

Perceived Teachers' Awareness and Level of Competencies in Using Information and Communication Technology Facilities

Dr. John Sakiyo, Awumtia Isa Kumba and Kawu waziri

^{1*} Modibbo Adama University of Technology, Yola. (jsakiyo@yahoo.com)

^{2*} College of Education Hong, Adamawa State

^{3*} Modibbo Adama University of Technology, Yola. (kawuwaziri@rocketmail.com)

Abstract

The study investigated the perceived Teachers Awareness and Competencies of Information and Communication Technology Facilities. One research question and two hypotheses guided the study. The design of the study was descriptive survey. The population of the study was all NCE and Graduate secondary school teachers in Adamawa State. Two hundred and forty eight teachers were selected using Krejcie and Morgan's table for determining sample size of a finite population. The instrument for data collection was questionnaire tagged Information and Communication Technology Competencies of Teachers Questionnaire (ICTCTQ) developed by the researchers. The instrument was validated by three academic staff of Science Education Department, Modibbo Adama University of Technology. The instrument was subjected to reliability test using Cronbach alpha, reliability coefficient of 0.89 was obtained. The instrument was administered by the researchers and was analysed using descriptive statistics and Man-witney U-test. The result of the study revealed that teachers have moderate awareness and competency about ICT facilities, the hypotheses revealed that there is no significant difference between NCE and graduate teachers about ICT facilities awareness and competency. Based on the result it was concluded that teachers have moderate level of ICT competencies and are moderately aware about ICT facilities for teaching. It was recommended that, ICT should be fully integrated into the curriculum for further educational developments. Teachers should also be encouraged to attend seminars/workshops as well as refresher courses in ICT.

Keywords: ICT facilities, Teachers, Awareness, Competency

1. Introduction

The Knowledge of Information and Communication Technology (ICT) in the 21st century education system has been described as vital to keeping abreast with the rapid changes in technology. The importance ICT in education has been translated into huge potentials in terms of positive outcomes (Adebayo 2008). Adebayo further stated that there is substantial evidence that ICT promote quality education and effective teaching and learning atmosphere for both students and teachers. ICT has been recognized to be a very powerful tool in educational reforms. It has radically influenced the way knowledge and information are generated, developed and transmitted. ICT has also reduced the entire world into a global village and replaced the use of physical strength in performing task with automation. Teachers, teacher-trainers and educationists who are not familiar with ICT will find themselves threatened by professional obsolescence (Adewoyin, 2009).

Abolade and Yusuf (2005) described information and communication technologies as essential tools in the educational system. ICT have the potentials of meeting the learning needs of individual students, promote equality of educational opportunities, offer high quality learning materials, increased self-efficacy and independence of learning among students. Abolade and Yusuf further stated that, the ICT facilities are employed in education include: radio, television and audio-visuals among others.

The Federal Government of Nigeria fully appreciates the role of ICT in national development. Consequently, it has put in place in the year 2001 a policy document, the National Policy for information Technology. The policy clearly spelt out the ICT vision, mission and policies for Nigeria. Similarly, the National Policy on Education of the Federal Republic of Nigeria (2004) acknowledged the importance of using ICT in improving knowledge, and that government shall provide necessary infrastructure and training for the integration of ICT in advancing knowledge and skills in the modern world. It is assumed that if the federal government policy is implemented, teachers in our school would be made to acquire ICT skills which will help them in effective instructional delivery as well as facilitating teaching and learning.

ICT has been defined in various ways by different scholars. Adebayo (2008) stated that ICTs is a diverse set of technological tools and resources used to communicate, create, disseminate, store and manage information. These technologies include computers, the internet, broadcasting technologies (radio and television) and telephones. Imoko and Usman (2006) stressed that, ICT is concerned with handling, manipulating and presenting information usually through texts, pictures and sounds using computers, tape recorders and robotic devices among others. Imoko (2004) conceptualized ICT as a process of receiving, storing, computing, analysing, transmitting and retrieving information using assorted electronic devices. ICT according to Nwabueze (2005) refers to all the communication gadgets, equipment or facilities which improve/enhance the manner in which messages are stored, relayed, disseminated, preserved and recalled for meaningful communication purposes. ICT technological tools according to Chaka (2008) include computers, internet, broadcasting technologies (radio and television) and telephone. Adewoyin (2009) classified

ICT into three groups namely; (i) those that process information e.g. computer (ii) those that disseminate information e.g. communication i.e. electromagnetic devices and systems and (iii) those for presentation of information e.g. multimedia.

Teaching is an attempt to assist someone to acquire skills, attitudes, ideas, appreciation and change behaviour. The teacher's job therefore is to influence desirable changes in the behaviour of learners through the use of technologies such as video, computer, internet, and radio among others. Learning on the other hand, is a process of gaining knowledge or acquiring skills or having understanding of a new thing. Researches (Abolade and Yusuf 2005, Jegede 2008, and Adebayo 2008) have shown that the quality of teaching and learning can be significantly enhanced when ICT are utilized during instruction. Ojowu and Agbo (2006) recommended that, teachers should make use of information and communication technology to communicate ideas, describe projects and other information.

ICT competencies play an important role in developing a nation. Idowu, Adagunodo and Idowu (2004) pointed out that knowledge and skills of computer technology are assets for those who want to enter into the competitive employment market. Furthermore, with the increasing use of ICT in education all over the world, new skills and competencies among students are necessary for them to learn effectively. Students, who are competent in ICT skills will be able to capture, process, store, and transfer information that will enable them to focus on information content, communication, analysis, searching and evaluation (Dholakia, Dholadia, & Kshetri, 2003). Today, improved communication technology has made time and space less complex. Thus, the ability to acquire, utilize, communicate and retrieve relevant and accurate information has become an important attribute for better teaching-learning process (Adebayo, 2008).

ICT competencies among Nigeria Certificate in Education (NCE) teachers should be seen as a valuable prerequisite that would help facilitate the teaching and learning procedures in this modern age. ICT Competency Framework for Teachers stated by UNESCO (2011) can improve access to and promote equity in education by providing educational opportunities to a greater number of people of all ages, including those in rural and remote areas, women and girls and persons with disabilities (Unwin, 2004).

In Nigeria, teacher education is provided in Colleges of Education and Faculties of Education in Universities and National Teachers Institutes (NTI). Nigerian teacher education institutions recognize the usefulness of the ICT in the contemporary world, hence the inclusion of ICT components in teacher education programmes in Nigeria (Federal Republic of Nigeria, 2004).

The National Commission for Colleges of Education [NCCE] (2011) provided competency framework for Teachers in Nigeria that, information and communication technology forms the bedrock for a nation's survival and development in a rapidly changing global environment, and hence challenged all and sundry to device courageous initiatives to address issues relating to infrastructure, manpower and open government. Speaking in the same vein, Jamaka (2007) and Nwachukwu (2008) stressed the need to not only fund and provide ICT facilities, but to also train manpower to acquire skills that will be used in leading Nigeria out of the present information doldrums.

The NCE curriculum specified that the teacher is the King-Pin of quality in Education. Expectedly the mission of Teacher Education in Nigeria among others, include;

- i. Production of well-motivated teachers with high personal and professional discipline, integrity and competence for all levels of the educational system.
- ii. Production of professionals who can combine the use of conventional teaching strategies and ICT in generating and imparting knowledge, attitudes and skills at Basic Education level (NCCE, 2011).

Inadequate funding, erratic power supply, obsolete facilities, incompetent teachers, lack of spare parts as well as cost of facilities have been identified as factors that hinder effective utilization of ICT in schools (Okebukola, 2006; Nwachukwu, 2008). Thus, accessibility to computers and other internet facilities has remained a serious problem for many schools in Nigeria (Aliyu, 2007).

1.1 Statement of the Problem

Information and communication technology (ICT) plays an ever important role in increasing economic productivity through digital economies, enhancing the delivery of public and private services and achieving broad socio-economic goals in education. As a result, countries are advancing ICT policies to make their teachers aware of ICT and be competent in using the ICT facilities. Yet, ICT implementation in education is still at embryonic stage in Nigeria (UNESCO, 2011). This could be due to the teachers' incompetent and unaware of the ICT facilities. It is therefore due to the problem stated above that, this study undertakes a survey of ICT awareness and competencies among teachers in Adamawa State, Nigeria.

1.2 Purpose of the Study

The purpose of the study is to assess ICT awareness and competency levels of teachers in Adamawa State. Specifically, the objectives of the study are;

1. To determine the level of teachers awareness about ICT facilities.
2. To identify the level of ICT competencies of teachers.

1.3 Research Question

1. What is the perceived level of awareness and competency of teachers about ICT facilities?

Hypotheses

The following hypotheses were formulated and are tested at 0.05 level of significance;
HO₁: There is no significant difference in the mean responses of graduates and NCE teachers on the level of awareness of ICT facilities.

HO₂: There is no significant difference in the mean responses of graduates and NCE teachers on the level of ICT competencies.

2. METHODOLOGY

Descriptive survey research design was employed for the study. According to Akuezulo (2003) survey research design is used to collect detailed description of existing phenomena with the intent of employing data to justify current conditions and practices, or to make more intelligent plan for improving them. The population of the study comprises of all teachers teaching at secondary schools level in Adamawa State. Two hundred and forty eight teachers was selected using Krejcie and Morgan's table for determining sample size of a population. The instrument for data collection was a structured questionnaire, called Information and Communication Technology Competencies of Teachers Questionnaire (ICTCTQ) developed by the researchers. The instrument consists of 20 items 5-likert scale questionnaire. To ensure the validity and consistency of the instrument, the instrument was face and the content validated by three experts two from the Department of Science Education, Modibbo Adama University of Technology, Yola and one from Gombe State University. Cronbach Alpha was used to determine the reliability of the instrument. The reliability coefficients of the instrument of 0.89 determine the reliability of the instrument. The reliability coefficient of 0.89 was obtained. The researchers administered the questionnaire and collected the responses at the same time to avoid missing any instrument. The data was analysed using mean and standard deviation for the research question and Mann-Whitney U-test for the hypotheses tested at 0.05 level of significance.

3. RESULTS AND DISCUSSION

Research Question 1: What is the level of awareness of mathematics teachers about ICT facilities for teaching in Adamawa State?

Table 1: Perceived Level of Awareness and competency of Teachers about ICT Facilities.

S/No		\bar{X}_{GT}	SD_{GT}	\bar{X}_{NT}	SD_{NT}	RMKS
1.	Computer	3.64	0.31	3.73	0.33	HG
2.	Electrical Type write	2.83	0.29	3.17	0.28	MD
3.	Telephone	2.92	0.35	3.80	0.36	HG
4.	Video Camera	3.81	0.34	3.51	0.30	HG
5.	Microphone	3.86	0.35	3.49	0.31	HG
6.	Headphone	2.87	0.27	3.25	0.27	MD
7.	Photocopier	3.46	0.27	3.42	0.28	MD
8.	Printer	3.17	0.25	3.41	0.29	MD
9.	Television	4.25	0.47	3.71	0.34	HG
10.	Fax	2.01	0.18	3.46	0.23	L
11.	Satellite		2.93	0.29	3.04	0.27
	MD					
12.	Internet		3.54	0.30	3.05	0.28
	MD					
13.	Radio	4.40	0.47	3.72	0.39	HG

14.	Scanner MD	3.06	0.27	3.32	0.31
15.	Video records	3.25	0.32	3.31	MD
16.	Film projector	3.14	0.32	3.22	MD
17.	Multimedia	2.77	0.24	2.91	MD
18.	Diskette MD	3.05	0.29	2.85	0.23
19.	Flash drive	3.53	0.32	2.83	MD
20.	Modem (GSM) MD	3.59	0.36	3.17	0.35

Cluster mean= 3.31 MD

Legend

— X_{GT} =Mean of Graduate Teacher X_G =Grand Mean SD_{GT} =Standard Deviation of Mean of Graduate Teachers L=Low

— X_{NT} =Mean of NCE Teachers RMKS= Remarks SD_{NT} =Standard Deviation of Mean of NCE Teachers HG=High MD=Moderate

Table 1. Presents 20 items on the level of awareness and competencies of teachers about ICT facilities. Six (6) items (computer, telephone, video camera, microphone, television and radio) show that teachers' level of awareness and competencies about ICT facilities for teaching is high with grand means ranging from 3.66-4.06. Thirteen (13) items with means ranging from 2.84 - 3.44 were rated as moderate by the respondents while one (1) item was rated low with of 2.24. On the whole, the cluster mean is 3.31. This shows that teachers' level of awareness and competencies about ICT facilities is moderate.

Hypotheses

HO₁: There is no significant difference in the mean responses of NCE and graduate teachers on the level of awareness of ICT facilities.

Table 2: Mann – Whitney U test of NCE and graduate teachers on the level of awareness of ICT facilities

ICT Awareness Response	
Mann-Whitney U	7386.000
Wilcoxon W	10872.000
Z	-0.428
Asymp. Sig. (2-tailed)	0.668

From Table 2, Table 3, Since the computed Man-Whitney U-test (0.668) is greater than 0.05 level of significance the null hypothesis is accepted and conclude that, there is no significant difference between NCE and graduate teachers about ICT awareness.

HO₂: There is no significant difference in the mean response of NCE and Graduate teachers on the level of ICT competencies.

Table 3: Mann-Whitney U test of NCE and graduate teachers on the level of ICT competencies

ICT Competency Response	
Mann-Whitney U	7471.000
Wilcoxon W	24491.000
Z	0.283
Asymp. Sig. (2-tailed)	0.777

Table 3, Since the computed Man-Whitney U-test (0.777) is greater than 0.05 level of significance the null hypothesis is accepted and conclude that, there is no significant difference between NCE and graduate teachers about ICT competences.

Findings of the Study

1. Both graduate and NCE teachers have moderate level of ICT awareness and competencies
2. NCE and graduate teachers have not differed based on ICT awareness
3. NCE and graduate teachers did not differ based on ICT competencies

4. Discussion of Findings

On the level of awareness about ICT facilities for teaching, NCE and graduate mathematics teachers did not differ in their level of awareness about ICT facilities for teaching. The lack of difference in the level of awareness about ICT facilities may not be unconnected to their exposure to ICT facilities and their background in computer education. Adebayo and Michael (2013) who carried out a research on Assessment of Computer and ICT Skills among Secondary School Teachers in Ota Ogun State agrees with this findings. The study revealed that majority of the teachers in the secondary school sampled was computer literate. Although this is good indication, so much still need to be done. This finding is also in agreement with the work of Burns and Polma (2006) who found out that, learning can be improved when teachers become aware of the wide range of ICT facilities and their uses. They further affirmed that teachers' awareness needs to be flourished and enhanced if we expect much from the teachers. Teacher awareness about ICT facilities and

their uses will assist to increase teachers' confidence and competence for integrating ICT facilities in instruction. This outcome however will happen in reality as a by-product of public awareness and teachers' personal attitude, competence and confidence. Public awareness thrusts huge investment to schools that in turn will help schools to build the necessary infrastructures and distribute access evenly.

Findings relating to research question one (3) and HO₃ shows that NCE and graduate teachers' competencies in the use of ICT facilities for teaching is moderate and did not differ in the ICT competencies needs. The finding of this study is in agreement with the work of Danner (2013) revealed that, there was no significant difference in the perceived competency among students according to gender and academic year/level. However, there was significant difference in the perceived competency among students according to computer training, with those with formal computer training perceived themselves to be most competent in ICT skills. Arolasafe (2005) found out that, teacher competencies in ICT use have the tendency to break professional isolation by allowing educators to communicate, exchange information, interact in chat rooms, and hold discussion forums and virtual conferences. He further stated that when teachers gain computer competencies, their anxiety decreases as their positive disposition to teaching and learning ICT in schools increases. The lack of difference in ICT competencies between NCE and graduate mathematics teachers could be due to similarities in their computer education curriculum.

5. Conclusion

The findings of the study form the basis to draw conclusion that teachers have moderate level of ICT competencies, NCE and graduate teachers did not differ based on the ICT competencies and awareness.

5.1 Recommendation

Teachers should be competent with ICT in order to integrate it into the curriculum for teaching and learning purposes. Teachers should also be encouraged to attend seminars/workshops as well as refresher courses on ICT facilities.

REFERENCES

- [1] Adebayo, F.A.(2008). Usage and Challenges of Information and Communication Technology (ICT) in Teaching and Learning in Nigerian Universities. *Asian Journal of Information Technology* 7(7) 290-295
- [2] Adewoyin, J.A. (2009). *The Place of Information and Communication Technology in Designing and Utilizing Instructional Materials*; Understanding New Technology in Instructional Media/Material Utilization. A book of proceeding on a one Day Train the Trainer Open Workshop (48-68)

- [3] Abolade, A. O. and Yusuf, M. O. (2005). Information and Communication Technologies (ICTs) and the Nigerian Teacher Education Programme. *African Journal of Educational Studies* 3(1), 1-19.
- [4] Federal Republic of Nigeria (2004). *National Policy on Education*. Lagos: NERDC Publication.
- [5] National Commission for Colleges of Education (2011). ICT Competency Framework for Teachers in Nigeria World Bank.
- [6] Unwin, T. (2004). Towards a framework for the use of ICT in teacher training in Africa. *Open Learning: The Journal of Open and Distance Education*, 20, 113-129
- [6] Jamaka, F.A. (2007). Globalization for youth development and employment: A focus on information communication technology. *Gombe Educational Studies Journal* 1, 79-90.
- [7] Nwachukwu, E.C. (2008). Information and Communication Technology in Physical and Health Education: Challenges in 21st century. *Multidisciplinary Journal of Research and Development* 10(5), 138-142.
- [8] Imoko, B.I. & Usman, K.O (2006). Information and Communication Technology: A vital tool for population Education. *Benue State University Journal of Education* 1, 168-172.
- [9] Imoko, M. (2004). How can ICT help us to improve education? *Innovations in Education and Technology International*, 39 (4), 271-280
- [10] Nwabueze, C. (2005). *ICT and social marketing: A critical appraisal: A paper presented at the African Council for Communication Education. National Conference, Benue State University, Makurdi July, 20 - 22.*
- [11] Chaka, J. G. (2008). Information and Communication Technology (ICT) as a vital Tool in the Education Sector reform in Nigeria. *Nigeria Journal of Sociology in Education (NJSE)* 2(2) 182-190.
- [12] Jegede, P.O. (2008). ICT Attitudinal characteristics and use level of Nigerian Teachers. Issues in Informing Science and Information Technology 5. <http://proceedings.informingscience.org/InSITE> 261-266.
- [13] Ojowu, and Agbo, G.C., (2006). Information technology and distance learning in national development. *Benue State University Journal of Education* 7, 73 - 80.
- [14] Idowu, B., Adagunodo, R. and Idowu, B. (2004). Gender difference in computer literacy among Nigerian students: A case study of Abafemi Awolowo university students, *Nigeria Educational Research Journal* 4(3), 137-139.
- [15] Dholakia, R. R., Dholadia, N. & Kshetri, N. (2003). Gender and internet use. *The internet encyclopaedia*, New York.

- [16] UNESCO (2011) ICT Competency Standards for Teachers: Policy Framework [Online] available from UNESCO at: <http://unesdoc.unesco.org/images/0015/001562/156210E.pdf>, retrieved 11 April 2009
- [17] Okebukola, P. (2006). The role of information and Communication technologies (ICTS) in teacher education. *Benue State University Journal of Education*, 7, 1 - 8.
- [18] Aliyu, Z. T. (2007). Globalization of information and communication technology and its implication on Education in Nigeria. *Gombe Educational Studies Journal*, 1, 211-223.
- [19] Akuezulo, E.O. (2003). *Research and Statistics in Education and Social Sciences Methods and Applications*. Ezi-Aba: Nuel Publishers.
- [20] Adebayo, O. and Michael, F. (2013). An Assessment of Computer and ICT Skills Among Secondary School Teachers in Ota, Ogun State. *Library Philosophy and Practice (ejournal)*. <http://digitalcommons.unl.edu/libphilprac/846>. Retrieved on 25th February, 2013.
- [21] Burns, K. & Polma, J. (2006). The impact of ubiquitous in the internet age: How middle school teachers integrate wireless laptops in the initial stages of implementation. *Journal of Technology and Teacher Education*. 14(2), 363-385.
- [22] Danner, R.B (2013). A survey of ICT competencies among students in Teacher preparation programmes at the University of Benin, Benin City, Nigeria. *Journal of Information Technology education*, 12, 33-49
- [23] Arolasafe, G. (2005). *Computer application and use of ICT for teaching and learning*. A paper presented at the North-East workshop on capacity building held at the Adamawa State Polytechnic, Yola.