

ASSESSMENT OF THE FACILITATING CONDITIONS AND SELF-EFFICACY OF TEACHERS ON ASSISTIVE TECHNOLOGY TOOLS IN SPECIAL EDUCATION PRIMARY SCHOOLS IN NORTH-CENTRAL NIGERIA

KAREEM, M. A., NSOFOR, C.C., & TUKURA, C. S.

Department of Educational Technology,
Federal University of Technology, Minna, Nigeria

E-mail: kmaryayanjoke@yahoo.com Phone No:

Abstract

The study investigated the facilitating condition and self-efficacy of teachers on assistive technology tools in special education primary schools in North Central, Nigeria. The research design for the study was survey type. The population of this study was 156 (101 male and 55 female) teachers teaching in all the seven special primary schools in North Central, Nigeria while the sample for the study was 136 (89 male and 47 female) teachers. Purposive sampling technique was adopted to select each special government primary school in each state the North Central, Nigeria. Four research questions and two hypotheses guided the study. This study adopted a descriptive survey research design. The research instrument for the study was questionnaire. The researcher adapted questionnaire on the facilitating condition and self-efficacy of assistive technological tools (QFCSEATT). The research instrument 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, Abuja, and one administrator from the Federal Capital Territory School for the Blind, Abuja. Cronbach alpha reliability coefficient was applied in testing the reliability level of the instrument which yielded reliability coefficient of 0.91 and 0.95 respectively. The data obtained were analyzed using mean and standard deviation for research questions while t-test was employed to test hypotheses. Finding revealed that there are facilitating conditions for assistive technological tools usage in special education primary schools in North-Central, Nigeria. Finding showed that there was no significant difference in the perception of male and female teachers on facilitating conditions influencing the use of assistive technological tools in special education primary schools in North-Central, Nigeria. Finding also revealed that there was no significant difference between male and female teachers' self-efficacy level in the use of assistive technological tools in special education primary schools North Central Nigeria. It was therefore recommended that government should create a conducive and facilitating environment for learning which will serve as motivation for the students. Teachers should be trained and re-trained on the use of assistive technology to increase their self-efficacy level in handling assistive technological tools and others.

Keywords: Assistive Technology, Facilitating Condition and Self-Efficacy

Introduction

Education is seen by individual as the key to be a successful citizen and contributing member in the society. It is defined as a teaching-learning process between the teacher and the learner in a conducive environment in which knowledge is gained and such knowledge brings about change in learners behaviour. It is the totality of life experiences that people acquire over time which equip them in order to survive and get satisfied when living in the world (Bamiro, 2012). In any society, all children, including children with various educational needs have right to education which is appropriate to their needs (National Council for Special Education, 2014). Human rights and equality are being promoted for people with physical challenges in reference to the education of physically challenged pupils. The goals of education cannot be achieved without the use of instructional materials in the teaching and learning process. Aramide and Bolarinwa, (2015) were of the opinion that instructional materials have the ability to enhance students' learning.

Assistive technology tools are specific instructional materials for students with special needs. Some have cognitive impairments, learning disability, physical disabilities and chronic health problems. When managing children with disabilities, many challenges come up to both families at home and professionals at school. One of the major challenges facing teachers and the professionals in the field of education is meeting the social, behavioral, cognitive, perspective and psychomotor needs of children with learning disabilities in the classroom (Liman, Adebisi, Jerry & Adewale, 2015). It offers many students with disabilities the ability to meet their full potential within their educational programme. Examples of assistive technology tools are walking stick, pencil grip, highlighters, read out loud, note taker, colour coding, spell checkers, talking calculator, word prediction, text to speech, speech to text, magnification software, scanning access, voice recognition, environmental control devices. These include custom-fitted wheelchairs, standing frames, head supports, adapted desk/tables, hearing aids, Braille, pencil grip, highlighters, read to out loud, note taker, colour coding among others. High-tech assistive technology systems incorporate a wide range of levels for all aspects of life skills (Edyburn, 2009; Nsofor & Bello, 2015). Pisha and Coyno (2017) opined that assistive technology tools can be categorized into academic and learning aids, aids for daily living, assistive listening devices and environmental aids, augmentative communication aids, computer access and instruction aids, environmental control aids, mobility aids, and pre-vocational and vocational aids. The availability of assistive technology tools alone cannot enhance quality education for children with special needs therefore, necessary facilitating conditions must be present to facilitate its utilization by both teachers and learners.

Facilitating condition refers to the degree to which technology infrastructures exist to support the use of a particular system or tools. The facilitating conditions for the use of assistive technology ranges from student familiarity with the assistive technology tools, technical resources available, system compatibility, affordability, accessibility, adaptability, presence of stable/steady power supply among others (Chalghoumi & Veins, 2009). Connor, Snell, Gansneder and Dexter (2010) investigated factors that are predictive of integrating assistive technology into teaching practices among general and special education teachers of students with severe disabilities. Out of seven independent variables, teacher preparedness was determined to be the primary significant predictor of student assistive technology use. In the same vein, Lersilp, Putthinoi and Lersilp (2018) carried out a study on the facilitating conditions and barriers of Assistive Technology (AT) and the learning environment for children with special needs in special education schools in Chiang Mai, Thailand. The results in terms of AT showed that a majority of children with physical disability needed it for mobility and use of school buildings and those with hearing disability for communication.

However, most of the children did not need to use AT for culture, recreation, or sports, while many considered it as a facilitator for education. In terms of the learning environment, most characteristics of the physical environment were facilitators for children with special needs, as were those of the social environment for all groups of such children. Wairimu, Chomba and Awori (2018) sought to identify factors that influence the use of Assistive Technology (AT) in teaching Mathematics to learners with VI in special primary schools for the Blind in Kenya. The study established that the major factors influencing use of AT devices included: inadequate time for syllabus coverage, high cost of AT devices, inadequate teacher training in the use of AT devices, rigid curriculum and negative attitudes of learners. The study recommends that: the government should allocate more funds for AT devices and conduct regular classroom supervision to ensure efficient use of AT devices. Despite the existence of facilitating conditions, the extent to which there is appropriate knowledge to make use of assistive device is a matter of concern. If the required assistive technology tools are available and the facilitating conditions are in place without considering the self-efficacy of the teachers in special school, the desired result cannot be achieved.

Self-efficacy can be defined as the belief in ones' ability and capabilities to organize and execute the courses of action required to produce a given outcome (Bandura, 2008). Teachers in special education schools with low level of self-efficacy will feel uncomfortable using assistive technology and will be unlikely to incorporate the use of assistive technology in the classroom. This may be due to associating fear with using devices/tools or having limited experience in using such tools (Farah, 2011). Therefore, teachers with low self-efficacy cannot cope with the wide range of technological innovation of this age. Thus, there is utmost demand to determine the extent of self-efficacy of teachers in special education schools for proper utilization of assistive technological tools. Ogirima, Ohawuiro and Oyeniran (2017) examined teachers' competence in the use of assistive technologies in special needs schools. Findings revealed that teachers were not competent in the use of assistive technologies. Gender and teaching experience did not influence teachers' attitude and competence in the use of assistive technologies.

Research on gender differences in school children's self-efficacy belief with regard to students' and teachers' perspectives were carried out by Chapez, Beltran, and Reyes (2014). 24 female teachers and 28 male teachers completed self-efficacy questionnaires and attainment tests. The study was conducted in two primary school classrooms in England. The results indicated that gender differences in self-efficacy were significant with male teachers holding a lower sense of self-efficacy than female teachers coupled with lower performance. The self-efficacy level of teachers significantly correlates with their performance but this relationship was lower than that of the female teachers in special education schools.

Special education schools are customized educational institutions created for the exceptional student who has some disabilities or to the students that cannot benefit fully from conventional school activities which is capable of making their education in a conventional way a failure or of low benefit (Babatunde, 2012). The aim of special education is to reduce the gap between students with special needs and other in terms of educational achievement. Students with special needs must like any able student be able to achieve well and competitively. This implies that adequate preparation should be put in place to cater for their needs and this revolves around assistive technology tools. Thus, this study is to assess the availability, facilitating condition, self-efficacy and utilization of assistive technological tools in special education schools in North Central, Nigeria.

There is no society that can evolve politically, economically and socially without positively harnessing the potentials of its citizens that are physically challenged persons. This is only achievable through functional education. The developed countries of the world who fully understand this fact have made every tier of education compulsory for all students including those with special needs. These developed countries have fully embraced the potentials of assistive technology thereby supporting students with special needs to learn independently, easily, quickly and efficiently. In Nigeria, the situation is different compared to developed countries of the world. Integrating assistive technologies into special education in Nigeria has not been fully embraced. This has made children with disabilities most likely to be less educated which has created a greater inequality between them and their peers without disabilities. Moreover, the laudable goal of special education for the special students depends on the facilitating condition and self-efficacy of teachers in handling assistive technology tools. This has been a major concern to many researchers, who have investigated into the root causes. However, in all the studies none has been able to address the situation in the areas of facilitating condition and self-efficacy. Also, to the best of the researchers' knowledge, no research has been carried out with respect to primary school special education in North-Central Nigeria. This study sought to assess the facilitating conditions and self-efficacy of teachers on assistive technological in special education primary schools in North-Central, Nigeria.

Research Questions

The following research questions guided the study:

- (i). What are the facilitating conditions influencing the use of assistive technology tools in special education primary special schools in North Central, Nigeria?
- (ii). What is the self-efficacy level of teachers on the use of assistive technology tools in special education primary schools in North Central, Nigeria?
- (iii). What is the difference in the mean response of male and female teachers on the factors influencing the use of assistive technology tools in special education primary schools in North Central, Nigeria?
- (iv). What is the difference in the mean response of male and female teachers on the self-efficacy level on the use of assistive technology tools in special education primary schools in North Central, Nigeria?

Research Hypotheses

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

- HO₁: There is no significant difference in the perception of male and female teachers' on facilitating condition influencing the use of assistive technological tools in special education primary schools in North Central, Nigeria.
- HO₂: There is no significant difference between male and female teachers' self-efficacy in the use of assistive technological tools in special education primary schools in North Central, Nigeria.

Research Methodology

This study adopted a descriptive survey research design. A descriptive survey research design is aimed at finding, describing, and reporting events without manipulation. The population of this study comprises of 156 teachers from all special education primary schools within the North-Central, Nigeria. Using a multistage sampling technique, seven special education primary schools were purposively selected and six out of these seven primary schools were randomly selected for the study while one of the schools was used for the pilot study. The sample size for the study was 136 teachers used for this study. The instrument for data collection was the researcher's developed Questionnaire on Facilitating Conditions and Self-Efficacy of Teachers on Assistive Technology Tools (QFCSETATT). The QFCSETATT was divided into three sections. Section A was used to collect demographic information while section B were sub-categorized into two (facilitating condition and self-efficacy). The data collection instruments went through face and content validation. Face and content validation was done by two experts in Educational Technology who are lecturers from Federal Capital Territory College of Education, Department of Educational Technology, Zuba, Abuja. The feedbacks from the lecturers were taken into consideration in the final draft of the instrument before it was pilot tested.

To determine the reliability of the instrument a pilot study was conducted using 20 (11 female and 9 male) teachers from a special school, Abuja who were part of the population but not part of the sample size was used for the pilot study. The reliability coefficient was determined using Cronbach alpha which yielded reliability coefficient of 0.91 from 10 items on facilitating conditions and 0.95 from 12 items on self-efficacy of teachers on assistive technology tools. The data collected in this study were analyzed using descriptive statistics such as mean and standard deviation to answer research questions. 5 point Likert scale was used for the instrument and a criterion rule of 3.00 was then used to determine the decision on the outcome of the mean and standard deviation obtained. Inferential statistics using t-test was used to test hypotheses at level $\alpha = 0.05$. The hypotheses were accepted because the p-value was higher than the alpha level of 0.05. Data analysis was done using the Statistical Package for the Social Sciences (SPSS) version 22.0.

Results

In order to determine the facilitating conditions influencing the use of assistive technological tools in special education primary schools in North-Central, Nigeria, mean and standard deviation was used which is reported in Table 1.

Table 1: Mean and Standard Deviation of Responses of Teachers on facilitating conditions influencing the use of assistive technology tools

S/N	Items	N	\bar{x}	SD	Decision
1.	Spacious and rich classroom environment will facilitate the use of assistive technology tools.	136	3.42	1.36	Agree
2.	Accessible school location and pleasant school environment will enhance effective use of assistive technology tools.	136	3.54	1.31	Agree
3.	The school building accommodates technology tools to help the movement of physically challenged students.	136	3.50	1.34	Agree
4.	Instructional materials are some of the assistive technology tools that create a facilitating condition for teachers use.	136	3.16	1.44	Agree
5.	Electricity and software application and many others assistive technology tools ensure good usage of assistive technology tools.	136	3.46	1.44	Agree
6.	Relevant facilities and assistive technology tools are available to enhance teaching and learning process in these special schools.	136	3.37	1.24	Agree
7.	Required supportive measures or guidance are available for the physically challenge students where necessary.	136	3.82	1.40	Agree
8.	Assistive technology tools in these special schools are handled by technicians for effective usage.	136	3.33	1.38	Agree
9.	Assistive technology tools to enhance reading and spelling are in good condition in the schools.	136	3.30	1.38	Agree
10.	The environment is conducive for the students to learn effectively in the schools	136	3.55	1.30	Agree
Average Mean			3.45		

Decision mean = 3.00

The table showed that the average mean for the response was 3.45 and standard deviation of 1.35. The average mean score is higher than the decision mean of 3.00. The facilitating conditions are spacious and rich classroom environment to facilitate the use of assistive technology tools; accessible school location and pleasant school environment to enhance effective use of assistive technology tools; the school building accommodates technology tools to help the movement of physically challenged students; instructional materials are available as some of the assistive technology tools that create a facilitating condition for teachers use among others. This implies that there are facilitating conditions for assistive technological tools usage for teachers' use in teaching and learning processes in special education primary schools in North-Central, Nigeria.

In order to find out the level of self-efficacy of teachers in the use of assistive technological tools in special education primary schools in North Central, Nigeria, mean and standard deviation was used which is reported in Table 2.

Table 2: Mean and Standard Deviation of Responses of Teachers on Self-Efficacy on the Use Assistive Technological Tools in Special Education Primary Schools North-Central, Nigeria

S/N	Items	N	\bar{x}	SD	Decision
1.	I have enough skills to work with braille for special students.	136	3.44	1.32	Agree
2.	I have enough skill to work with spell checkers for special students.	136	3.39	1.43	Agree
3.	I can use assistive technological tools for special school students effectively	136	3.39	1.38	Agree
4.	I don't encounter problems using their assistive technological tools for special students.	136	3.40	1.25	Agree
5.	I attend training, seminars, workshop, conferences and orientation programs always on how to use assistive technological tools for special students.	136	3.32	1.37	Agree
6.	I have enough skill to work with electronic organizer for special students.	136	3.31	1.21	Agree
7.	I can use spell checkers to support teaching and learning for special students effectively.	136	3.19	1.40	Agree
8.	I am well prepared in using talking computer to support teaching and learning.	136	3.36	1.32	Agree
9.	I am competent to select various assistive technological tools to support teaching and learning.	136	3.47	1.21	Agree
10.	I am well prepared in using magnification software to support teaching and learning.	136	3.26	1.24	Agree
11.	I am capable of determining why, when and how to use technology in education.	136	3.57	1.20	Agree
12.	I can use disk recording for special students effectively.	136	3.65	1.22	Agree
Average Mean			3.39		

Decision mean = 3.0

Table 2 shows the mean and standard deviation of responses on level of self-efficacy of teachers in the use of assistive technological tools in special education primary schools in North Central, Nigeria. The table showed that the average mean for the response was 3.39 with standard deviation of 1.29 which is higher than the decision mean of 3.00. Some of the items include having enough skills to work with braille for special students; enough skill to work with spell checkers for special students; using assistive technological tools for special school students effectively; don't encounter problems using their assistive technological tools for special students and attending training, seminars, workshop, conferences and orientation programs always on how to use assistive technological tools for special students. This implies that teachers in special education primary schools in North-Central, Nigeria have high self-efficacy in the use of assistive technological tools in special education primary schools in North Central, Nigeria.

In order to determine the influence of gender on teachers' response to the facilitating conditions influencing the use of assistive technological tools in special education primary schools in North-Central, Nigeria, mean and standard deviation was used which is reported in Table 3.

Table 3: Mean and Standard Deviation on Influence of Gender on Teachers' Response to the Facilitating Conditions

Gender	N	Mean (\bar{x})	SD
Male	89	41.16	12.807
Female	47	40.72	12.503

Table 3 shows facilitating conditions influencing the use of assistive technological tools in special education primary schools in North-Central, Nigeria. From the above table, it was observed that the mean scores of male teachers was 41.16 with standard deviation of 12.807 while the female teachers had mean scores of 40.72 with standard deviation of 12.503.

In order to find out the level of self-efficacy of teacher's in the use of assistive technological tools in special education primary schools in North-Central, Nigeria, based on gender, mean and standard deviation was used which is reported in Table 4.

Table 4: Mean and Standard Deviation on Influence of Gender on Teachers' Response to the Level of Self-Efficacy of Teacher's in the Use of Assistive Technology Tools

Gender	N	Mean (\bar{x})	SD
Male	89	40.93	11.946
Female	47	40.55	13.166

Table 4 shows self-efficacy of teachers in the use of assistive technological tools in special education primary schools in North-Central, Nigeria, based on gender. From the above table, it was observed that the mean scores of male teachers was 40.93 with standard deviation of 11.946 while the female teachers had mean scores of 40.55 with standard deviation of 13.166.

Testing of Hypotheses

In testing hypothesis one, t-test analysis was used to test the hypothesis which is reported in

Table 5: Summary of t-test Analysis on Perception of Male and Female Teachers' on Facilitating Conditions Influencing the Use of Assistive Technology Tools

Group	N	df	\bar{x}	SD	t-value	P-value
Male	89	134	41.16	12.807	0.527	0.850
Female	47		40.72	12.503		

Table 5 shows summary of t-test analysis of perception of male and female teachers on facilitating conditions influencing the use of assistive technology tools in special education primary schools in North-Central, Nigeria. The t-value was 0.527 the P-value was 0.850 which is $P > 0.05$. This means it was not significant as such hypothesis one was accepted. The mean scores of male teachers was 41.16 with standard deviation of 12.807 while the female teachers had mean scores of 40.72 with standard deviation of 12.503. This implies that there was no significant difference in the perception of male and female teachers on facilitating conditions influencing the use of assistive technological tools in special education primary schools in North-Central, Nigeria.

In testing hypothesis two, t-test analysis was used to test the hypothesis which is reported in Table 6.

Table 6: Summary of t-test Analysis on the Level of Self-Efficacy of Teachers in the Use of Assistive Technology Tools

Group	N	df	X	SD	t-value	p-value
Male	89	134	40.93	11.946	0.170	0.865
Female	47		40.55	13.166		

Table 6 shows summary of t-test analysis on the level of self-efficacy of teachers in the use of assistive technology tools in special education primary schools in North-Central, Nigeria. The t-value was 0.170 the P-value was 0.865 which is $P > 0.05$. This means it was not significant as such hypothesis two was accepted. The mean scores of male teachers was 40.93 with standard deviation of 11.946 while the female teachers had mean scores of 40.55 with standard deviation of 13.166. This implies that there was no significant difference between male and female teachers' on the self-efficacy level on the use of assistive technological tools in special education primary schools North-Central Nigeria.

Discussion of Findings

Finding revealed that there are facilitating conditions which include spacious and rich classroom environment to facilitate the use of assistive technology tools; accessible school location and pleasant school environment to enhance effective use of assistive technology tools; the school building accommodates technology tools to help the movement of physically challenged students; instructional materials are available as some of the assistive technology tools that create a facilitating condition for teachers use among others for assistive technological tools usage for teaching and learning processes in special education primary schools in North-Central, Nigeria. Finding also showed that there was no significant difference in the perception of male and female teachers on facilitating conditions influencing the use of assistive technological tools in special education primary schools in North-Central, Nigeria. This outcome could be as a result of the fact that quality education cannot be achieved with lack or inadequate facilitating conditions in schools. The facilitating conditions for the use of assistive technological tool in the special education primary schools in North-Central ranges from student familiarity, technical resources available, system compatibility, affordability, accessibility and adaptability among others.

The finding is therefore in agreement with Connor, Snell, Gansneder and Dexter (2010) who investigated factors that are predictive of integrating assistive technology into teaching practices among general and special education teachers of students with severe disabilities and they observed that teacher preparedness was determined to be the primary significant facilitating condition for assistive technology use. In the same vein, the finding is in agreement with However, the finding disagreed with Wairimu, Chomba and Awori (2018) who sought to identify factors that influence the use of Assistive Technology in teaching Mathematics to learners in special education primary schools and discovered that the major factors influencing use of assistive technology devices included: inadequate time for syllabus coverage, high cost of assistive technology devices, inadequate teacher training in the use of assistive technology devices, rigid curriculum and negative attitudes of learners.

It was found out that teachers in special education primary schools in North-Central, Nigeria have high self-efficacy in the use of assistive technological tools in special education primary schools in North Central, Nigeria. This could be attributed to the fact that teachers' sense of self-efficacy is a strong predictor of their disposition and personal decision to stay in the profession. This is because the extent of teachers' self-efficacy (multi-dimensional) is related to teaching and learning practices among others which have influence on student learning,

teaching task accomplishment with the aim of establishing structured, supportive and cognitive demanding classroom environment despite the problems that may exist therein among the students. The above finding however does not agree with the finding of Badie (2016) who carried out a study on the relationship between teacher's self-efficacy, attitudes towards information communication technology (ICT) usefulness and student's science performance in the Lebanese inclusive schools and there was identification of possible influences on self-efficacy beliefs, perceived usefulness of computer technology, and ratings of self-efficacy beliefs toward technology integration. Findings of this study revealed that teacher's self-efficacy in the level of technology use, and attitudes have significant effects on the grades and interaction of students with special needs.

This implies that there was no significant difference between male and female teachers' on their self-efficacy level in the use of assistive technological tools in special education primary schools North Central Nigeria. The finding is in agreement with The finding is also in agreement with Ogirima, Ohawuiro and Oyeniran (2017) who examined teachers' attitude and competence in the use of assistive technologies in special needs schools and discovered that teachers have a positive attitude towards the use of assistive technologies. However, teachers were not competent in the use of assistive technologies. Gender and teaching experience did not influence teachers' attitude and competence in the use of assistive technologies.

But the finding disagrees with the finding of Timothy (2009) who examined the relationship between self-efficacy and intended uses of technology. Overall, the results of this study offer some evidence that student teachers' self-efficacy is a significant influence on whether they use technology in a traditionalist or constructivist way. In the same vein, the finding is in disagreement with the finding of Chapez, Beltran, Guerrero, Enriquez and Reyes (2014) who carried out a study on gender on college students' academic self-efficacy and observed that male had higher self-efficacy than female. Likewise, this is a disagreement with the finding of Fallan and Osptad (2016) who carried out a study on the level of self-efficacy and its strength for male and female in a principle of economics course and it was discovered that male students have significantly high self-efficacy level and self-efficacy strength compared to their female peers.

Conclusion

Based on the findings of the study, it can be concluded that there are facilitating conditions which include spacious and rich classroom environment to facilitate the use of assistive technology tools; accessible school location and pleasant school environment to enhance effective use of assistive technology tools; the school building accommodates technology tools to help the movement of physically challenged students; instructional materials are available as some of the assistive technology tools that create a facilitating condition for teachers use among others are available for assistive technological tools usage for teaching and learning processes in special education primary schools in North-Central, Nigeria. It can also be concluded that teachers in special education primary schools in North-Central, Nigeria have high self-efficacy in the use of assistive technology tools in special education primary schools in North Central, Nigeria.

Recommendations

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

- (i) There should be proper emphasis on the availability of facilitating condition for effective and efficient use of assistive technological tools. The Nigerian Government, at all levels, should provide assistive technology tools in schools and ensure proper monitoring of the usage, special education teachers should be sensitized on the potentials of assistive ICTs.

- (ii) Teachers should put their skills into use to enhance teaching and learning processes in special schools in order to help the students learn better.

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