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Availability, Gender and Teaching Experience: Determinants of ICT Utilization in Teaching in Rural Secondary Schools in South Eastern Nigeria

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Abstract:
This paper is a survey which was designed to ascertain the various Information and Communication Technology resources available for teaching and learning in secondary schools in Mbaise, Imo State Nigeria. The study is a descriptive survey. The population of the study is made up of all the secondary school teachers in all the forty Secondary Schools in Mbaise. A sample size of 264 respondents was selected for the study using stratified - random sampling technique. The instrument used for the collection of data was a set of researcher–made questionnaire. Data collected was analyzed using frequency counts and simple percentages, independent sample t-test and one-way analysis of variance (ANOVA). Result shows that the extent of availability of ICT resources in secondary schools in Mbaise is very low. The extent of utilization of ICT resources in teaching and learning is equally very low with male teachers having higher utilization mean scores than the female teachers. The mean difference between the male and female teacher was found to be statistically significant. There was however no significant difference in ICT utilization means score between teachers based on teaching experience. It was concluded that much need to be done by government in the area of provision of ICT resources for teaching and learning in this era of ICT-based learning. The paper recommends governments', non-governmental organizations' and private individuals' intervention in the provision of needed ICT resources in the schools among others.

Key words: Availability;ICT resources; Learning; Secondary Schools;Teaching;Utilization. Nigeria

1. Introduction

Information and communications technology is as old as man. This is informed by the fact that man since creation has continually created ways and means of communicating with his fellow man. The development of gadgets which handle and transfer information in ways that marvels and was unthought-of in the history of man is as a result of man's quest to create better ways of handling information. The principal stock in trade of education is the transmission or transfer of information from the teacher to the learner. If there is any technological development that has a very great potential for development in education and can improve education quality, expand learning opportunities and make education accessible, it is the development in ICT. Information and communication technology according to Ochoyi and Ukwumonu (2008) has the capacity to produce higher interactive potentials for users to develop individual intellectual and creative ability.

It is as a result of the great advantages which ICT offers that Nigerian educational reforms stressed the importance of computer technology in Schools during the 32nd ministerial council meeting of the National Council on Education in 1987 (FRN,2004). The role of ICT in the advancement of knowledge and skills necessary for the effective functioning of an individual in the modern world is further stressed in the National policy on education. In the bid to integrate ICT into education in Nigeria for effective teaching and learning to take place, internet services in schools tagged school Net Nigeria was launched in September 2001. Thirteen years after the launch, one would expect to see the impact felt in all the secondary schools in Nigeria. Computers are supposed to be provided by the government in all schools whether in urban or rural areas as part of her responsibility in funding and running of schools. These computers are to be connected to the internet for the use of teachers and students in learning.

Information and communication technology are information handling tools that are capable of being used to generate process, store and retrieve, distribute and exchange information. When these different tools work together, they combine to form a network which reaches any part of the globe. It has increasingly become the most powerful tool for participating in virtually every global activity such as global market, promoting political accountability, improving the delivery of basic services and enhancing local development opportunities (UNDP 2006). When ICT is mentioned, computer and internet connection are what readily comes to mind. These two are not the only components of ICT but have actually revolutionized the way we handle and disseminate

information. However they are electronically based system of information transmission, reception, processing and retrieval which has drastically changed the way we think, the way we live and the environment in which we live (Ogunsola, 2005). ICT resources capable of being used in teaching and learning include but are not limited to the following; radio, radio-cassette recorders, televisions, computer, multi-media projectors, fax machines, optic fibers, CD- Rom, internet, electronic notice boards, interactive white boards, slides and slide projectors, overhead projectors, video players and VCDs etc.

2. The Need for ICT Utilization in Teaching and Learning in Secondary Schools

An ICT driven learning environment is important for the Nigerian child. Over the years what dominated the classroom in Nigeria was principally the chalkboard and textbooks. Although radio/television and film have been used for educational purposes in many countries of the world, they have not been common features in the Nigerian classroom. In the areas where they were used, none has impacted on the educational process as the computer. While television and films appeal to the audio-visual faculties of users, the computer is capable of activating the sense of sight, hearing and touch of the user. It has the capacity to provide higher interactive potentials for users to develop their individual intellectual and creative ability.

According to Shavinina (2001) the bottom line of ICT entails just in the enhancement of human mental resources allowing individuals to equally apply effectively the present knowledge and create new ones. In a global economy that is ICT propelled, virtually every human activity is computer centered, application for jobs, admissions, checking of results, teaching and learning, buying and selling and even banking are now done online, the Nigerian student should be acquainted with ICTs to enable him cope with present day living in the society after school. Apple Computer (2002) posits that students who use ICTs gain deeper comprehension of multifaceted topics and ideas and are more likely to recall facts and use it to resolve challenging situations outside the classroom. Most employers of labor today make the acquisition of ICT skills as a prerequisite for employment in their establishments.

In the present dispensation, a number of establishments, institutions and organizations find it appropriate to train and retrain their personnel to gain or develop on their ICT knowledge and utilization of ICT facilities (Adomi&Anie, 2006). It therefore becomes necessary to introduce them to the basic ICT skills early to enable them eternalize and use them for especially in the secondary school where ICT is supposed to be used to ensure the upbringing of the youth who will contribute to actualizing Nigeria's dream of being among the committee of technologically advanced nations of the world by the year 2020. The use of ICTs in secondary school may definitely improve Nigerian education system there by giving students a better education that can enable them to compete favorably with products of other education systems all over the world, leading to the creation of a technologically advanced work force with the potential to improve military technology, telecommunication, media communication and skilled ICT professionals who will be well-equipped to solve ICT related problems where ever they find themselves (Goshit, 2006). Integration of ICT in teaching at this level invariably will give rise to new instructional techniques. This makes the students to engage themselves in individualized learning.

3. Empirical Studies on Availability of ICT

Some studies have tried to investigate the availability and use of ICT resources for teaching in secondary schools (Ezeoba, 2007; Fakeye, 2010; Idoko&Adamu, 2010) in Nigeria. These studies reveal a general lack of ICT resources in the schools leading to limited use of same in instruction. These investigations were carried out in secondary schools outside Imo State. It appears that there is a paucity of research on availability and use of ICT in Imo state. The only related investigation carried out in the state is that of Mbagwu and Opara (2011) which investigated teachers' use of ICT in teaching and learning in Owerri municipal council. Findings from the research also show very low level of ICT resource availability. In all these studies, none was conducted in the local government areas in Mbaise hence the researchers set out to see the extent to which ICT resources are available and utilized for effective instructional delivery in secondary schools in local government areas in Mbaise.

4. Studies on Gender, Teaching Experience and ICT use

Researchers have also investigated the effect of gender and teaching experience on ICT utilization by teachers. These researches have reported mixed findings on gender effect on ICT use in teaching. For example while Tezci (2009; Cooper, 2006), report that gender plays a role in teachers' use of ICT in teaching, however Rahimi and Yadollahi (2010) report no relationship between ICT use and gender. On the other hand teaching experience has not been widely investigated in relation to ICT use by teachers. Findings on relationship between teaching experience and ICT use show that teacher' years of teaching experience relate to ICT use in teaching (Tezci, 2009; Rahimi&Yadollahi, 2010; National Centre for Educational Statistics, 2006). This implies that the higher the teachers experience on the job, the lesser the use of ICT in teaching.Niederhauser and Stoddart (2001) however found no difference between highly experienced and less experienced teachers in the use of ICT in the learning environment. With these mixed reports on these two teacher characteristics on ICT utilization, investigating further in secondary schools rural schools in Mbaise South Eastern Nigeria is an added impetus to the on-going discourse.

5. Statement of the problem

The Federal Government of Nigeria in the National Policy on Education (FRN, 2004) is mindful of the importance of information and communication technology in the world of today that is ICT driven hence its integration in the school curriculum at all levels of education in the country. The document states that government will provide the necessary ICT infrastructure and training needed in the secondary schools. Observation of the researchers during teaching practice supervision has shown that ICT resources are not used by the pre-service teachers in their teaching practice. The question then arises whether these resources are available in the secondary schools and not made accessible to the pre-service teachers for use in instruction. It is worthy of note that the propensity to use ICTs in teaching and learning activities is highly determined by the availability of these resources in the

schools. Successful application of technology in schools is largely dependent upon the availability and accessibility of ICT resources such as hardware, software and communications infrastructure (Hennessy et al. 2010).   The case of secondary schools in Mbaise may not be different.

The effect of gender on ICT utilization has not been fully investigated in the Nigerian school context. As it is common sight in schools these days that females out number males in the teaching profession, it then becomes pertinent that gender effect on ICT utilization by teachers be examined. The Federal Republic of Nigeria has this lofty government policy on IT formulated in 2001 which places premium on provision and use of ICT at all levels of education (FRN, 2001). Most government policies die naturally because of lack of assessment of its implementation. In a state that has education as its' biggest industry offering free education at all levels it is a worthwhile enterprise to ascertain how school ICT policy has been implemented. Now that the Joint Admission and Matriculations Board (JAMB) intends to fully implement Computer Based Test (CBT) in its Unified Tertiary Matriculation Examination (UTME) to place Nigerian education at par with global best practice by 2015, (Channels Television, 2012; NAN, 2014) it is imperative to investigate the availability of requisite ICTs for students learning and adequate preparation for this examination. The study therefore seeks to establish the level of availability of ICT resources, their utilization in the teaching and learning situation.

6. Purpose of Study
The purpose of this study was to find out the available ICT resources in secondary schools in Mbaise with a view of ascertaining:
- the level of availability of these resources,
- the of utilization of these ICT resources by teachers according to gender and teaching experience.

7. Research Questions:
The following research questions were asked in order to direct the study:
- Are the required Information and Communications Technology resources available in Secondary Schools in Mbaise?
- Is there any difference in resource utilization in teaching and learning between male and female teachers in Mbaise?
- Is there any difference in resource utilization in teaching and learning among teachers based on teaching qualification?

8. Materials and Methods
The descriptive survey research design was adopted for this study. The population for the study consisted of all the teachers of Secondary Schools in the three local government areas in Mbaise. A sample size of 264 teachers was randomly selected from the 1,025 teachers in the Secondary Schools in Mbaise. A researcher-designed set of questionnaire on ICT availability (ICTA) and ICT utilization (ICTUS) was used to collect data for the study. The questionnaire was validated by the researcher's colleagues in ICT, Educational technology and Measurement and Evaluation in AlvanIkoku Federal college of Education Owerri. The Cronbach's Alpha was used to determine the reliability of the instrument. The reliability coefficient of the (ICTUS) instruments was 0.85.

The researchers personally administered the questionnaire to the respondents and collected them on the spot. Personal contacts were used as a follow up to ensure high rate of return. In all 224 questionnaires were returned giving a return rate of 84.85%, and was used for the data analysis. Data was collated and analyzed using frequency counts and percentages. The independent T-test and one-way ANOVA was employed to answer research question two and three respectively.

The respondent is made up of 143 female teachers representing 63.8 percent and 81 male teachers representing 36.2 percent of the sample as shown in table 1.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	81	36.2	36.2	36.2
	Female	143	63.8	63.8	100.0
	Total	224	100.0	100.0	

Table 1: Gender of respondents

In terms of teaching experience the, 36.6% have teaching experience of between 7-12 years which the group with the greatest membership as shown in table 2 below.

Teaching Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 - 6 Years	67	29.9	29.9	29.9
	7 - 12 Years	82	36.6	36.6	66.5
	13 - 19 Years	54	24.1	24.1	90.6
	20 Years and Above	21	9.4	9.4	100.0
	Total	224	100.0	100.0	

Table 2: Teaching Experience of Respondents

9. Results and Discussions

The results of the study are presented and discussed below. The presentation is organized according to the research questions and hypotheses.

9.1. Research Question 1

Are the required Information and Communications Technology resources available in Secondary Schools in Mbaise?

Data presented in table1 shows that five out of the eighteen listed ICT resources were not available in any of the secondary schools as they received zero positive response. Only telephone is the ICT resource that received a positive response amounting to 84.38% that is high, followed by radio tape recorder (44.20%), photocopying machine (27.23%) and desktop computers (25%). The rest received positive responses under 20%. The findings reflect a very low level of availability of ICT resources in the schools in the area. The telephone was highly available as almost every teacher in the schools has a personal mobile phone. It is not as if there was provision for such by school management for instruction. The same is true of radio tape recorder.

S/n	Item	No.	Available	%	Not available	%
1	Desktop computer	224	56	25	168	75
2	Laptop	224	4	1.79	220	98.21
3	Television	224	12	5.36	212	94.64
4	Video player	224	9	4.02	215	95.98
5	Radio(Tape recorder)	224	99	44.20	125	55.80
6	Digital camera	224	0	0.00	224	100
7	Printer	224	39	17.41	185	82.59
8	Multimedia projector	224	3	1.34	221	98.66
9	Projector screen	224	3	1.34	221	98.66
10	Scanner	224	23	6.25	201	93.75
11	Photocopying Machine	224	61	27.23	163	72.77
12	Satellite disc	224	0	0.00	224	100
13	Fax Machine	224	0	0.00	224	100
14	Computer accessories	224	40	17.86	184	82.14
15	Internet facilities	224	7	3.12	217	96.88
16	Interactive White Board	224	0	0.00	224	100
17	Electronic Notice Board	224	0	0.00	224	100
18	Telephone	224	189	84.38	35	15.62

Table 3: Availability of ICT resources insecondary schools

This finding is consistent with Mbagwu and Opara (2011), Ezeoba (2007) and Fakeye (2010) who discovered very low level ofavailability of ICT resources in secondary schools. Okwudishu (2005) found out that absence of some ICT components in the schools has hampered teachers' use of ICTs. The teachers and the students can only make use the facilities if they are available in their school. The scarcity of ICT resources in these rural schools implies that the teachers and the students in these schools will lack access to electronic educational resources affordance of ICT. This has a far reaching implication on the attainment of the millennium development goals that requires the use of ICT to achieve education for all as well as for lifelong learning. Meeting with the requirement of computer based test (CBT) for the JAMB 2015 Unified Tertiary Matriculation Examination (UTME) may be an uphill task for the students from these rural schools.

9.2. Research Question 2

Is there any significant difference in ICT resources utilization in teaching and learning between male and female teachers?

To determine if there is significant difference in mean scores of male and female teachers involved in the study, an independent-samples t-test was conducted to compare the ICT utilization scores for male and female teachers. The result of the investigation is as presented in table 4 below. There was a significant difference in scores for males (M = 21.51, SD = 4.86) and females (M = 17.04, SD = 4.34; t (222) = 7.08, p = -.02, two-tailed).

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
									Lower	Upper	
Teachers' ICT Utilization	Equal variances assumed	3.147	.077	7.082	222	.000	4.46421	.63040	3.22189	5.70654	
	Equal variances not assumed			6.862	151.123	.000	4.46421	.65060	3.17877	5.74966	

Table 4: Independent Sample t-test

The magnitude of the differences in the means (mean difference = 4.464, 95% CI: 3.22189 to 5.70654) was large (eta squared = .184).This is consistent with (Tezci, 2009; Cooper, 2006) who found differences in ICT usage between male and female teachers in favor of the male teachers. This finding however contradicts Rahimi and Yadollahi (2010) who found no difference in ICT use based on gender. This result raises a major concern for awareness creation as well as concerted efforts to be made to get female teachers in the rural communities to use ICT in their teaching. This is very necessary in view of their population in comparison to their male counterparts.

9.3. Research Question 3
Is there any difference in resource utilization in teaching and learning among teachers based on teaching experience?
To answer this research question a one-way analysis of variance (ANOVA) was conducted to ascertain if teachers' ICT utilization varies according to teaching qualification of the teacher. The assumption for homogeneity of variance was tested using the Levene's test of homogeneity. The test result of the Levene's test analysis is presented in table 3 below.

Levene Statistic	df1	df2	Sig.
.252	3	220	.860

Table 5: Levene's Test of Homogeneity of Variance

The significant value indicated in the Levene's statistics table shown above is greater than .05, (which means not significant); an indication of the fact that the assumption of homogeneity of variance was not violated. Therefore a one-way between-groups analysis of variance was conducted to explore the impact of teachers' teaching experience on levels of ICT utilization as measured by the ICT Utilization Scale (ICTUS).
The respondents were divided into four groups according to their teaching experience (Group1: 0- 6years; Group 2:7- 12 years; Group 3: 13- 19 years; Group 4:20 years and above). From the descriptive statistic generated, group 1 which is the least experienced of the research groups have the highest mean score of 19.582 with standard deviation of 4.973 followed by group 4, group 2 and finally group 3 as shown in table 6.

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0 - 6 Years	67	19.5821	4.97311	.60756	18.3691	20.7951	9.00	31.00
7 - 12 Years	82	18.3171	4.97122	.54898	17.2248	19.4094	10.00	32.00
13 - 19 Years	54	18.0926	5.17348	.70402	16.6805	19.5047	8.00	30.00
20 Years +	21	18.4762	4.77094	1.04111	16.3045	20.6479	10.00	28.00
Total	224	18.6563	5.00786	.33460	17.9969	19.3156	8.00	32.00

Table 6: Descriptive statistics of Teachers' ICT utilization

The analysis of variance conducted for the four groups is as shown in table 7 below. Though differences exist in the mean score and standard deviation of the groups, the test however did not find the differences statistically significant.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	84.702	3	28.234	1.128	.339
Within Groups	5507.830	220	25.036		
Total	5592.531	223			

Table 7: The Analysis of Variance

Thus we report that there was no statistically significant differenceat the $p < .05$ levelin ICTUS scores for the four groups as a result of years of teaching experience: $F (3, 220) =1.128$, $p = .34$. The findings above are consistent with those of Rahimi and Yadollahi, (2010)and Niederhauser and Stoddart, (2001) who found no relationship between ICT usage and teachers' years of teaching experience.The result is however in contradiction withthose of Tezci (2009) and National Centre for Educational Statistics (2006) who reported that the number of years of teaching experience of a teacher is directly related to ICT usage. In other words the more experienced a teacher is the more he uses ICT in the teaching and learning environment.

10. Recommendations
Based on the findings of this study, the researchers therefore make the following recommendations. The government should increase funding for the entire educational sector with emphasis on ICT in view of the need for the schools to live up to the expectation of producing 21st century learners who are capable of becoming global citizens. This will help improve the level of ICT facilities in the schools. There should also be continuous and periodic training and retraining of teachers on computer and ICT skills acquisition. This will help provide them with practical and functional knowledge needed for their day today interaction with students in the classroom. If this is done, the teachers will be kept abreast of current developments in the utilization of ICT in teaching and learning. Female teachers should be given a greater opportunity for any capacity building workshop on the use of ICT in teaching to help bridge the observed gender imbalance in ICT utilization in view of their population in the schools.

11. Conclusion
The findings of this study have clearly shown that Information and communications Technology resources are not available in the secondary schools in Mbaise. This makes the schools in the area to lag behind in the utilization of ICT resources in teaching-learning setting. The scenario was also responsible for the very poor utilization of ICT resources by the teachers as availability leads to accessibility and usability.There is no doubt that teachers in Mbaise will have numerous amounts of ICT learning resources at their disposal if government lives up to its expectation in the implementation of her ICT policies. Female teachers in the area should brace up to the challenge of utilizing ICT resources in the execution of their duties like their male counterparts by exploring the use of these resources.
In order to fit in to the new technology driven era, Nigerian schools and individuals should as a matter of necessity develop a culture that places high premium on the application of information and communication technology in teaching and learning. That is the only way that they can benefit maximally from the potentials of ICT in learning as well as become acceptable members of the new global learning community.

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