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## **CORRELATION BETWEEN KNOWLEDGE OF COMPUTER SCREEN READER AND RESEARCH SKILLS OF PUBLIC UNIVERSITY STUDENTS WITH VISUAL IMPAIRMENT IN SIX GEO-POLITICAL SOUTH-SOUTH ZONES OF NIGERIA.**

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### **Abstract**

This paper explored into correlation between knowledge of computer screen reader and research skills among public university students with visual impairment in six Geo-political South-South zones of Nigeria. One hypothesis was formulated. Correlational survey design with the application of complete enumeration survey approach to collect all the sample size of thirty-four respondents from the thirteen public universities of the six south-south states. They included Cross-River, Akwa-Ibom, Rivers, Bayelsa, Delta and Edo. Data was analyzed through a researcher-developed instrument titled "Screen Reader Research Skills Questionnaire (SRRSQ). This design was applied for the reason that the independent and dependent variables associate together. Cronbach Alpha was used to obtain the reliability and the coefficient yielded 0.947. Data gathered was through questionnaire administration and analyzed with SPSS using reliability. The result showed that 'knowledge of computer screen reader significantly correlates with research skills among public university students with visual impairment in six Geo-political South-South zones of Nigeria'. Based on the result and conclusion, the recommendations among others presented was organization of comprehensive training of each student with visual impairment for acquisition of knowledge in computer screen reader through workshops, conferences and seminars

**Key-words:** knowledge, Computer screen reader, Research skills, Students with visual impairment and Pubic University.

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### **Introduction**

The eyes are important means of obtaining information from any environment. Humans in all (students who have visual impairment inclusive) as stated by Amabile (2012) possess - certain level of skills. Impairment is inability to function properly as a consequence of defective functioning and structural development of any part of the body structure which are different organs in the body system. They include; eyes, ears, nose, brain, throat and so on. Visual impairment is a unique condition that presents significant challenges to university students' academic pursuits, particularly in this digital era. This 'vision impairment' as a term used by professionals in the field of Special Needs Education (SNE) refers to 'Students with Visual Impairment (SVI) as having limitations in some

number of visual problems that deviated from normal'. Visual impairment is a situation where students in public universities suffer bad vision and categorized into three namely; Blindness, Low-vision and Partial sightedness. According to Eniola (2010), blindness can be grouped into three which are medical, legal and educational. Medical and legal blindness are perceived as severe loss of central visual acuity of more than 20/200 or less in the better eye with contact lenses as the best form of correction. But educational blindness the author continued occurs when the eyes of the students are not able to process images/or see anything, cannot read nor write even with the most powerful corrective optical aids. Secondly, low-vision involves combination of vision and other senses to learn. They included the mouth, nose, ear and hand.



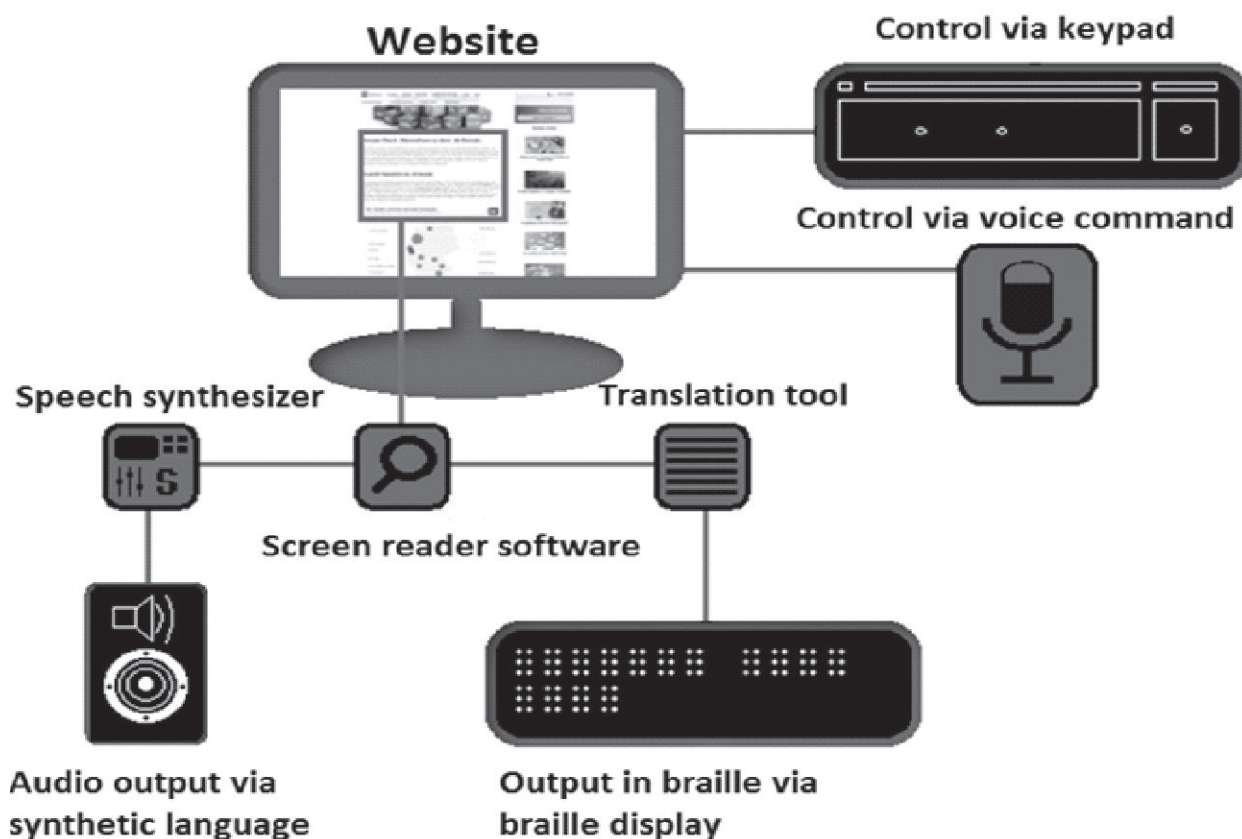
Partial-sightedness means some difficulties seeing and reading print information that require assistive device (Eniola, 2010). Another definition presented partial-sightedness as refractive errors of short-sightedness (myopia), long-sightedness (hypermetropia) and astigmatism (eye not perfectly smooth or rounded). In summary, visual disability injures this special organ of eyes so much and thus badly disrupts the educational performances of individual student in who are visually impaired in public university if learning is made conducive with suitable assistive technology. This impairment that affects learning resulted in introduction of special methods and tactile materials such as Braille. Computers and other technologies are strong tools that support independent student to communicate with online media and has been considered a better option in lecturing and studying.

A computer is a programmable machine designed to perform calculations, work advanced arithmetic and have logical procedures when sending the input by the user which thereafter produced the desired output processing. The computer is a numerical device. Nowadays, the beauty of the computer is in its speed, accuracy and simplicity of tasks. Computer screen reader is the most commonly used Assistive Technology (AT) for academic research (See figure 1. It is one of the best AT devices for students with visual impairment in public universities in order to develop research skills. As the name suggests, screen readers relay the screen content to the user. This software application converts text on the computer screen to audible speech. This

means the students will be able to read every information on the screen such as dialog boxes, text, prompt including web pages, menus and other computer visuals. Nearly all screen readers have in-built software's and commonly used ones are JAWS - Job Access with Speech, NVDA- Non-Visual Desk Access, Supernova, Window-Eyes narrator, Voice Over, talkback and so on (Kayte, Mundada & Kayte, 2015).

The computer with screen reader is “the highest equalizer” as stated by Mamfha, Ngubane, Dube and Ngubane (2023) because it permits equal access to information, empowers students with visual impairment to read digital documents and bring about independence just like a sighted student. The screen readers' knowledge was examined by Afolabi and Akinyemi (2018) among students who are visually impaired in Nigerian public universities. The study found that only 54% of the students have knowledge of screen readers. Notable challenges faced because of knowledge of the equipment were limited access to digital contents, inability to use educational tools and software's, great reliance on others for with digital tasks, slower task completion, technical difficulties, limited participation in collaborative and online learning environments, and a host of others.

In another instance, Adejuwon and Olatunde (2016) investigated on knowledge of computer screen reader by students with visual impairment in Nigerian public universities. The findings of the study showed that only 50% of the students had knowledge of screen readers, as shown below;



A research carried out by Oyewole and Afolabi (2014) was on the knowledge of computer screen readers by blind and students who are visually impaired in Nigerian public universities. The major findings of the study were that 40% of the students had knowledge of screen readers. Setbacks encountered were a result of screen reader knowledge barrier by the students which included lack of technical support, inability to engage in on-line discussions, access e-books and the difficulty of learning how to use them. Research skills are crucial for public university students who are visually impaired for effective, proper creative and ethical ways (Maddens, Depaepe, Janssen, Raes & Elen, 2021). The skills can be mastered as discovered by Mutumburanzou (2018) through teaching and regular practice.

Developing research skills will be difficult to have when the students with visual impairment do not have knowledge of specialized computer screen reader expected in e-learning academic institutions of today. These research skills are essential for the students' academic pursuits (increase chances of accomplishments in their area of specialization), professional

development and personal growth. Such skills have become a prerequisite for academically skilled internet students. The main goal of undergraduate research is to assist students with visual impairment in public universities think critically and develop independent research skills for successful online investigation using screen reader. Those skills are listed as; problem formulation, literature review, design of the investigation, sample selection, instrument design, and many more. Therefore, public university education is highly demanding and incomplete without knowledge of the screen reader to facilitate the development of research skills.

By definition, research skills are the abilities to find, collect, organize and evaluate information from a variety of sources (taking research classes, reading research papers and to see how other researchers have conducted their research). The skills as explained by Ajayi (2018) is the capability of students who are visually impaired to individually operate computer screen reader to collect, organize, and analyze data to solve the hypothesis formulated then interpret research findings effectively to different audience. Also,



the investigator defined research skills as knowledge that the students derived from screen reader in locating information, working with evidence and releasing reliable results during the research process. Clearly, computer screen reader knowledge is a necessity for students with visual impairment in public universities who have more tasks such as research to carry out. This study aims to determine the correlation between university student's knowledge of computer screen reader and their research skills in the six geo-political areas, Nigeria.

### **Statement of the problem**

Internet and technological knowledge are important for each university students with visual impairment. But, from the researcher's communication with most public universities students who have visual impairment, it showed that they do not independently possess essential aspects of research skills to be viewed as digital citizens. They lack thorough and updated knowledge of computer screen reader and do not follow the trend of it. In this existing 4.0 age, information read in form of only text and images cause setbacks to each student who is visually impaired in public universities. Therefore, they cannot read online learning materials like e-books, e-journals, paper articles, newspapers, and a host of others for their school project write-ups, assignments, test, examination and conference papers.

### **Purpose of the study**

The main purpose of this study was to investigate the knowledge of computer screen reader and research skills of public university students with visual impairment in six geo-political South-South zones of Nigeria.

### **Research hypothesis**

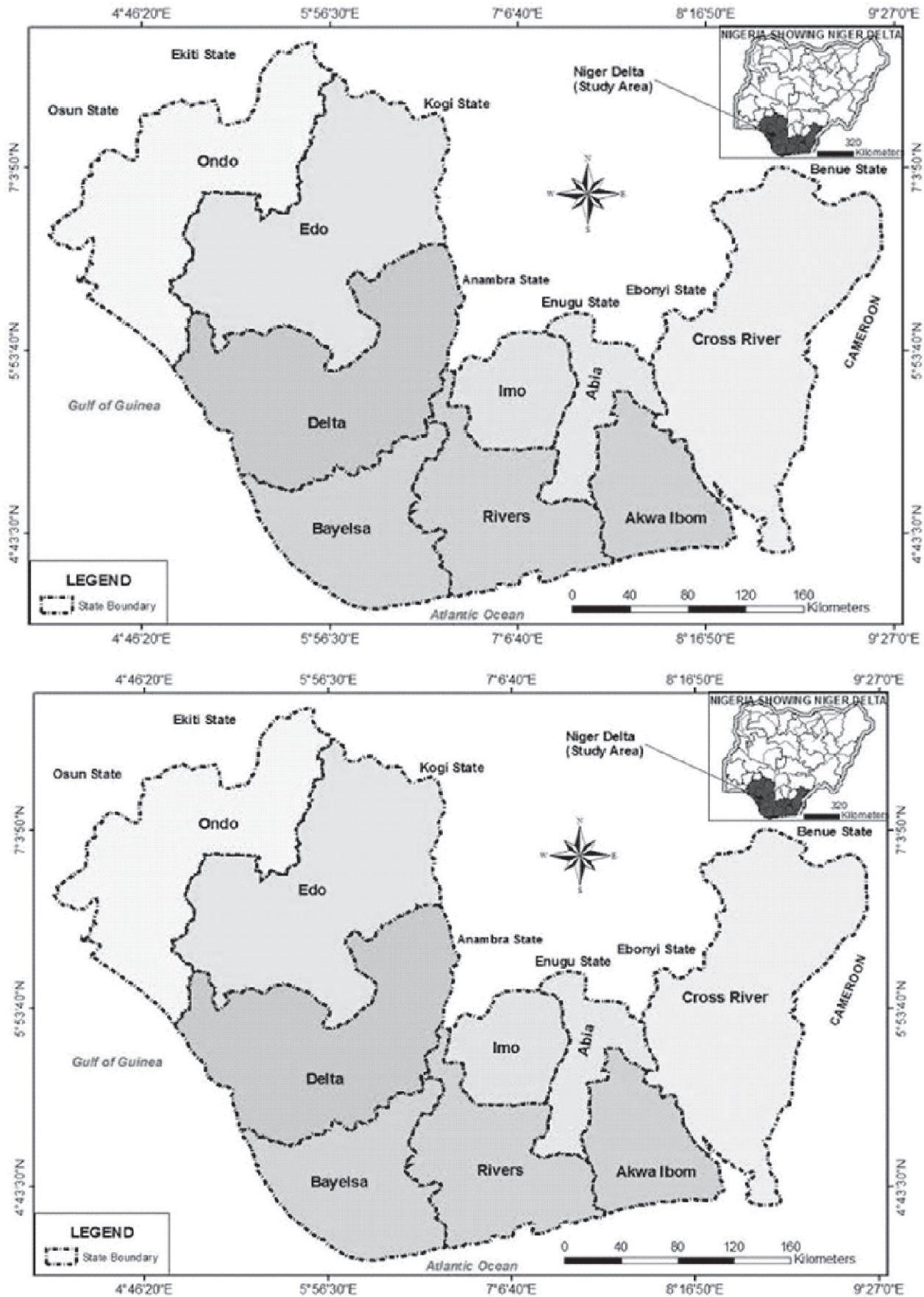
The study was guided by one hypothesis as stated

below;

1. Knowledge of computer screen reader does not significantly have correlation with research skills among public university students with visual impairment in six Geo-political South-South zones of Nigeria.

### **Methodology**

The research adopted correlational survey design. This design was applied for the reason that the independent and dependent variables associated together. Also, the design provided a direct positive and negative correlation between the variables. The study was conducted and collected a considerable amount of data from a small number of respondents to retrieve facts for the findings from the population under study. The work was done in public universities across South-South states (Figure 2). Area of the study consisted of six South-South educational districts. They included Cross-River, Akwa-Ibom, Rivers, Bayelsa, Delta and Edo. The population consisted of 13 public universities in the six South-South senatorial districts (Appendix 1). This small population of 34 students who have visual impairment was used as sample size. Instrument created for data collection was a research-developed instrument titled 'Screen Reader Research Skills Questionnaire (SRRSQ). This questionnaire had 2 sections of A and B. Section A consisted of personal data of respondents (students with visual impairment) while section B contained 40 items of research skills and computer screen reader together. The instrument was validated by the two experts. One expert from test and measurement unit while Cronbach Alpha was used to test the reliability and the coefficient obtained was 0.947. Data was collected from the questionnaire distribution and coded then scored. Finally, SPSS was introduced for analysis with the use of simple and multiple regressions.



**Figure 2.** Map of South-South states of Nigeria: Area of the study consisted of six South-South educational districts. They included Cross-River, Akwa-Ibom, Rivers, Bayelsa, Delta



and Edo. (Source: Effiong et al, 2021).

does not significantly have correlation with research skills among public university students

## Results

**Ho1:** Knowledge of computer screen reader

**Table 1:** Result of Simple regression analysis of correlation between knowledge of computer screen reader and research skills among public university students with visual impairment in six Geo-political South-South zones of Nigeria

	Sum of Squares	Df	Mean Square	F-ratio	p-value
Regression	423.383	1	423.383	14.369	.001 <sup>b</sup>
Residual	942.882	32	29.465		
Total	1366.265	33			

<.05 level ( $F_{df 1,32} = 4.17$ )

Table 1, showed that at .05 level of significance, the critical F ( $F_{df 1,32}$ ) value established in finding the correlation between knowledge of computer screen reader and research skills is 4.17 since F-Ratio (14.369) is greater than the critical F-value (4.17). From the result, the null hypothesis which stated that 'Knowledge of computer screen reader does not significantly have correlation with research skills among public university students with visual impairment in six Geo-political South-South zones of Nigeria' was rejected. Rather, there is a significant ( $p < .05$  level) positive correlation between knowledge of computer screen reader and research skills among public university students with visual impairment in six Geo-political South-South zones of Nigeria.

## Discussions of findings

Hypothesis 1 which was stated in a null form was rejected while the alternate was accepted. This implies that 'knowledge of computer screen reader significantly correlates with research skills among public university students with visual impairment in six Geo-political South-South zones of Nigeria'. This finding is in agreement with a research carried out by Oyewole and Afolabi (2014) on 'knowledge of computer screen readers by the blind and students with visual impairment in Nigerian universities'. The major findings of the study were that 40% of the students had knowledge of screen readers and the major challenges faced as

a result of this knowledge barrier by the students included limited access to digital contents, inability to use educational tools and software's, great reliance on others for with digital tasks, slower task completion, technical difficulties, limited participation in collaborative and online learning environments, and a host of others. Similarly, Afolabi and Akinyemi (2018) examined computer screen reader knowledge. The purpose of the study was to investigate the knowledge of computer screen readers among visually impaired students in Nigerian universities. The study used a descriptive survey design. A questionnaire was developed and administered to 150 students who are visually impaired from five universities in Nigeria. The study found that only 54% of the students were knowledgeable of screen readers. It was also discovered that the most common difficulties encountered as a result of knowledge barrier of the screen reader were lack of training, the difficulty of navigating websites and lack of accessible software's.

## Conclusion

Public universities students with visual impairment come across numerous challenges in the area of independent research. Those students who have thorough understanding/knowledge about computer screen reader cultivate up-to-date research skills. Further, the positive correlation implied that the assistive technology (computer screen reader) when understood can



significantly contribute to academic success of the students who are visually impaired in universities. Therefore, in-depth knowledge of the equipment will improve their research skills.

### Recommendations

Based on the result, the following recommendations below were made;

1. Comprehensive training of each student with visual impairment for acquisition of knowledge in computer screen reader is of necessity and should be arranged by public university administrators through workshops, conferences, seminars, and so on.
2. Knowledge of screen reader by students who have visual impairment should form part of academic curriculum for creation of research skills.
3. Academic and non-academic staffs of special needs education in public universities are expected to likewise undergo training for them to have knowledge of computer screen reader and in turn teach the students about the resource for on-line research consumption.

There should be encouragement of peer mentoring whereby students who have sight and understand the screen reader thereby assist the students with severe vision loss. This can produce collaborative learning environment and enhance research skill acquisition.

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