Published every February and August ISSN 1979-7877

EDUCARE
International Journal for Educational Studies

OLUSOLA ANGELINA THOMAS & MARUFF AKINWALE OLADEJO

Teacher-Trainees' Perceptions of ICT (Information Communication Technology) Integration in Nigerian Teacher Education Programme

ABSTRACT: *Teaching nowadays is fast expanding rapidly and it requires modern technologies to provide more flexible and effective ways of improving teacher education, and connecting teachers to the global community. ICT (Information and Communication Technology) integration into teacher education, therefore, is the key to equipping and producing professional teachers as well as improved pedagogy. However, there is the need to consider the type and nature of teacher trainees before integrating ICT in teacher education programmes, because their perceptions are likely to differ. This study, therefore, focuses on the perceptions of teacher trainees (regular and sandwich students) regarding the integration of ICT in teacher education programme at the UNILAG (University of Lagos) in Akoka, Nigeria. It adopted the descriptive research design. Two hundred and fifty participants were involved. One research question and two hypotheses, based on the specific purposes, were raised and answered in the study. A self-constructed validated and reliable instrument was used to collect data. Results revealed that teacher trainees are favourably disposed to the integration of ICT into teacher education as indicated by the grand mean and standard deviation (M = 3.22; SD = 12.22). Significant differences in the perceptions of teacher-trainees regarding the integration of ICT in teacher education programme based on type of the programme was also discovered (t-cal = -2.315; df = 98; P < .05). Teacher-trainees have to realise that ICT has come to stay in their programme. They need to develop more confidence in their individual ability at becoming computer literate teachers in order to remain relevant in the modern day information age.*

KEY WORDS: *Teacher Education; Information and Communication Technology; Teacher-Trainees; Perceptions; Computer Literate Teachers.*

INTRODUCTION

In recent time, ICT (Information and Communication Technology) has successfully penetrated virtually all human endeavours, including the field of education. G. Grant (2004) and A. McAfee (2006) argued that in the modern age, ICT has influenced and become an integral part of all aspects of our lives (Grant, 2004; and McAfee, 2006). Teacher education has not been an exception. In fact, several studies have been carried out on the integration of ICT into classroom teaching with a view to complementing and modifying the pedagogical practice (*cf* Deaney, Ruthven & Hennessy, 2003; and Hennessy, Ruthven & Brindley, 2005).

About the Authors: **Dr. Olusola Angelina Thomas** is an Academic Staff at the Department of Educational Administration UNILAG (University of Lagos) in Akoka, Nigeria; and **Dr. Maruff Akinwale Oladejo** is currently a Lecturer at the Department of Educational Administration UNILAG in Akoka, Nigeria. For academic interests, the authors can be contacted via their e-mails at: soowler@yahoo.com and maoladejo@unilag.edu.ng

Suggested Citation: Thomas, Olusola Angelina & Maruff Akinwale Oladejo. (2017). "Teacher-Trainees' Perceptions of ICT (Information Communication Technology) Integration in Nigerian Teacher Education Programme" in *EDUCARE: International Journal for Educational Studies*, Volume 10(1), August, pp.1-10. Bandung, Indonesia: Minda Masagi Press owned by ASPENSI, ISSN 1979-7877.

Article Timeline: Accepted (February 22, 2017); Revised (May 20, 2017); and Published (August 30, 2017).

Corroborating S. Hennessy, K. Ruthven & S. Brindley (2005)'s views, Joy Nyenwe & Eunice C. Ishikaku (2012) asserted that integration of ICT in teacher education is a key to providing professional development for teachers, who are the facilitators of education process (Hennessy, Ruthven & Brindley, 2005; and Nyenwe & Ishikaku, 2012). By implication, we believe that the adoption and integration of ICT in all human endeavours has become so important and indispensable such that an illiterate person in modern day work organisation is that person who is unable to utilise ICT-related facilities to carry out his/her duties and responsibilities.

There is a growing importance for ICT within the school curriculum. Not only it is used to support teaching and learning within other curriculum subjects, but it is also a subject in its own right as a separate discipline. In view of this, we are of strong opinion that to effect genuine change in the classroom and produce competent and effective teachers, teacher education must alter its tools, methods, and strategies by adopting modern day ICT that appears to be efficacious.

Since teacher education is mainly designed towards preparing teachers, the quality of teacher education depends on the teacher trainee's abilities and skills. Teacher educators have to come to term with the demands of modern world and modify their old concepts and methods according to the needs of learners. Otherwise, the teachers will become out-dated in the coming future with its devastating consequence on deteriorating the quality and standard of teacher education. Pre-service teachers, therefore, need to develop a vision from the very beginning of their careers for using computers in their classrooms. For this, student teachers must understand computer operations and programming-leading them to develop a vision of the value and use of computers in learning (Hasselbring & Glaser, 2000).

It has been asserted by the Federal Government of Nigeria, in the National Policy on Education in 2013, that no nation can rise above the quality of her education, and also that no educational system can rise above the quality of her teachers (in Paulley & Ikioumoton, 2015). Thus, teachers have been regarded in literature as important components that need to be given attention in the integration of ICT in teaching and learning.

There has, therefore, been an increase awareness of the seminal roles which teachers play in the implementation of ICTs in teaching and learning. Thus, various educational institutions and governments in Africa are emphasizing on teacher development as the key to implementing ICT in teaching and learning, hence, improving the standards of education (Hennessy, Harrison & Wamakote, 2010). They are expected to adopt and use ICTs appropriately in their teaching, hence, implement the changes expected in pedagogy.

It, therefore, presupposes that integrating ICT in teacher education programme needs to be seriously addressed. This might be the rationale behind the launching of ICT Competency Standards for Teachers (ICT-CST) by the UNESCO (United Nations Educational, Scientific, and Cultural Organization) in January 2008 (UNESCO, 2011).

Teaching is increasingly becoming a more challenging profession, where knowledge is rapidly increasing and technology is also changing enormously. Studies have confirmed that when ICT is used appropriately by teachers, there will be positive impact on the way the teachers teach and the way the learners learn, thus, improving pedagogy (Hennessy, Ruthven & Brindley, 2005; Hennessy, Harrison & Wamakote, 2010; and Nyenwe & Ishikaku, 2012). This, therefore, demands that teacher-trainees have to learn how to use these new technologies in their programme, thus their perceptions about the integration of ICT need to be investigated as this will help in determining how, when, and where ICT should be integrated.

Based on the afore-discussed, it becomes highly imperative that attempt be made at investigating the perceptions of teacher-trainees (both regular and sandwich), about the integration of ICT in teacher education programme. This is because teacher-factor has been regarded as an important issue

ISSN 1979-7877 *and* ***www.mindamas-journals.com/index.php/educare***

for consideration when integrating and implementing ICTs into teaching and learning process.

A. Khirwadkar (2007) also argued, therefore, that pre-service teachers need to develop a vision from the very beginning of their careers for using computers in their classrooms (Khirwadkar, 2007). For this, student teachers must understand computer operations and programming-leading them to develop a vision of the value and use of computers in learning.

Literature Review. A brief literature review was carried out in this sub-section. This becomes necessary so as to have a better understanding of relevant concepts and variable in the study. It was also carried out in order to be familiar with some of the previous studies earlier done in this area. We will review related to: (1) The Concept of Teacher Education; (2) Conceptualising Information and Communication Technology; (3) Introduction and Development of ICT in Nigeria; (4) Challenges of ICT Integration in Teacher Education; (5) Students' Perceptions of ICT Integration in Teacher Education; and (6) Skills and Competencies Required of Teacher-Trainees.

First, **the Concept of Teacher Education.** Teacher education has been variously defined by scholars in the field of education. For instance, C.F. Okafor (1988), as cited in Onyemerekeya (2002), described teacher education as a form of education, which is properly planned and systematically tailored and applied for the cultivation of those who teach or will teach, particularly but not exclusively, in primary and post-primary levels of education (Okafor, 1988; and Onyemerekeya, 2002).

Teacher education refers to that educational programme basically designed with a view to equipping the would-be-teachers with the attitudes, skills, and knowledge; required of them to perform their tasks effectively in the classroom, school, and wider community (Adeosun, Oni & Oladipo, 2009). According to H. Perraton (2007), teacher education generally includes four elements and the balance between them varies widely. These elements have to do with improving the general educational background of the teacher-trainees; increasing their knowledge and understanding of the subjects they are to teach; pedagogy and understanding of children and learning; and the development of practical skills and competences (Perraton, 2007).

In Nigeria, teacher education is provided in Colleges of Education, Faculties and Institutes of Education and Universities, National Teachers' Institute, and some Schools of Education of Polytechnics.

Second, **Conceptualising Information and Communication Technology.** ICT (Information and Communication Technology) is an equipment or interconnected system of equipment that is used in the automatic acquisition, storage, manipulating, management, control, display, switching, and transmission of information (FRN, 2004:9; and Oluyomi, 2007). ICT is described as a generic term referring to technologies, which are being used for collecting, storing, editing, and passing of information in various forms (Jager & Lokman, 1999).

In the submission of A.C. Ololube, A. Ubogu & A.G. Ossai (2006), ICT refers to advances in technology that provides a rich global resources and collaborative environment for dissemination of ICT literacy materials, interactive discussions, research information, and international exchange of ideas, which are critical for advancing meaningful education initiative, training high skilled labour force, and understanding issues related to economic development (Ololube, Ubogu & Ossai, 2006).

Third, **Introduction and Development of ICT in Nigeria.** ICT (Information and Communication Technology), particularly computer education, was introduced in Nigeria around mid-1960s, with the assistance of IBM (International Business Machines) that set up computer centres at the Universities of Ibadan, Ibadan; University of Lagos, Akoka; Obafemi Awolowo University, Ile-Ife; University of Nigeria, Nsukka; and Ahmadu Bello University, Zaria (Nwezeh, 2010). These computer centres later metamorphosed into MDC (Manpower

ISSN 1979-7877 and www.mindamas-journals.com/index.php/educare

Development Centres), according to Joy Nyenwe & Eunice C. Ishikaku (2012). However, the idea of introducing computer education into secondary education was conceived during the 32nd meeting of the NCE (National Council on Education) in Nigeria, in 1987 (Nyenwe & Ishikaku, 2012).

Several other measures and initiatives have been put in place towards the development of ICT in Nigeria. These include the implementation of ICT Policy on April 18, 2001, which paved the way for the establishment of NITDA (National Information Technology Development Agency), the production of NPIT (Nigerian Policy for Information Technology) by the NICTA (Nigeria Information and Communication Technology Agency).

Furthermore, the NITDEF (National Information Technology Development Fund) was established; and on August 7, 2004, the NICTSAPC (National Information and Communication Technologies Strategic Action Plan Committee) was inaugurated by the Federal Government of Nigeria. All these measures, philosophies, and objectives have equally been captured and incorporated in the current National Policy on Education in 2013 (Omale & Ibietan, 2013). These measures, as opined by P.O. Jegede & J.A. Owolabi (2003) and C.O. Uwadia (2003), were adopted by the Federal Government as a way of harnessing the benefits of ICT in national development and as well building her human capacity (Jegede & Owolabi, 2003; and Uwadia, 2003).

Fourth, **Challenges of ICT Integration in Teacher Education.** Every innovation comes with some challenges that must be handled before any success is achieved. Some of the challenges in the integration of ICT (Information and Communication Technology) in teacher education, in reference to Joy Nyenwe & Eunice C. Ishikaku (2012), are as follwing here:

Lack of Good Accommodation. A major challenge in effective ICT (Information and Communication Technology) integration is suitable accommodation in teacher training institutions, where the equipment will be kept and use. Where there is none-one has to be built and properly electrified. In case of existing structures, its electrification fitting has to be ascertained, because safety is important.

Population. The number of students in the institutions, serving teacher, and head-teachers are much. Providing all with computers will be quite challenging, because of its cost involvement.

Regular Irregular Power Supply. There is no doubt that regular and adequate power supply to run the equipment is important. Power situation in Nigeria poses a serious challenge. So, alternative (solar or generator) source must be provided.

Lack of ICT Skilled Manpower Technicians. Lack of ICT (Information and Communication Technology) skilled manpower or technicians, who will help train the teachers. This caliber of personnel is needed in the maintenance of the equipment. These services are important in success of the integration.

Lack of ICT Pedagogy Professional. Nigeria lack manpower in terms of professionals that can effectively train teachers on the use of ICT (Information and Communication Technology) for teaching and learning, as well as develop the softwares that are compatible with the various curriculum (*cf* Nyenwe & Ishikaku, 2012; and Omale & Ibietan, 2013).

Fifth, **Students' Perceptions of ICT Integration in Teacher Education.** Generally, teachers are expected to know how to successfully integrate ICT (Information and Communication Technology) into his/her subject areas to make learning more meaningful (Uwadia, 2003; and Nyenwe & Ishikaku, 2012). This knowledge development during pre-service training has gained much importance with the notion that exposure to ICT during this time is helpful in increasing student teachers' willingness to integrate technology into classroom teaching. Pre-service teachers need to plan to use computers in their classrooms (Omale & Ibietan, 2013; and Paulley & Ikioumoton, 2015).

According to A. Khirwadkar (2007), it has generally been found that pre-service teachers have demonstrated their ability for integrating technology into their teaching, but do not have clarity about how far technology can be beneficial for students (Khirwadkar,

ISSN 1979-7877 and www.mindamas-journals.com/index.php/educare

2007). There have been several studies which probed into the attitude of teacher-trainees towards the integration and use of technology, with findings that revealed the importance of attitudes for learning to use technologies (*cf* Khirwadkar, 2007; Adeosun, Oni & Oladipo, 2009; Nyenwe & Ishikaku, 2012; Edwards, 2013; Aubrey & Dahl, 2014; and Bird & Edwards, 2014).

Sixth, **Skills and Competencies Required of Teacher-Trainees.** For teacher-trainees to be able to integrate ICT (Information and Communication Technology) successfully, they have to acquire and develop certain skills and competencies. These skills and competencies to be developed on the part of student teachers, according to A. Khirwadkar (2007), include as following here:

> Surfing the internet and locating useful information from the Internet for the development of lesson plans.
> Developing lessons plans incorporating student use of technology in the learning process.
> Evaluating and selecting appropriate software for a particular subject and per student needs.
> Generating printed documents, like student assignments, newsletters, communication, etc. utilizing a variety of applications software like word processing and desktop publishing.
> Managing student data, using data management tools for efficiently managing learning.
> Using technology to gather, organize, and report information about student performance like Excel and Access for database management.
> Developing tools to evaluate technology-based student projects, including multi-media, word processing, database, spreadsheet, PowerPoint, desktop publishing, and Internet/ telecommunications.
> Using the internet to support professional development, including locating professional organizations, communicating with other teachers electronically, and participating in on-line professional development workshops and seminars.
> Developing assignments and project work for students, giving them broader and deeper knowledge in a field of study, and developing critical thinking and infusing creativity among students (Khirwadkar, 2007).

There is the need to consider the type and nature of teacher trainees before integrating ICT (Information and Communication Technology) in teacher education programme, because their perceptions are likely to be dissimilar since regular and sandwich students are not likely to be facing similar challenges in the programme. Besides, teachers' educational beliefs can be barriers to ICT integration (Ertmer, 2005; and Hermans *et al.*, 2008). All these serve as the motivating factors that necessitated the present study.

Thus, the problem of this study is to investigate the perceptions of regular and sandwich teacher-trainees about the integration of ICT in teacher education programme at the UNILAG (University of Lagos) in Akoka, Nigeria. The purpose of the study was to determine the perceptions of teacher-trainees (regular and sandwich students) regarding the integration of ICT in teacher education programme at the UNILAG in Akoka, Nigeria.

Specifically, the study aims: (1) to determine the perceptions of teacher-trainees regarding the integration of ICT in teacher education programme in terms of structure, contents, challenges, and outcomes; (2) ascertain the difference in the perceptions of regular and sandwich teacher-trainees about the integration of ICT in teacher education programme; and (3) to ascertain gender difference in the perceptions of teacher-trainees about the integration of ICT in teacher education programme.

The research question is "What are the perceptions of teacher-trainees regarding the integration of ICT in teacher education programme in terms of structure, contents, challenges, and outcomes?". While the Hypotheses are: (1) "There is no significant difference in the perceptions of regular and sandwich teacher-trainees about the integration of ICT in teacher education programme"; and (2) "The perceptions of teacher-trainees about the integration of ICT in teacher education programme do not significantly differ based on gender".

METHODS

The procedure adopted in conducting this study, in terms of the research design, study population, sample and sampling technique, instrumentation, validity and reliability of the instrument, procedure for instrument

ISSN 1979-7877 and www.mindamas-journals.com/index.php/educare

administration, and method of data analysis, was brought to the fore in this sub-section (*cf* Creswell, 1994; Berg, 2000; Jefferies & Diamond, 2001; Thompson, 2002; Peavey, 2003; Haywood & Lidz, 2007; Cody, 2011).

The study adopted the descriptive research design to ascertain the differences in the perceptions of regular and sandwich teacher trainees undergoing Bachelors degree programme in education at the UNILAG (University of Lagos) in Akoka, Nigeria, during 2013/2014 academic session.

The population consisted of 3,512 regular and sandwich teacher trainees at the Faculty of Education UNILAG in Akoka, Nigeria, as at the time of conducting this study. Two hundred and fifty participants were selected for the study through disproportionate stratified random sampling technique. The participants were first separated into regular and sandwich. One hundred and fifty regular students and one hundred sandwich students were then sampled, regardless of the population of each stratum.

A self-constructed instrument titled: "TTPICTIS (Teacher-Trainees' Perceptions of Information and Communication Technology Integration Scale)" was used for the study. It comprised two parts. Part one sought information on socio-demography background of the subjects, such as age, gender, marital status, and type of programme. The second part probed into the perceptions of the participants, which they rated on a modified four-point Likert scale of SA (Strongly Agreed), A (Agreed), D (Disagreed), and SD (Strongly Disagreed), with score weights of 4, 3, 2, and 1 respectively (Creswell, 1994). Positive statements were score in ascending order, while negatives ones were scored in descending order for effective data analysis.

The validity of the instrument, in terms of face and contents, was ascertained by Colleagues in the Department of Educational Administration and Measurement and Evaluations. Also, a pilot study was carried out in order to determine the reliability of the instrument. Cronbach Alpha was used for reliability test, and an Alpha value of .78 was obtained (Creswell, 1994). This is good enough for the instrument to be relied on.

The administration of the instrument was jointly done by the researchers with the supports of four Class Governors who serve as Research Assistants after each of the Researcher's lectures. Three hundred copies of the instrument were distributed, with two hundred and ninety-one retrieved. Two hundred and fifty copied that were completely filled were eventually used for the study.

Descriptive statistics of frequency and percentages was used to describe the demographic background of the subjects (Cody, 2011). On the other hand, inferential statistics was used to answer the four research questions. Research questions 1 and 2 were answered with the aid of PPMCC (Pearson Product-Moment Correlation Coefficient), while Student Independent t-test was used to answer research questions 3 and 4 (Haywood & Lidz, 2007).

FINDINGS AND DISCUSSION

Findings. Results obtained from the analysed data are as presented below. This was followed by its discussions. Research question 1: "What are the perceptions of teacher-trainees regarding the integration of ICT (Information and Communication Technology) in teacher education programme in terms of structure, contents, challenges and outcomes?". The answer, and further discussion, as shown in table 1.

Table 1 showed the results of the perceptions of teacher-trainees as regards the integration of ICT (Information and Communication Technology) in teacher education programme in terms of structure, contents, challenges, and outcomes. With respect to *Structure*, majority of the teacher-trainees that participated in the study agreed to the structure of ICT integration as indicated by the first item (M = 3.65; SD = .539), and the second item (M = 3.60; SD = .550), but disagreed to the third item (M = 2.38; SD = .972).

The perceptions of the teacher-trainees about the contents of ICT integration as shown in the table 1 indicated that majority of them agreed to the three items (M = 3.47; SD = .731), (M = 2.55; SD = .880), and (M

ISSN 1979-7877 and www.mindamas-journals.com/index.php/educare

Table 1:
Perceptions of Teacher-Trainees Regarding the Integration of ICT in Teacher Education Programme

SN	Categories/Items	X	SD
	Structure:		
1.	I see the integration of ICT in teacher education as an opportunity to create a positive learning environment to learn.	3.6500	.53889
2.	I believe that the integration of ICTs in teacher education will help me carry out my assignment and other research work.	3.6000	.55048
3.	I think it is difficult to integrate ICT in teacher education.	2.3800	.97214
	Contents:		
1.	I think ICT integration into the entire curriculum of teacher education will broaden my breadth and scope.	3.4700	.73106
2.	I think it is difficult to integrate ICT in teacher education.	2.5500	.88048
3.	ICT integration in teacher education will enable me acquire the skills and knowledge I need to use technology effectively in my course of study.	3.4800	.71746
4.	Our curriculum has not been designed in a way to allow ICT integration.	3.0000	.79137
	Challenges:		
1.	Inadequate facilities have affected the integration of ICT in teacher education.	3.4200	.76779
2.	The problem of power supply will not enhance effective integration of ICT in teacher education.	3.1800	.95748
3.	Technical incompetence on the part of lecturers will be a challenge to ICT integration in teacher education.	3.1600	.82536
4.	Technical incompetence on the part of students will be a challenge to ICT integration in teacher education.	3.1400	.87640
5.	Resistance to change form the traditional pedagogical methods to more innovative technology based method of teaching and learning will hamper ICT integration in teacher education.	3.0400	.80302
6.	Population of teacher trainees is a challenge to ICT integration in teacher education.	2.9500	.92524
	Outcomes:		
1.	Integrating ICT in teaching methods will enhance my academic performance.	3.5500	.57516
2.	ICT integration in teacher education will help me perform better during teaching practice.	3.4100	.69769
3.	I believe that ICT integration in teacher education will prepare me to be technology-using teacher after my programme.	3.5100	.61126
	Grand Mean	**3.22**	**12.22**

= 3.48; SD = .717) respectively. In terms of challenges, the table 1 also showed that the greatest challenge facing the teacher-trainees in ICT integration into teacher education was item number one (M = 3.42; SD = .768), followed chronologically by items two, three, four, five, and six respectively.

It was also shown in the table 1 that as regards teacher-trainees' expectations in terms of outcomes, majority of the participants believed that integrating ICT in teaching methods will enhance their academic performance (M = 5.55; SD = .575), closely followed by the third item (M = 3.51; SD = .611), and the second item (M = 3.41; SD = .697) respectively. On a final note, the table 1 showed that generally, the participants were favourably disposed to the integration of ICT into teacher education as indicated by the grand mean and standard deviation (M = 3.22; SD = 12.22).

$HO_{1:}$ "There is no significant difference in the perceptions of regular and sandwich teacher-trainees about the integration of ICT in teacher education programme".

From table 2, it is shown that there was significant difference in the perceptions of regular and sandwich teacher-trainees about the integration of ICT (Information and Communication Technology) in teacher education programme (t-cal = -2.315; df = 98; P < .05). Regular students appear to have positive perceptions about the integration of ICT in teacher education programme than the sandwich students. Thus, the researchers failed to accept the null hypothesis.

ISSN 1979-7877 and www.mindamas-journals.com/index.php/educare

Table 2:
Significant Difference in the Perceptions of Regular and Sandwich Teacher-Trainees about the Integration of ICT in Teacher Education Programme.

Var	Studentship	N	X	SD	df	t-Cal	P	Rmk	Dec
	Regular	66	37.7385	7.42670	-	-	-	-	-
Perceptions	-	-	-	-	98	-2.315	.035*	Sig	Reject
	Sandwich	34	34.8235	1.26660	-	-	-	-	-

*Difference is significant at the 0.05 level.

Table 3:
Significant Difference in the Perceptions of Regular and Sandwich Teacher-Trainees about the Integration of ICT in Teacher Education Programme

Var	Gender	N	X	SD	df	t-Cal	P	Rmk	Dec
	Male	35	37.8080	4.82550	-	-	-	-	-
Perceptions	-	-	-	-	98	-.033	.973	Not Sig	Reject
	Female	65	37.8400	8.72716	-	-	-	-	-

*Difference is significant at the 0.05 level.

$HO_{2:}$ "The perceptions of regular and sandwich teacher-trainees about the integration of ICT in teacher education programme do not significantly differ based on gender".

From table 3, it is revealed that gender makes no significant difference in the perceptions of regular and sandwich teacher-trainees about the integration of ICT (Information and Communication Technology) in teacher education programme (t-cal = -.033; df = 98; P > .05). All students, regardless of gender, have positive perceptions about the integration of ICT in teacher education programme. Thus, the authors therefore, failed to reject the null hypothesis.

Discussion. Findings from the research question show that there was favourable disposition of teacher-trainees about the integration of ICT (Information and Communication Technology) into teacher education as indicated by the grand mean and standard deviation (M = 3.22; SD = 12.22). This finding corroborates some previous studies done in formal higher education settings that documented positive teacher attitudes toward the use of ICT as teaching tools, as cited by T. Le & Q. Le (1999) and K. Brandl (2002); but contradicts the finding of E. Smeets (2005), who stressed that most teachers do not utilize the potential of ICT to maximize the quality of learning environments, which is due to their poor perceptions about ICT utilization (*cf* Le & Le, 1999; Brandl, 2002; and Smeets, 2005).

As regards the first hypothesis, it was shown that there was significant difference in the perceptions of regular and sandwich teacher-trainees about the integration of ICT in teacher education programme (t-cal = -2.315; df = 98; P < .05). This finding might not be unconnected with the fact that regular students have more time and are younger than the older ones in Sandwich programmes. They perhaps, embrace ICT more than their sandwich counterparts.

Finally, finding from the second hypothesis revealed that gender makes no significant difference in the perceptions of regular and sandwich teacher-trainees about the integration of ICT in teacher education programme (t-cal = -.033; df = 98; P > .05). This contradicts the finding of M. Prensky (2001), who reported that gender, age and subject teaching are significant in the integration of ICT in teaching practice.

CONCLUSION

The use of ICT (Information and Communication Technology) can play a number of vital roles in education by changing the teaching and learning process.

ISSN 1979-7877 and www.mindamas-journals.com/index.php/educare

However, ICT integration is not easy task. There are significant challenges in integrating ICTs use in education rising from environmental, cultural, and educational faced by policy makers, educators, educational administrators, and students in higher education.

It is very important for educational policymakers and planners before any ICT implementation in education to carefully consider the following: (1) Policymakers should also look at the ubiquity of different types of ICT in the country in general and in the educational system in particular; (2) Students should be encouraged to embrace technology, which will go a long way at making teaching-learning more effective and meaningful; (3) Teachers should always be exposed to regular updates as regards ICT integration through several on-the-job-training opportunities; (4) Hybrid or blended form of learning should be practiced as this will ensure regular exposure to technology utilisation; and (5) Institutional administrators as well as government should find ways of tackling the challenges facing effective ICT integration, especially the irregular power supply.[1]

References

Adeosun, O., A. Oni & A. Oladipo. (2009). "Teacher Training Quality and Effectiveness in the Context of Basic Education: An Examination of Primary Education Studies (PES) Programme in Two Colleges of Education in Nigeria" in *Journal of International Cooperation in Education*, Vol.12, No.1, pp.107-125. Available online also at: http://home.hiroshima-u.ac.jp/cice/wp-content/uploads/2014/03/12-1-8.pdf [accessed in Akoka, Nigeria: August 2, 2016].

Aubrey, C. & S. Dahl. (2014). "The Confidence and Competence in Information and Communication Technologies of Practitioners, Parents, and Young Children in the Early Years Foundation Stage" in *Early Years*, Volume 34(1), pp.94-108.

Berg, B.L. (2000). *Qualitative Research Methods for the Social Sciences*. Boston, MA: Allyn and Bacon.

Bird, J. & S. Edwards. (2014). "Children Learning to Use Technologies Through Play: A Digital Play Framework" in *British Journal of Educational Technology*, Issue of August.

Brandl, K. (2002). "Integrating Internet-Based Reading Materials into the Foreign Language Curriculum: From Teacher-to Student-Centered Approaches" in *Language Learning & Technology*, Volume 6(3), pp.87-107.

Cody, Ron. (2011). *Statistics by Example*. Cary, North Carolina, USA [United States of America]: SAS Institute Inc.

Creswell, J.W. (1994). *Qualitative and Quantitative Approaches*. London: Sage.

Deaney, R., K. Ruthven & S. Hennessy. (2003). "Pupil Perspectives on the Contribution of Information and Communication Technology in to Teaching and Learning in the Secondary School" in *Research Papers in Education*, Volume 18(2), pp.141-165

Edwards, S. (2013). "Digital Play in the Early Years: A Contextual Response to the Problem of Integrating Digital Technologies and Play-Based Learning in the Early Childhood Curriculum" in *European Early Childhood Education Research Journal*, Volume 21(2), pp.199-212.

Ertmer, P.A. (2005). "Teacher Pedagogical Beliefs: The Final Frontier in Our Quest for Technology Integration?" in *Educational Technology Research and Development*, Volume 53(4), pp.25-39.

FRN [Federal Republic of Nigeria]. (2004). *National Policy on Education*. Yaba: NERDC Press.

Grant, G. (2004). "What Really Matter about IT" in *Journal of Global Information Management*, Vol.12, Iss.3 [July-September].

Hasselbring, T.S. & C.H.W. Glaser. (2000). "Use of Computer Technology to Help Students with Special Needs" in *Children and Computer Technology*, Vol.10, No.2 [Fall/Winter]. Available online also at: https://www.princeton.edu/futureofchildren/publications/docs/10_02_04.pdf [accessed in Akoka, Nigeria: August 2, 2016].

Haywood, H.C. & C.S. Lidz. (2007). *Dynamic Assessment in Practice: Clinical and Educational Applications*. Cambridge, UK [United Kingdom]: Cambridge University Press.

Hennessy, S., D. Harrison & L. Wamakote. (2010). "Teacher Factors Influencing Classroom Use of ICT in Sub-Saharan Africa" in *Online Journal of African Studies,* Volume 2(3), pp.39-54.

Hennessy, S., K. Ruthven & S. Brindley. (2005). "Teacher Perspectives on Integrating ICT into Subject Teaching: Commitment, Constraints, Caution, and Change" in *Curriculum Studies,* Volume 37(2), pp.155-192.

Hermans, R. *et al*. (2008). "The Impact of Primary School Teachers' Educational Beliefs on the Classroom Use of Computers" in *Computers and Education,* Volume 51(4), pp.1499-1509.

Jager, A.K. & A.A. Lokman. (1999). "Impacts of ICT in Education: The Role of the Teacher and Teacher Training". *Paper* presented at the European Conference on Education Research, Lahti, Finland, on 22-25 September.

Jefferies, J. & I. Diamond. (2001). *Beginning Statistics: An*

[1]***Statement:*** We have, herewith, declared that this paper is our original work; so, it is not product of plagiarism and not yet also be reviewed as well as published by other scholarly journals.

ISSN 1979-7877 and www.mindamas-journals.com/index.php/educare

Introduction for Social Scientists. London: Sage.
Jegede, P.O. & J.A. Owolabi. (2003). *Computer Education in Secondary Schools*: Ibadan: Daily Graphics.
Khirwadkar, A. (2007). "Integration of ICT in Education: Pedagogical Issues". Available online at: www.journal.au.edu/jan2007/article06.Vol.1.no.1 [accessed in Akoka, Nigeria: August 2, 2016].
Le, T. & Q. Le. (1999). "A Web-Based Study of Students' Attitudes towards the Web" in *Proceedings of ED-MEDIA*, Seattle, Washington, USA [United States of America], pp.747-752.
McAfee, A. (2006). "Mastering the Three Worlds of Information Technology" in *Harvard Business Review*, Vol.84, Iss.11, pp.141-149.
Nwezeh, C.M.T. (2010). "The Use of ICT in Nigerian Universities: A Case Study of Obafemi Awolowo University, Ile-Ife". Available online at: http://www.webpages.uidaho.edu/~mbolin/nwezeh3.htm [accessed in Akoka, Nigeria: August 2, 2016].
Nyenwe, Joy & Eunice C. Ishikaku. (2012). "Integration of Information and Communication Technology (ICT) in Teacher Education for Capacity Building" in *Journal of Education and Practice*, Vol.3, No.10. Available online also at: file:///C:/Users/acer/Downloads/2534-4542-1-PB.pdf [accessed in Akoka, Nigeria: August 2, 2016].
Okafor, C.F. (1988). *Nigerian Teacher Education: A Search for New Direction*. Enugu: Fourth Dimension Publishing Co., Ltd.
Ololube, A.C., A. Ubogu & A.G. Ossai. (2006). "ICT and Distance Education in Nigeria: A Review of Literature and Accounts" in *IODL (International Open and Distance Learning) Symposium,* Volume 2, pp.643-655. Available online also at: http://www.iodl.uk/public/itbook/kintns.htm [accessed in Akoka, Nigeria: August 2, 2016].
Oluyomi, S.M. (2007). "Application of Information and Communication Technology (ICT) in Agricultural Extension Delivery System". Available online at: http://globalacademicgroup.com/journals/coconut/Application%20of%20.pdf [accessed in Akoka, Nigeria: August 2, 2016].
Omale, I. & J. Ibietan. (2013). "Policy and Management Issues in Contemporary Nigerian Education System" in *AFRREV: An International Journal of Arts and Humanities*, Vol.2(4), No.8 [September], pp.81-104. Available online also at: https://www.ajol.info/index.php/ijah/article/viewFile/106698/96604 [accessed in Akoka, Nigeria: August 2, 2016].
Onyemerekeya. (2002). *Teacher Education in Nigeria*. Owerri: Vantage Publications Ltd.
Paulley, F.G. & G. Ikioumoton. (2015). "The Policy and Practice of Preparing the Nigerian Teacher for the Challenges of the New Generation: The National Policy on Education in Focus" in *IOSR: Journal of Research & Method in Education,* Vol.5, Iss.1 [January-February], pp.12-22. Available online also at: http://www.iosrjournals.org/iosr-jrme/papers/Vol-5%20Issue-1/Version-3/C05131222.pdf [accessed in Akoka, Nigeria: August 2, 2016].
Peavey, F. (2003). *Strategic Questioning*. San Francisco: Crabgrass.
Perraton, H. (2007). *Teacher Education: The Role of Open and Distance Learning*. London: Routledge.
Prensky, M. (2001). "Digital Natives: Digital Immigrants" in *On the Horizon,* Volume 9(5), pp.1-2.
Smeets, E. (2005). "Does ICT Contribute to Powerful Learning Environments in Primary Education?" in *Computers and Education*, Volume 44(3), pp.343-355.
Thompson, S.K. (2002). *Sampling*. New York: John Wiley and Sons.
UNESCO [United Nations Educational, Scientific, and Cultural Organization]. (2011). *Transforming Education: The Power of ICT Policies*. Paris, France: UNESCO. Available online also at: http://unesdoc.unesco.org/images/0021/002118/211842e.pdf [accessed in Akoka, Nigeria: August 2, 2016].
Uwadia, C.O. (2003). "Information and Technology Education in Nigeria: Challenges and Opportunities". *A paper* presented at the 2nd Global NCS/NITPA IT Conference, in Washington D.C., on March 11-15.

ISSN 1979-7877 *and* ***www.mindamas-journals.com/index.php/educare***