

Investigation Of The Utilization Of Assistive Technological Tools Among Special Teachers Primary Schools In North-Central, Nigeria

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Abstract: *The study focused on the utilization of assistive technological tools among special primary school's teachers in North-Central, Nigeria. The research design used for the study was survey. Purposive sampling technique was adopted to select the seven special government primary schools in the North-Central, Nigeria. Data for this study was collected through the use of questionnaire instrument tagged QUUAT (Questionnaire on the utilization of assistive technological tools) with the reliability coefficient of 0.85 on utilization at 0.05 alpha respectively. The respondents were mainly 136 special primary schools teachers of all the selected schools in the North-Central, Nigeria. Frequency and percentages was adopted to analyze data collected while ANOVA was used to test the stated hypotheses. The findings revealed that there was no significance difference on gender of teacher utilization of assistive technological tools for instruction in special schools North-Central Nigeria. It was therefore recommended that there should be professional development program in form of seminars and workshops to ensure that assistive technological tools are adequately, effectively and efficiently utilized. Moreover, schools for special students should be well equipped with high tech assistive technological tools to enable them to compete with their colleagues in any part of the world.*

Keywords; *Assistive technological tools, utilization, special schools, primary schools, North-Central, Nigeria*

I. INTRODUCTION

Special education program is a customized education made available for the exceptional student who has some disabilities or to the students that are under privilege to the extent that they cannot benefit fully from normal school work or that make their education in a conventional way a failure and of low benefit Babatunde, (2012).

Assistive technology refers to a broad range of devices, strategies and practice that are conceived and applied to solve the problems faced by individuals who have disability (Cook

& Hussey 2008). Individual with Disability (IWDs) includes all persons who have long term physical, emotional, mental, sensory impairment and who are prevented by different attitudinal and environmental barriers (Children Right for People with Disability (2016). According to Individuals with Disabilities Education Act (IDEA 2016) 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 a disability". Raskund, (2009) defined assistive technology to include any item, piece

of equipment or system that help people bypass, work around or compensate for learning difficulties. Assistive technologies existed in various categories; these may include (commercially available or homemade devices that are specially designed to meet a unique needs and functional capabilities of a particular individual student. Combining universal design for learning and these assistive technology tools can create a new generation of flexible curricula and materials that accommodate each student's strength, weakness, interest and background knowledge Zascavage & Winterman, (2009)

Assistive technologies are latest technologies that modifies or adapt the classroom for special learning needs (Shell, Cashana Cunter & Cunta (2006). Assistive technological tool in teaching student who have physical, sensory or cognitive disabilities is innovative technology. Innovative technology provides teachers with twenty-first century technological tools (High-tech tools) to help students with special needs overcome disabilities that block or impedes their learning process. According to America Foundation for the Blind (2012) assistive technology is any tool that helps the student with special needs to do things more quickly, easily or independently relative to their impairment such as braille for the visually impaired, cochlear for hearing impaired among others.

More so, according to Nsofor and Bello (2015), the assistive technological tools now follows the order; No-tech (walking stick), Low-tech (pencil grip, highlighters, read to out loud, note taker, colour coding), Medium-tech (spell checkers, talking calculator, word prediction, text to speech, speech to text,) and High-tech (computers, smartphones, magnification software, scanning access, voice recognition, environmental control devices) among others. In this twenty-first century, physically challenged require assistive technological tools of High-tech to be able to compete with their counterpart all over the world. Each technological level of assistive technological tools differs in quality and effectiveness thus, the assistive technological tools has been updated to high --tech from No-tech. With the rapid growth of new media learning tools, assistive technology teachers and students are presented with various options for interacting with displaying and viewing information in non-textual form Pisha & Coyno, (2017). The categories of assistive technology include; (i) Academic and learning Aids (ii). Aids for daily living; (iii). Assistive listening devices and environmental aids (iv). Augmentative communication aids (v) Computer access and instruction aids (vi) Environmental control aids (vii) Mobility Aids (viii) Pre-vocation and vocational aids (ix). Recreation and leisure aids among others. Assistive technology is one of the greatest achievements of science and technology ever recorded; thereby providing solutions to problem initially look like insurmountable one. The technological level of assistive technology improves by geometric progression there by living no stone unturned (Nsofor & Bello, 2015).

Availability and utilization of assistive technology is a pre-condition for achieving equal opportunities, enjoying human rights rather than being deprived and living in dignity for students with special needs. These make it possible for each child with disabilities to flourish and become productive member of the society instead of being redundant and not

living a fulfilled life. Assistive technologies are so much important in the remarkable success of technology, because variety of technological devices were developed to enhance learning independence of students with various categories of disabilities (Special Education Assistive Technology, 2018).

In the same way, as important as assistive technology is to the physically challenged one tends to ask are they available? In Educational process, availability of assistive technologies offers student support that meets their needs (McKnight & Davies 2013). Availability of assistive technological tools in this context relates to how much assistive technological devices and tools are on hand, to which teachers and learners have access to for getting the best from the physically challenged students in every area of disabilities ranges from sight impairment to mental retardation even on sports. Therefore, availability of assistive technologies for teaching the physically challenged are instrumental to quality and quantity education for both inside and outside learning activities (Olison & Deruyter, 2007). The availability of these can help education to be successful. Thus, the absence of these can make the physically challenged student to be poorly socialized, uneducated, wrongly informed, half trained and become unskilled individual s (Carpenter, 2011). Many studies has been carried out on the availability and utilization of instructional material as a vital instrument in teaching and learning process for the able students example of which are Nsofor, (2010); Onu, and Igbo, (2013), Tuimur, 2015) and many others . The failure of the school to meet the expectation of the students with special needs has led to poor academic performance, frequent absenteeism and dropping out. Farrel and Shafika (2007), Yussuf and Fakomogbon, (2008) are of the opinion that very few researchers have examined the application of assistive technology for the students who are physically challenged in Nigeria context. Hence, there is need to carry out more studies on the availability of assistive technological tools in the special schools in Nigeria.

Moreover, even if assistive technological tools are available are they being utilized? Utilization of assistive technological tools refers to the usage degree of a given assistive technological tools or devices for students with special needs in the execution of a given task. Findings on utilization of instructional materials for effective implementation of education at all levels has been carried out by various researchers such as Iyunade, (2014); (Omeka, Okpalaoka, Ugwuoke (2016) but only few has done that on the special schools that need it most.

High efficiency in the utilization of assistive technological tools cannot be achieved on the parts of the teachers in special government primary schools without considering the teachers academic qualification. The success and failure of any educational program according to Ngada (2007) solely depends on the availability of qualified (professional), competent and dedicated teachers. The ability of a special school teacher in the art of teaching is not derived only from academic background but based on the pillar of outstanding pedagogical skills acquired (Seweje & Jegede, 2017).

It has been recorded that the realization of National growth in technology as highlighted in the national policy on

education hinders among others largely on the quality of teachers in special government primary schools in Nigeria

STATEMENT OF THE RESEARCH PROBLEM

In developed countries of the world education is made compulsory for all citizen and students in terms of design, environmental demands, economic empowerment, social demands and individual interest UNESCO, (2016). Education in developed countries accommodates citizens with divers ability whereby those with special needs are not left behind in every tier of education. Thus, the developed countries have fully embraced the potentials of assistive technology even at high technological level as it supports students with special needs to learn independently, easily, quickly and efficiently Integrating assistive technologies into their curriculum in Nigeria has not been fully embraced by most teachers. The question is why? Could it be for these reasons- (a) apprehension when using unfamiliar technology, (b) a lack of training, (c) the absence of facilitating condition, and (d) teacher self- efficacy? The set back in the process of special education has been a concern to many researchers, who have investigated into the root causes. .Despite the increase awareness of assistive technologies, limited research has been conducted on it. The success of special education programs depends largely on the availability and utilization of assistive technological tools. Thus, this study sought to investigate the utilization of assistive technological tools among teachers of special government primary schools.

OBJECTIVES OF THE STUDY

The main objective of this study is to investigate the utilization of assistive technological tools special teacher primary schools in North Central, Nigeria.

The specific objectives are to;

- ✓ Investigate the extent of utilization of assistive technological tools by teachers in special government primary schools in North-Central Nigeria.
- ✓ Investigate the extent of utilization of assistive technology tools by teachers in special government primary schools in North-Central Nigeria based on gender

RESEARCH QUESTIONS

The following research questions were raised to guide the study;

- ✓ What is the extent of utilization of assistive technological tools among teachers in special government primary schools in North Central, Nigeria?
- ✓ What is the difference in the mean response of male and female teachers on the extent of utilization of assistive technological tools in special government primary schools in North Central, Nigeria?

HYPOTHESES

The following null hypotheses were formulated and tested at 0.05 alpha level of significance

H₀₁: There is no significant difference between male and female teachers on the utilization of assistive technological tools in special schools North Central Nigeria.

II. METHODOLOGY

This research design used for the study was survey. Purposive sampling technique was used to select seven special government primary schools in the North-Central, Nigeria. The selected schools are; Niger State School of Special Education, Minna; Kwara State School for Physically Challenged, Ilorin; Christian Mission in Many Lands Special School Iyale, Kogi State; Comprehensive Special School Lafia, Nasarawa State; St Francis School for the Hard of Hearing and Visually impaired, Vandeikya, Benue; Islamiya Pilot Science Primary School, Jos and Federal Cappel Territory School for the Visually impaired, Jabi, Abuja. The seven school selected were specially selected being the only special government primary school in each state of the North-Central, Nigeria. The research instrument used for data collection was an adapted questionnaire tagged Questionnaire on the utilization of assistive technological tools in special schools and Assistive Technology checklist (QUUAT) which was validated by two lecturers from Federal University of Technology, Department of Educational Technology, Minna, one lecturer from Federal Capital Territory College of Education, Department of Educational Technology, Zuba, Abuja and a school administrator School/ teacher from the Federal Capital Territory School for the Blind, Jabi, Abuja. The QUUAT is divided into two sections. Section A (demographic information) and section B was on the variable utilization).The modified version were personally administered by the researcher to 136 respondents in respondents in the six school selected for the study. Purposive sampling technique was used to pick teachers from the special schools in all the six school sampled for the study. Cronbach alpha was used to validate the reliability of the instrument; reliability coefficient for availability was 0.91 while the reliability coefficient for utilization was 0.85. The data were collected and analyzed using descriptive statistical tools of frequency counts and percentages. Inferential statistics analysis of variance (ANOVA) was used to test the hypotheses at 0.05 level of significance using statistical package for social sciences (SPSS) version 23.0.

S/N	Name of School	State LGA	Type of Sc Number
1	Niger State School for Special Education	Niger	Pub 32
2	Kwara State School for Special Needs ,Apata Yakuba,Ilorin	Kwara Ilorin East	Pu 18
3	School for the Handicap Iyale Ayingba, Kogi	Kogi Dekina	Pub 21
4	Comprehensive Special School Lafia.	Nassarawa Lafia	Pub 31
5	St Francis School for the Deaf and Blind. Vandeikya, Benue	Benue Vandeikya	Pub 13
6	Islamiya Pilot Science Primary School (Inclusive) Jos	Plateau Jos North	Pub 21

7	FCT School for the blind Jabi, Abuja Total	Abuja AMAC	Pu 20 PSc 156
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Table 1: Population of teachers in the seven special government primary schools

In table 1, 136 copies of the instruments that were administered were retrieved from the six special government primary schools in the North-Central, Nigeria.

III. RESULTS

The result of this study are presented in this section

RESEARCH QUESTION 1: What is the extent of utilization of assistive technological tools among teachers in special government primary schools in North Central, Nigeria?

S/N	ITEMS	N	Frequency count	Percentage	DECISION
UT1	Adjustable table	136	78	57.4	YES
UT2	Wrist rest	136	66	48.5	NO
UT3	Key guard	136	76	55.9	YES
UT4	Sticky key	136	66	48.5	NO
UT5	Slow key	136	80	58.8	YES
UT6	Repeat key	136	72	52.9	YES
UT7	Miniature keyboard	136	86	63.2	YES
UT8	Braille with numbers	136	111	81.6	YES
UT9	Braille (alphabets)	136	107	78.7	YES
UT10	Dictation software	136	65	47.8	NO
UT11	Magnification software	136	87	64.0	YES
UT12	Spell checkers	136	85	62.5	YES
UT13	Reading software	136	53	38.9	NO
UT14	Walkers (automatic and manual)	136	75	55.1	YES
UT15	Mouse key	136	102	75.0	YES
UT16	Pencil grip	136	80	58.8	YES
UT17	Switch input	136	89	65.4	YES
UT18	Scanner	136	99	72.8	YES
UT19	Mouse code	136	54	39.7	NO
UT20	Talking computer	136	97	71.3	YES
UT21	Overlay keyboard	136	85	62.5	YES
UT22	Model mock-up	136	79	58.1	YES
UT23	Word Processing mechanism	136	57	41.9	NO
UT24	Art activities	136	72	52.9	YES
UT25	Talking dictionary	136	81	59.6	YES
UT26	Disk recording	136	78	57.4	YES
UT27	Electronic organizer	136	79	58.1	YES
UT28	Hearing aids	136	84	61.8	YES
UT29	Frequency modulated (FM) system	136	57	41.9	NO

Decision mean = 50%

Table 2: Frequency and Percentage of responses of teachers on the level of utilization on the use assistive technological

tools in special government primary schools North-Central, Nigeria

Table 2 shows the frequency count and the percentages of each assistive technological tool responses of teachers' on extent of the utilization of assistive technological tool for instruction in special school. It indicates that higher percentage of assistive technological tools are been used for teaching and learning activities in the special government primary schools in North-Central, Nigeria. The table reveals that adjustable table, key guard, slow key, repeat key, miniature keyboard, braille with numbers, braille (alphabets), magnification software, spell checkers, walker(automatic and manual), mouse key, pencil grip , switch input, scanner, talking computer, overlay keyboard, model mock-up, art activities, talking dictionary,, disk recording, electronic organizer and hearing aids are been utilized with following percentages respectively; 57.4, 55.9, 58.8, 52.9, 63.2, 81.6, 78.7, 64.0, 62.5, 55.1, 75.0, 58.8,65.4, 72.5, 71.3, 62.5, 58.1, 52.9, 59.6,57.4,58.1 and 61.8. The table also indicates that wrist rest, sticky key, dictation software, reading software, mouse code, word processing mechanism and frequency modulated system are not being utilized with the following percentages 48.5, 48.5, 47.8, 38.9, 39.7, 41.9 and41.9 respectively. The table also reveals that the utilization of assistive technological tools in special schools was favorable. The respondents were in agreement with the items stated in the research instrument on utilization. Also the items percentages rating between 50% and above were all considered been utilized (accepted based) while percentages rating of values less than 50% are considered not been utilized based on the decision rating of 50%.

RESEARCH QUESTION 3: What is the difference in the mean response of male and female teachers on the extent of utilization of assistive technological tools in special government primary schools in North Central, Nigeria?

S/N	ITEMS	Male % Res	Female % Res	N	Fe R	Fe % Res	DECISION M/F
UT1	Adjustable table	39	55.7	66	39	59.1	YES, YES
UT2	Wrist res	34	48.6	66	32	48.5	NO, NO
UT3	Key guard	39	55.7	66	37	56.1	YES, YES
UT4	Sticky key	37	52.9	66	29	43.9	YES, NO
UT5	Slow key	39	55.7	66	41	62.1	YES, YES
UT6	Repeat key	34	48.6	66	38	57.6	NO, YES
UT7	Miniature keyboard	44	62.8	66	42	63.6	YES, YES
UT8	Braille with numbers	53	75.7	66	58	87.9	YES, YES
UT9	Braille (alphabets)	50	71.4	66	57	86.4	YES, YES
UT10	Dictation software	37	52.9	66	28	42.4	YES, NO
UT11	Magnification software	44	62.9	66	43	65.2	YES, YES
UT12	Spell checkers	45	64.3	66	40	60.6	YES, YES

UT13	Reading software 70	24	34.3	66	29	43.9	NO, NO
UT14	Walkers (automatic and manual)70	37	52.9	66	38	57.6	YES, YES
UT15	Mouse key 70	54	77.1	66	48	72.7	YES, YES
UT16	Pencil grip 70	42	60.0	66	38	57.6	YES, YES
UT17	Switch input 70	47	67.1	66	42	63.6	YES, YES
UT18	Scanner 70	53	75.7	66	46	66.7	YES,Y ES
UT19	Mouse code 70	24	34.3	66	30	45.5	NO, MO
UT20	Talking computer 70	50	71.4	66	47	71.2	YES, YES
UT21	Overlay keyboard 70	45	64.3	66	40	60.1	YES, YES
UT22	Model mock-up 70	42	60.0	66	37	56.1	YES, YES
UT23	Word Processing mechanism 70	27	38.6	66	30	45.5	NO, NO
UT24	Art activities 70	38	54.3	66	34	51.5	YES, YES
UT25	Talking dictionary 70	37	52.3	66	44	66.7	YES, YES
UT26	Disk recording 70	39	55.7	66	39	59.1	YES,Y ES
UT27	Electronic organizer 70	39	55.7	66	40	60.6	YES,Y ES
UT28	Hearing aids 70	40	57.1	66	44	66.7	YES,Y ES
UT29	Frequency modulated (FM) system70	28	40.0	66	29	43.9	NO, NO

Table 3: Frequency and Percentage of extent of utilization responses of male and female teachers on usof assistive technological tools in special schools North Central, Nigeria

The Table 5 shows the percentages of utilization of male and female teachers on the use of assistive technological tools for instruction. It was observed that both male and female teachers possess high utilization skill of assistive technological tools in special government primary schools. It was revealed from the table that both male and female teachers utilizes the assistive technological tools to great extent of about 82.8%. However, out of the sampled assistive technological tools (29), only five (5) of them were not utilized at all while two (2) were fairly utilized. The percentages of the utilized assistive technological tools with reference to male and female teachers are as follows respectively; Adjustable table 55.7 and 59.1, Key guard 55.7 and 56.1, Slow key 55.7 and 62.1, Miniature keyboard 62.8 and 63.6, Braille with numbers 75.7 and 87.9, Braille (alphabets) 71.4 and 86.4, Magnification software 62.9 and 65.2, Spell checkers 64.3 and 60.6, Walkers (automatic and manual) 52.9 and 57.2 Mouse key 77.1 and 72.7, Pencil grip 60.6 and 57.6, Switch input 67.1 and 63.6, Scanner 75.7 and 66.7, Talking computer 71.4 and 71.2, Overlay keyboard 64.3 and 60.1, Model mock-up 60.0 and 56.1, Art activities 54.3 and 51.5, Talking dictionary 52.3 and 66.7, Disk recording 55.7 and 59.1, Electronic organizer 55.7 and 60.6, Hearing aids 57.1 and 66.7. Among the twenty-nine sampled assistive technological tools only two (2) were poorly utilized which are Sticky key and Repeat key. Moreover, the table shows that the male and female teachers response does not differ in the following assistive

technological tools indicating that they were not utilized at all; Dictation software, reading software, Mouse code, Word processing mechanism and frequency modulated system. This indicates that higher percentage of both male and female have similar opinion on the utilization of assistive technological tools in special government primary schools north Central Nigeria. The result of this table translate to positive utilization of male and female teachers on the use of assistive technology for teaching in special schools in North Central Nigeria based on the results of analysis of research question eight.

NULL HYPOTHESIS

H_{01} There is no significant difference between male and female teachers on the utilization of assistive technological tools in special schools North Central Nigeria.

	Sum of Squares	D f	Mean Square	F	Sig
Between Groups	23.763	1	23.763	0.388	.537
Within Groups	8210.473	134	61.272		
Total	8234.235	135			

$P > .05$

Table 7: Summary of ANOVA male and female teacher utilization in the use of assistive technologies tool in special school in North Central, Nigeria?

The hypothesis stated there was no significant difference between male and female teacher utilization in the use of assistive technological tool in special school in North Central, Nigeria. Revealed $f(2, 134) = .388$ $p = .537$. With this finding, the hypothesis was accepted because p-value of .536 on the table was greater than the pre-set level of significant of $p > .05$. The null hypothesis was therefore accepted. This implies that there was no significant difference between male and female teacher utilization in the use of assistive technologies tool in special school in North Central, Nigeria. On this basis hypothesis four was not rejected.

IV. DISCUSSION

There was no significant difference between male and female special school teacher's opinion on the availability of assistive technology tools in special schools in North Central, Nigeria. This is in agreement with (Ani & Inan 2010) who carried out a research on the assistive technology needs of university students with disabilities and the availability of these technologies in Turkish universities. It was revealed in their study that assistive technologies were available for student with disabilities and been utilized for different purposes such as writing. Also in agreement with findings of (Lerslip, 2016) who carried out investigations on the provision, usage and the needs of assistive technology and educational services for students with disabilities in higher education. It was revealed from his study that assistive technology tools were provided and been used for students with special needs. But, in contrary with research of (Afework, 2014) that investigated research on availability of school facilities and

their impacts on quality of education in 24 primary schools in Eastern Harage Zone. The result of the study indicated that the school facilities meant for instructional purposes are not available.

It was observed that there was no significant difference between male and female teachers in the utilization of assistive technology tools in special schools in North Central, Nigeria. Oira, (2016) who carried out a study on the use of modern assistive technology and its effects on the educational achievement of students with visual impairment at kibos special secondary school, Kisumu county, Kenya. The result of this study shows that the majority of the teachers lacked appropriate skills to accurately identify the needs of this learner so as to select the appropriate assistive technology appliance. Also Young Mi Klin (2010) carried out a study on the gender role and the use of university library website. It was revealed that male is more goal performance oriented than females in the utilization.

V. SUMMARY OF FINDINGS

The findings of the study were that;

- ✓ Adjustable table, Wrist rest, Key guard, Sticky key, Slow key, Repeat key, Miniature keyboard, Braille with numbers, Braille (alphabets), Magnification software, Spell checkers, Walkers (automatic and manual), Mouse key, Pencil grip, Switch input, Scanner, Talking computer, Overlay keyboard, Model mock-up, Art activities, Talking dictionary, Disk recording, Electronic organizer and Hearing aid are the assistive technological tools are being under-utilized in special government primary schools North Central, Nigeria.
- ✓ Braille (alphabets) and Hearing aids are the assistive technological tools are being utilized for instructional purposes in the special government schools North Central, Nigeria.
- ✓ Dictation software, Reading software, Mouse code, Word processing mechanism and Frequency modulated system are the assistive technological tools were not utilized at all in the special government primary schools North Central, Nigeria
- ✓ There is significant difference between male and female teachers level of utilization of assistive technological tools in special government primary schools North Central, Nigeria.

VI. CONCLUSION

Based on the findings of the study, it can be concluded that there is inadequate provision of assistive technology tools by the government and underutilization of the tools by the teachers. Workshops and seminars should be organized for capacity building of the teachers, technician and supporting staffs which are the facilitating conditions for effective and efficient utilization of assistive technological tools in special schools.

VII. RECOMMENDATION

In view of the findings of the research, the following recommendations are made;

- ✓ The federal government through the federal ministry of education science and technology should recognize the potential of assistive technological tools in supporting education achievement for student with special needs. Hence, making assistive technological tools available is highly necessary because anyone could be a potential beneficiary.
- ✓ Teachers, students, parents, guidance and all stake holders of institution managing students with special need should be sensitive about the on ending benefit associated with assistive technology so that everybody work together embracing it for accomplishing the stated goal and objective of education when properly utilized.
- ✓ There should be a professional development program in form of seminars and workshops to ensure that assistive technological tools are adequately, effectively and efficiently utilized whether in the rural or urban settings.
- ✓ School for special student should be well-equipped with high tech assistive technological tools which are less bulky, quick, easier to use and motivating as it encourages independence in learning.
- ✓ All tertiary institutions (Universities and Colleges of Education) in their respective faculties are expected to create compliance on teacher education coursework.
- ✓ There should be proper utilization of assistive technological tools in primary school being the foundation for further studies.
- ✓ Special education evaluators should supervise and monitor teaching process regularly.
- ✓ Special school teachers should be provided with adequate incentives
- ✓ Assistive technological tools should be secured.

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