc. rather than reading them. This technology can be used to capture and record spoken words such as teacher's instruction or classroom lectures. Variable speech

control (VSC). Tape recorders enable the listener to play audio-taped texts faster or slower than it was originally recorded without losing its quality.

### Reading Pen

The technology of a pocket-sized “reading pen” uses an optical scanning system to allow a student scan single word on a hardcopy page and have the word read aloud with the aid of an in-built speech synthesizer. The pen is useful for spelling, word definition and reading texts.

### Talking calculators.

Calculators are electronic devices used to solve mathematical, arithmetic or computational problems. By the use of keys, mathematical operations are effortlessly carried out with accuracy. Talking calculators use built-in synthesizer to call aloud numbers, symbols and operation keys as they are pressed. They also read answers from calculation.

### Electronic Math Worksheet

This technology can assist a person to organise, align and solve basic mathematic problems on a computer screen. Mathematical operations like addition, subtraction, multiplication and division are entered via the keyboard or mouse and made to align to the correct vertical format.

Nwabueze(2008), opines that the programme can assist persons who have difficulty in organising and aligning mathematical problems with pen and paper.

### Colour Highlighters

This technology assists persons with reading difficulties to distinguish words that are homonyms, homophones or homographs. These are words that share spelling and pronunciation but may have different meanings. e.g. death, dearth, depth. This device enable the learning disabled person to highlight difficult words or sentences in different colours and make the reader to visually differentiate these words.

### Word Prediction

This programme work together with word processors. Dubblels (2004), stated that the programme predict the word a person intends to enter into the computer with the aid of a keyboard. The person types the first letter of a word and the programme offers a variety of words that begin with that letter. If the intended word appears on the list, it is then chosen, clicked and incorporated into the sentence. If otherwise, the person continue to type the next letter until the intended word appears.

### Spell Checkers

A list of correctly spelt words will appear on the computer screen when the user clicks the right word. Spell and grammar checker is a feature in the built-in word processor. Others offer a complete dictionary, yet some devices pronounce the words with a speech synthesizer, so the words can be heard as well as seen on the computer screen.

### **The challenges of using Assistive Technology in Assessment of persons with learning disabilities.**

Despite the awareness of existence of assistive technology devices in assessment of persons with learning disabilities, its usage is faced with some challenges which include but not limited to the following:-

- They are expensive and costly to acquire and maintain.
- Most of the teachers are not proficient in the use of these devices, others have poor knowledge of the technology that is suitable and adaptable for the learning disabled students.
- Poor power supply to operate such devices. Most schools that are located in rural areas may not have a ready source of power. In other places, which are connected to the national grid, electricity supply is epileptic.
- Assistive technology for assessment of persons with learning disabilities has not be fully integrated and appreciated in the education curriculum of most countries of the world.

## **RECOMMENDATIONS**

Based on the foregoing, the following recommendations are made:-

- The federal, State and Local governments, Non-Governmental organisations and public-spirited individuals should assist by purchasing these assistive technology devices and distribute same to schools for the benefit of learning disabled persons.
- Capacity-building workshops, seminar and conferences should be organised for teachers and persons with learning disabilities to expand their horizons and skills.
- The use of generating sets, solar powered electricity and inverter devices should be purchased to power these devices.

## **CONCLUSION**

For a successful assessment of persons with learning disabilities in this 21<sup>st</sup> century, effective and maximal mobilization and utilization of assistive technology cannot be overemphasized. The use of these assistive technologies will revolutionized the process of assessment of persons with learning disability if employed in the course of teaching and learning.

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