



Evaluation of Information and Communication Technology Facilities Utilization in Teaching of Vocational Subjects at Senior Secondary Schools in Kano State, Nigeria

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ABSTRACT

The study examined the availability, adequacy, functionality, utilization and management of ICT facilities in teaching of Vocational and Technical Education subjects in Kano State Senior Secondary Schools. The study adopted survey research design with 30 Senior Secondary Schools purposively selected from the three senatorial district of Kano State. Teachers of Vocational subjects formed the respondents with a sample of 320. The instrument used to elicit information from the respondents was questionnaire developed by the researchers. The instrument was developed in line with five point rating scale with a mean of 3.00. This instrument was validated and reliability of 0.86 established after a pilot study. The mean responses on the items were subjected to one way Analysis of Variance at 0.05 level of significance. The result shows that there is no significant difference on the level of availability but on adequacy, functionality, utilization and management there were significant differences. It was recommended among others that State government through Ministry of Education should provide the required ICT facilities for all secondary schools and public/private partnership should be mobilised for funding ICT facilities in the state.

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INTRODUCTION

Education remains the only tools for advancement and development in any economy world over. This is evidence in the rating of world power in committee of nations hence the classification into developed, developing and underdeveloped countries. The developed countries have more standardized and robust educational system than those classified as either developing or underdeveloped countries. Effective learning according to Okereke, Garba and Dauda (2020) depends on the quality of teaching, instructional materials available and information and communication technology facility available to them in the school.

Information and communication technology has changed the way we do things in all sphere of life. It has become an important part of most educational organizations all over the world. (Ikwuka, 2013). He went further saying it provides productive teaching and learning in order to increase learners' creative and intellectual resources. The introduction of Information and Communication Technology (ICT) into education is bringing another dimension into educational system. The so call developing and underdeveloped countries are seriously lacking behind in the use of ICT.

Meanwhile ICT are special instructional materials whose impact on

teaching and learning cannot be overemphasized. Information and Communication Technology according to Jones (2010) are hardware, software, networks and media for the collection, storage, processing, transmission and preservation of information as well as related services. They are described as any technology that helps to produce, manipulate and or disseminate information (Wertlen, 2014). ICT in education has the potential to transform teaching and learning among students at all levels of education. It helps students to understand and stimulate them to think out of the box by improving their intellectual curiosity. Information and Communication Technology enhanced learning and played a crucial role in the development of a lifelong learning culture and has the capacity to empower learners by providing them with multiple pathways that offer choice and channels to meet their education and training needs (Minna-Eyovwunu, Akarue, and Obavwunuta, 2019). Technology also provides greater flexibility to adopt teaching and learning to meet learner's cognitive and learning styles

Use of ICT according to Apagu and Wakili (2015) will also simplify abstract concepts through relevant examples by using internet facilities. It is evident that we live in a time of rapid technological change which modernized every aspect of our lives; be it social, physical or intellectual. These technological changes also affected the way we teach and learn. Considering the role of education in the national building and the population explosion in schools today, the use of ICT in the teaching and learning process becomes imperative. This is because its adoption by teachers will enhance effective teaching and learning by both teachers and their students. Issues like effective classroom management, self-study collaborative learning, and effective communication between the participants of teaching-learning process will be enhanced by the

use of ICT based technology. Teaching and learning has gone beyond the teacher standing in front of a group of pupils and giving instruction to them without the students' adequate participation (Apagu and Wakili, 2015). All the above mentioned virtues of ICT did not exempt Vocational and Technical Education as an aspect of education at all levels hence the need to verify its usage at secondary schools in Kano State.

Vocational and Technical Education (VTE) according to UNESCO (2002). International standard classification of education definition, is education and training to "acquire the practical skills, know-how and understanding necessary for employment in a particular occupation, trade or group of occupations or trades. VTE subjects at Senior Secondary School Level in Nigeria include Agricultural Science, Business Studies (such as Principles of Accounting, Commerce, Typewriting, etc.), Fine and Applied Arts, Home Economics (such as Food and Nutrition, Home Management, Garment Making, etc.) and Technical Education (such as Wood Work, Metal Work, Electrical/Electronics, Plumbing, Building, etc.). The teaching of these subjects at secondary schools with ICT facilities will boost the interest of the pupils in their choice of these subjects as a career in the future. Federal Republic of Nigeria [FRN], (2013) also emphasized the use of ICTs at all levels of Nigerian education in which VTE institution are inclusive. The policy statements are:

- i) All States, teachers' resource centres, university, institutes of education, and other professional bodies in education shall belong to the network of ICT.
- ii) Government shall provide facilities and necessary infrastructure for the promotion of ICT and its use as learning tools at all levels of education.
- iii) Virtual library project, aimed at the rejuvenation of the Nigerian schools through provision of easy access to

current books, journals and other information sources using digital technology was also included.

However, these policy objectives were yet to be realized. The New Partnership for African Development (NEPAD) launched the e-schools, initiative, intended to equip all African high schools with ICT equipment. It is meant to connect African students to the internet and to impart ICT skills to young Africans in the primary, secondary and tertiary institutions, to harness ICT to improve, enrich, and expand education in African countries (Aginam, 2006). According to Ajayi (2008), the effective utilization of ICT in teaching and learning depends on the availability of these facilities and teachers competence in using them. Observation of the researchers have shown that there are no functional ICT facilities in most secondary schools in Kano State and this hampers the teacher ability to use them for teaching and learning. Also lack of adequate ICT facilities, technical know-how, irregular power supply and inadequate funding are another set of obstacle militating against effective utilization of ICT facilities in teaching and learning of Vocational and Technical Education subjects at this level of education in Kano State schools. The above problems necessitated the quest of the researchers to evaluate ICT facilities utilization in teaching of VTE subjects in public Senior Secondary Schools in Kano State.

Objectives of the Study

1. Establish level of availability of ICT facilities in teaching of Vocational subjects at SSS within Kano State of Nigeria
2. Establish level of adequacy of ICT facilities in teaching of Vocational subjects at SSS within the study area
3. Establish level of utilization of ICT facilities in teaching of Vocational subjects at SSS within the study area

4. Determine level of functionality of ICT facilities in teaching of Vocational subjects at SSS within the study area
5. Establish level of management of ICT facilities in teaching of Vocational subjects at SSS within the study area

Hypotheses of the Study

1. There are no significant differences in the availability of ICT facilities for teaching of Vocational subjects at Senior Secondary School within Kano State of Nigeria.
2. There are no significant differences in the adequacy of ICT facilities for teaching of Vocational subjects at Senior Secondary School within the study area.
3. There are no significant differences in the utilization of ICT facilities for teaching of Vocational subjects at Senior Secondary School within the study area.
4. There are no significant differences in the functionality of ICT facilities for teaching of Vocational subjects at Senior Secondary School within the study area.
5. There are no significant differences in the management of ICT facilities for teaching of Vocational subjects at Senior Secondary School within the study area.

METHODOLOGY

Survey research design was adopted for the study because of its suitability in covering large group. This study was carried out in Kano State of Nigeria. The state three senatorial districts formed the basis for selecting respondents who are staff of Senior Secondary Schools. Schools that offer at least three vocational subjects were selected for the study. 30 secondary schools were selected purposively and all vocational subject teachers in the schools formed the targeted respondents which amounted to 132 staff. The respondents comprised of teachers of Agricultural Science (30), Business Studies (41), Fine

and Applied Arts (25), Home Economics (24) and Technical Education (12).

The instrument used for data collection was questionnaire tagged Information and Communication Technology Teaching Facilities Questionnaire (ICTTFQ). The instrument was developed by the researchers and was validated by three experts in Vocational and Technical Education with two from Federal College of Education, Zaria and one from Kaduna Polytechnic, Kaduna. The instrument was also pilot tested in Zamfara State (a state within the same geopolitical zone) with 20 respondents. The data collected was subjected to split half reliability tool and Pearson Product Moment Correlation (PPMC) that gave 0.86 reliability. However, the instrument was divided into six sections; section A-F with A dwelling on bio-data of the respondents, B to F on availability, adequacy, utilization, functionality and management respectively. The section B to F were design in line with five point rating scale of Strongly Agreed (SA = 5), Agreed (A = 4), Undecided (U = 3), Disagreed (D = 2) and Strongly Disagreed (SD = 1) for Sections B, E and F while Highly Adequate

(HA = 5), Adequate (A = 4), Moderately Adequate (MA = 3), Not Adequate (NA = 2) and Highly Not Adequate (HNA = 1) for section C and Highly Utilized (HU = 5), Utilized (U = 4), Moderately Utilized (MU = 3), Not Utilized (NU = 2) and Highly Not Utilized (HNU = 1) for section D.

The Instrument was administered by the researchers by distributing in the first week and coming back for collection in the third week. A total of 132 questionnaire was distributed while 120 were recovered having 90.90% rate of recovery. The mean of each items were calculated with a mean of 3.00 as acceptable benchmark while the means were subjected to analysis using one way Analysis of Variance (ANOVA) at 5% level of significance. All significant differences observed were further subjected to Tukey HSD.

Result and DISCUSSION

The results were presented based on the hypotheses stated;

Hypothesis One: There are no significant differences in the availability of ICT facilities for teaching of Vocational subjects at Senior Secondary School within Kano State of Nigeria.

Table 1: Analysis of Variance on Availability of ICT Facilities

Treatment	Sum of Square	Df	Mean Square	F	Sig.
Between	3.799	4	0.950	2.195	0.079
Within	28.124	65	0.433		
Total	31.923	69			

The mean scores of availability of ICT facilities for teaching the VTE subjects at SSS in Kano State stood at 2.471, 2.446, 2.702, 2.404 and 1.987 for Agricultural Science, Business Studies, Fine Art, Home Economics and Technical Education respectively. These means indicated that the 14 items were lower than the benchmark, hence rated as not available. The result on Table 1 shows F ratio of 2.195 with P value of 0.079 on degree of freedom 4, 65 on means of the items. That is $F(4, 65) 2.195 P0.079 > 0.05$ hence there are no significant differences on the

level of availability of ICT facilities among the subjects within the state. The finding of this study corroborated the stand of Okwudishu (2015) who discovered unavailability of some ICT components among village secondary schools in Aniocha Local Government Area of Delta State. This finding is also in agreement with Onwuagboke, Singh and Onwuagboke, (2014) that the extent of availability of ICT resources in secondary schools for teaching and learning was very poor in South Eastern Nigeria

Hypothesis Two: There are no significant differences in the adequacy of ICT facilities for teaching of Vocational

subjects at Senior Secondary School within the study area.

Table 2: Analysis of Variance on Adequacy of ICT Facilities

Treatment	Sum of Square	Df	Mean Square	F	Sig.
Between	4.633	4	1.158	6.735	0.000
Within	9.458	55	0.172		
Total	14.091	59			

The mean scores of the five subjects stood at 2.1375, 2.2575, 2.3758, 1.7775 and 1.6558 for Agricultural Science, Business Studies, Fine Art, Home Economics and Technical Education respectively. This indicates that none of the subjects meet the benchmark of 3.00, hence were all rated as inadequate. However the result on Table 2 shows F ratio of 6.735 with P value of 0.000 on degree of freedom 4, 55 on means of the 14 items tested. That is $F(4, 55) 6.755$ $P(0.000 < 0.05)$ hence there are significant differences on the level of adequacy of ICT facilities among the subjects within the state. The result is in agreement with Plante and Beattie (2004) who concluded inadequacy of ICT accessories in

integrating technologies in Nigeria education. Also, the finding agreed with Wilma and Lawler (2017) who discovered inadequacy number of computer and peripheral devices inhibiting deployment of ICT by teachers in Kenya. The result was further supported by Belay, Khatete and Mugo (2020) who concluded that most of the secondary schools had inadequate ICT facilities in Southern Region of Eritrea.

Hypothesis Three: There are no significant differences in the utilization of ICT facilities for teaching of Vocational subjects at Senior Secondary School within the study area.

Table 3: Analysis of Variance on Functionality of ICT Facilities

Treatment	Sum of Square	Df	Mean Square	F	Sig.
Between	2.851	4	0.713	3.455	0.014
Within	11.347	55	0.206		
Total	14.198	59			

The mean scores of the five subjects stood at 2.3250, 2.3542, 2.610, 2.3333 and 1.9300 for Agricultural Science, Business Studies, Fine Art, Home Economics and Technical Education respectively. This indicates that none of the subjects meet the benchmark of 3.00, hence were all rated as not functional. However the result on Table 3 shows F ratio of 3.455 with P value of 0.014 on degree of freedom 4, 55 on means of the items. That is $F(4,55) 3.455$ $P(0.014 < 0.05)$ hence there are significant differences on the level of functionality of ICT facilities among the subjects within the state. The

result disagreed with Ademiluyi (2019) whose observation and anecdotal inferences suggested that there are, at best, few functional ICT facilities in public secondary schools in Osun State. On the contrary, Ajayi (2008) claimed there are no functional ICT facilities in public secondary schools.

Hypothesis Four: There are no significant differences in the functionality of ICT facilities for teaching of Vocational subjects at Senior Secondary School within the study area.

Table 4: Analysis of Variance on Utilization of ICT Facilities

Treatment	Sum of Square	Df	Mean Square	F	Sig.
Between	7.739	4	1.935	4.773	0.002
Within	26.348	65	0.405		
Total	34.087	69			

The mean scores of the five subjects stood at 2.5564, 2.4829, 2.8343, 2.1886 and 1.8621 for Agricultural Science, Business Studies, Fine Art, Home Economics and Technical Education respectively. This indicates that none of the subjects meet the benchmark of 3.00, hence was all rated as not utilized. The result on Table 4 shows F ratio of 4.773 with P value of 0.002 on degree of freedom 4, 65 on means of the items. That is $F(4,65) 4.773 0.002P < 0.05$ hence there are significant differences on the level of utilization of ICT facilities among the subjects within the state. The result is in agreement with the study conducted

by Mavellan, Wellington and Samuel (2015) which revealed that the available ICT resources were utilized by teachers to a very low extent in Kwekwe Zimbabwe. Also Onwuagboke, Singh and Onwuagboke, (2014) concluded that the extent of utilization of ICT resources in secondary schools for teaching and learning was below average in South Eastern Nigeria.

Hypothesis Five: There are no significant differences in the management of ICT facilities for teaching of Vocational subjects at Senior Secondary School within the study area.

Table 5: Analysis of Variance on Management of ICT Facilities

Treatment	Sum of Square	Df	Mean Square	F	Sig.
Between	5.886	4	1.471	10.232	0.000
Within	4.314	30	0.144		
Total	10.200	34			

The mean scores of the five subjects stood at 3.5729, 3.2643, 3.9743, 3.8086 and 2.8214 for Agricultural Science, Business Studies, Fine Art, Home Economics and Technical Education respectively. This indicates that all the subjects meet the benchmark of 3.00 except Technical Education, hence they all agreed to the management items with only Technical Education disagreeing with the items. The result on Table 5 shows F ratio of 10.232 with P value of 0.000 on degree of freedom 4, 30 on means of the 7 items. That is $F(4,30) 10.232 P0.000 < 0.05$ hence there are significant differences on the level of management of ICT facilities received among the subjects within the state. The findings of this study were corroborated by Khan, Hassan and Clement (2012) who observed support of administrative will power towards ICT in Bangladesh. On the

contrary the result disagreed with Mamun and Tapan (2009) who concluded that corruption has been identified as one of the strong barriers to the implementation of ICT in education.

CONCLUSION

Based on the findings of this study on availability, adequacy, utilization functionality and management of information and communication technology facilities in teaching of Vocational and Technical Education subjects in Senior Secondary Schools in Kano, it is concluded that ICT facilities are grossly inadequate hence not being utilized in teaching at this level of education.

RECOMMENDATIONS

The following recommendations were proffered to correct the lapses



observed in ICT facilities utilization in teaching of Vocational and Technical Education in Kano State Senior Secondary Schools;

1. State government through Ministry of Education (MOE) should supply ICT facilities required to the school in the state.
2. Training of teachers by MOE through organized workshops in collaboration with Ministry of Science and Technology on handling and usage of ICT facilities.
3. Electrification of public secondary schools especially those outside the urban centres by State government to facilitate ICT facilities usage.
4. Public private partnership should be encouraged by the state government towards funding of ICT facilities in all secondary schools in the state.
5. Machinery should be put in place to supervise usage and maintenance of the facilities to discourage wastage and abandoning the facilities in store after supply.

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