Volume-2, Issue-5, September-2018: 251-262
International Journal of Recent Innovations in Academic Research **ISSN: 2635-3040**

An Assessment of Secondary School Teachers' Uses of Ict's in Borno State, Nigeria

[1]Saidu, Ibrahim, [2]Usman, Talba and [3]Ezekiel, Danjuma

[1]Federal College of Freshwater Fisheries Technology, Baga, P.M.B 1060, Borno State, Nigeria
[2, 3] College of Education Waka-Biu, Borno state, Nigeria
Corresponding Author E-mail: yirnggau@gmail.com

Abstract: The use of ICTs in Nigeria and African countries generally is increasing. However, while there is a great deal of knowledge about how ICTs are being used in developed countries, there is not much information on how ICTs are being used by teachers in developing countries. This study examined Nigeria secondary school teachers' uses of ICTs and its implications for further development of ICTs use in Nigerian secondary schools. The sample of the study comprises 435 teachers from thirteen randomly selected secondary schools in Biu Education Zone, Borno state, Nigeria. This comprised 294 males and 141 females. Their age ranged from 25–45 years with a mean age of 35 years. A modified instrument tagged Teachers ICT use survey adapted from ICT survey indicator for teachers and staff and ICT Teachers Survey by New Zealand Ministry of Education were used for the collection of data. The results showed that teachers generally have access to ICTs in their various schools except e-mail and Internet because their schools are not connected. Technical support are lacking in the schools and teachers lack of expertise in using ICT was indicated as being the prominent factors hindering teachers readiness and confidence of using ICTs during lesson. Furthermore, the results show that teachers perceived ICT as being easier and very useful in teaching and learning. It was recommended among others that teacher training and professional development oriented policies should support ICT-related teaching models that encourage both students and teachers to play an active role in teaching/learning activities.
Keywords: Information communication technologies, Teachers, Teaching and Learning, Secondary schools.

Citation: Saidu Ibrahim, Usman Talba and Ezekiel Danjuma. 2018. An Assessment of Secondary School Teachers' Uses of ICT's in Borno State, Nigeria. International Journal of Recent Innovations in Academic Research, 2(5): 251-262.

Introduction

Africa have witness the development of ICTs in various sectors over the last decade including education. The change from teacher-centred education system to learner centred education all over the world in the past few years contributes to the use of ICTs in education. In order to achieve a "Knowledge–Driven world" as conceived by (Hawkins, 2004; Inwent, 2004), it means that education reform practices should focus on equal access and quality of education which should highlight the importance of change in the education sector through use of ICTs and equipping new generations with enhanced skills to operate in the 21st century. The use of ICTs in Nigeria and African countries generally is increasing and dramatically growing.

However, while there is a great deal of knowledge about how ICTs are being used in developed countries, there is not much information on how ICTs are being introduced into schools in developing countries (Beukes-Amiss and Chiware, 2006).

Developing countries according to these authors, there is generally limited access time per month using ICTs by both the teachers and students, and even less time spent with reliable Internet access. It should be noted that availability of ICTs vis-à-vis access in term of ratio of teachers and students differs significantly. Despite this, the new and emerging technologies challenges the traditional process of teaching and learning, and the way education is managed. While information communication technology is an important area of study in its own right, it is having a major impact across all curriculum areas.

Easy worldwide communication provides instant access to vast array of data, challenging assimilation and assessment skills (Fowowe, 2006). Rapid communication plus increased access to ICTs in the home, at work, and in educational establishment, could mean that learning becomes a truly lifelong activity- an activity in which the pace of technological change forces constant evaluation of teaching process itself. Formerly, the term IT was used to mean ICT, the term which was synonymous with computer but as the passage of time, it covered other equipment created to enhance acquisition, storage and dissemination of information materials. Most of these equipment were initially confine to the vicinity of offices. Libraries in the course of time embraced the use of these equipment to carry out their day-to-day activities as usage was adapted to carry out some routine activities. It functions does not end there. The current issue is the use of ICTs in the classroom by the teachers. This includes specifically the use of computers, Internet, telephone, digital camera, data projector, etc. As the world continues to revolve around technology, teachers need to continue incorporating these new technologies into their teaching.

Meanwhile, it is observed that some studies have been conducted on uses of ICTs by teachers particularly on the issue of their professional development. Most of these studies were carried out in developed countries where the use of ICTs has come of age, and where there are resources and material to maintain them. However, the use of ICTs by teachers in Nigeria is just beginning to gain popularity and researches in the area have just started emerging. Emphatically, the use of ICTs by teachers to teach the students is highly advantageous. This is because its enable them to demonstrate understanding of the opportunities and implications of the uses for learning and teaching in the curriculum context; plan, implement, and manage learning and teaching in open and flexible learning environment (UNESCO, 2004). In the light of these therefore, more research is needed to showcase further development of ICTs use by secondary school teachers in Nigeria. Hence there is the need to assess Secondary School Teachers Uses of ICT's in Borno State, Nigeria.

Purpose of the Study

The main purpose of this study is to Assess Secondary School Teachers Uses of ICT's in Nigerian secondary Schools. The specific objectives are to:

1. Determine which ICTs do teachers have access to in their schools and what is the frequency of their access per week
2. Determine the adequacy level of the various aspects of ICT availability/ access in respondents' schools
3. Determine the factors hindering teachers' readiness and confidence in using ICT
4. Determine the teachers' perception about the perceived ease of using ICT
5. Determine the teachers' perception about the perceived usefulness of ICT

Research Questions

To achieve the stated objective of the study, the following research questions were raised to guide the study.

1. Which ICTs do teachers have access to in their schools and what is the frequency of their access per week?
2. What is the adequacy level of the various aspects of ICT availability/ access in respondents' schools?
3. What are the factors hindering teachers' readiness and confidence in using ICT?
4. What is the teachers' perception about the perceived ease of using ICT?
5. What is the teachers perception about the perceive usefulness of ICT?

Information Communication Technologies/ Technology

Information communication technologies (ICTs) are information handling tools that are used to produce, store, process, distribute and exchange information. These different tools are now able to work together, and combine to form networked world which reaches into every corner of the globe (UNDP Evaluation Office, 2001). It is an increasingly powerful tool for participating in global markets, promoting political accountability; improving the delivery of basic services; and enhancing local development opportunities (UNDP, 2006). To Ogunsola (2005:3) ICT "is an electronic 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". It can be used to access global knowledge and communication with other people (Ogunsola, 2005:3). Students who use ICTs gain deeper understanding of complex topics and concepts and are more likely to recall information and use it to solve problems outside the classroom (Apple Computer, 2002). In addition, through ICT, students extend and deepen their knowledge, investigation, and inquiry according to their needs and interest when access to information is available on multiple levels (CEO Forum on Education and Technology, 2001:8).

Teachers and Instructional Applications of ICTs

Many different types of technology can be used to support and enhance learning. Everything from video content and digital movie making to laptop computing and handheld technologies has been used in classrooms. Similarly, new uses of technology such as pod casting are constantly emerging (Marshall, 2002). To Marshal, various technologies deliver different kinds of content and serve different purposes in the classroom. Word processing and e-mail promote communication skills; database and spreadsheet programmes promote organizational skills; and modelling software promotes the understanding of Science and Mathematics concepts. It is important to consider how these electronic technologies differ and what characteristics make them important as vehicles for education (Berker, 1994).

Technologies available in classrooms today ranges from simple tool-based applications (such as word processors), to online repositories of scientific data. Others are primary historical documents, handheld computers, closed-circuit television channels, and two-way distance learning classrooms. Prensky (2005) asserts that even the cell phones that many now carry with them can be used to learn. According to Lei and Zhao (2006) each technology is likely to play a different role in students learning. Rather than trying to describe the impact of all technologies as if they were the same, researchers need to think about what kind of technologies are being used in the classroom and for what purposes. Two general distinctions could then be observed from the literature. Students can learn from computers where technology are used essentially as tutors and serve to increase student's basic skills and knowledge. Moreover, they can learn with computers where technology is used as tool that

can be applied to a variety of goals in the learning process and can serve as a resource to help develop higher order thinking, creativity and research skills (Reeves, 1998; Ringstaff and Kelley, 2002).

According to Murphy *et al.,* (2001), the primary form of student learning from computers is described as Discrete Educational Software (DES), Integrated learning system (ILS), Computer-assisted Instruction (CAI), and Computer-based instruction (CBI). These software applications are also the most widely available applications of educational technology in schools today, along with word-processing software, and have assisted in classroom for more than 20 years (Becker *et al.,* 1999). Murphy *et al.,* (2001) explains that teachers use DES not only to supplement instruction, as in the past, but to introduce topics, provide means for self-study, and offer opportunities to learn concepts otherwise inaccessible to students. The software also manifests two key assumptions about how computers can assist learning. First, the users' ability to interact with the software is narrowly defined in ways designed specifically to promote learning with the tools. Second, computers are viewed as a medium for learning, rather than as tools that could support further learning. As DES is recognized as the commonly used approach to computer use in student learning, in more recent years, use of computers in schools has grown more diversified as educators recognize the potential of learning with technology as a means for enhancing students reasoning and problem solving abilities. Zhang (2005) notes that this shift which has been driven by the plethora of new information and communication devices now increasingly available to students in school and at home, each of which offers new affordances to teachers and students alike for improving student achievement and for meeting the demand for 21st century skills."

Factors Contributing to Using ICT in the Classroom

Cox, Preston and Cox (1999), stated that there are a number of factors which have been identified which might influence and support teachers in using ICT in the classroom. In order to investigate these factors further in relation to teachers' ICT use, the study make use of the technology acceptance model TAM developed by Davis, Bagozzi and Warshaw (1989) which was an adaptation of theory of reason action by Ajzen and Fisbein(1980) to investigate the reasons why teachers use ICTs. Their model links the perceived usefulness and ease of use with attitude towards using ICT and actual use (system use). They tested this model with 107 adult users, who had been using a managerial system for 14 weeks. They found that people's computer use was predicted by their intentions to use it and that perceived usefulness was also strongly linked to these intentions.

Perceived Ease of Use and Usefulness

Previous studies suggests a number of factors which have been identified which relate to the perceived ease of use of ICT and a wide range of skills and competencies which teachers felt they needed in order to find ICT easy to use (Watson, 1993). Some of these factors are: regular use and experience of ICT outside the classroom, ownership of a computer, confidence in using ICT amongst others.If teachers see no need to question or change their professional practice according to TAM then they are unlikely to adopt the use of ICT. However, if they perceive ICT to be useful to them, their teaching and their students' learning, then according to the empirical evidence of previous studies (Cox *et al.,* 1999) they are more likely to have a positive attitude to the use of ICT in the classroom. Number of factors contributes to teachers' perceived usefulness of ICT. Some of these factors are: makes my lessons more interesting, makes my lessons more diverse, Gives me more confidence, and the host of others.

Teachers' attitudes to many of these factors will depend upon how easy they perceive using ICT to be on a personal level as well as for teaching in the classroom. According to Davis et al's technology acceptance model describes the more positive the responses to the above factors of perceived usefulness and perceived ease of use, then the more positive the attitudes of teachers will be to the use of ICT and the more likely they will be to use ICT in their teaching.

Methodology

Design of the Study

This study employed a descriptive survey method. This method was used to allow the researcher a vivid description of how Nigeria secondary school teachers are making use of ICTs.

Population and Sample

The population of this study comprised all government secondary school teachers in Biu Education Zone, of Borno state, Nigeria where the study was conducted. Seventeen government secondary schools were randomly selected. A census of teachers in each of the school was taken. These gave a total of 435 teachers which consists of 294 males and 141 females. Their age ranged between 25–45 years with a mean age of 35 years.

Instrument for Data Collection

An instrument tagged Teachers ICT use survey adapted from ICT survey indicator for teachers and staff by UNESCO (2004) and ICT Teachers Survey by New Zealand Ministry of Education MINEDU (1999) was used to gather data on the study. The instrument consists of two sections. The section 1 request the respondents' demographic information like age, sex, name of school, the class taught etc.

The second section contains the items. These are 10 in number. Respondents were required to respond to items 1-8 by ticking as applicable while item 9 and 10 are likert type response format in which the respondents were to choose from strongly agree, agree, neutral, disagree, and strongly disagree. To ascertain the reliability of the instrument after modification, it was administered on 35 respondents which were not part of the sample using test- retest method. The reliability co-efficient through a cronbach alpha yielded ($r = 0.84$).

Procedure

All the 435 teachers were administered the Teachers ICT use survey in their respective schools with the permission granted by the various authorities of the schools. The administration took place after the school hour in each of the school. The entire respondents were informed about the date of the exercise in advance. Out of the 435 instrument administered, only 429 were retrieved for the analysis. This translates to 98.6% retrieval

Method of data Analysis

Data collected on the study were analyzed using frequency count, percentages and mean. The results of the analysis are presented in the tables based on the research questions asked.

Research Question 1

Which ICTs do teachers have access to in their schools and what is the frequency of their access per week? The result is presented in Table 1a and 1b.

Table 1a. Teachers Access to ICTs

ICT's	No of response	%
Computers	193	45.00
E-mail	-	
Digital Camera	37	8.62
Data Projector	63	14.68
Internet	-	
Scanner	49	11.40
Interactive Response System	-	
Video Equipment	87	20.30
Total	429	100

Table 1a above shows that 193 (45%) of the teachers who took part in the study indicate computer is the type of ICTs they have access to in their schools, 87 teachers (20.3%) indicate they have access to video equipment, 63 (14.68 %) teachers indicated data projector and 37 teachers (8.63%) indicate they have access to digital cameras. No teacher indicate having access to the Internet, e-mail and interactive response system. The result indicates that respondents have access to ICTs except that they do not have access to e-mail, interactive response system and the Internet. This may be because their schools are not connected.

Table 1b. Teachers frequency of access to ICTs

Hours of Access/ week	No of response	%
0-5 hours	107	25.00
6- 10 hours	41	10.00
11-15 hours	149	34.00
16-20 hours	47	11.00
21 hour and above	86	20.00
Total	429	100

Table 1b above shows that the majority of the teachers 149 (34 %) access ICTs in their schools between 11–15 hours per week. The table also reveals that 107 teachers (25 %) access ICTs between 0–5 hours per week, only 20% of the teachers access ICTs 21 hours and above per week. This indicates that teachers have access to ICT at their various schools only that variation exists in the frequency to which they access them.

Research Question 2

What is the adequacy level of the various aspects of ICT availability/ access in respondents' schools? To answer this question respondents were asked to rate the adequacy of various aspect of ICTs availability in their schools on a five point scale. The result is presented in Table 2.

Ratings	Software	Computer hardware	Computer Consumable	ICT technical support	Internet Access	Others e.g. Data projector, digital camera etc.
Very good	28	24	29	11	0	25
Good	26	20	26	13	0	27

Satisfactory	22	17	24	16	0	28
Poor	3	12	6	30	36	8
V.poor/Non existence	2	6	2	27	40	2

Table 2 shows that computer hardware, software, consumable and others received higher rating of very good, good and satisfactory than ICT technical support and Internet access. This indicates that technical support and Internet access are lacking. This may be due to non-existence of the Internet and non-availability of ICT technician in the country generally.

Research Question 3

What are the factors hindering teachers' readiness and confidence in using ICT?

Table 3. Factors hindering teacher's readiness and confidence of using ICTs

Problems	No of respondents	%
Teachers lack of expertise with ICT	140	32.6
Lack of confidence in using ICT	26	14.5
Insufficient knowledge of appropriate software	97	22.6
Insufficient knowledge of how to use ICT equipment	41	9.6
Lack of knowledge of how to evaluate the use and the role play by ICT in teaching and learning.	125	29.1
	429	100

Table 3 shows that the most prominent factor hindering teacher's readiness and confidence in using ICT is lack of expertise (140, 33.8%). Furthermore, lack of knowledge on how to evaluate the use and role play by ICT in the teaching and learning at the secondary school level was identify as another factor by 125 teachers (29.1%). The result also reveals that 97 teachers (22.6%) indicated insufficient knowledge of appropriate software as factor hindering the readiness of using ICT.

Research Question 4

What is the teachers' perception about the perceived ease of using ICT?

Table 4. Teachers perceived ease of using ICT

S/N	**Perceived ease of use items**	SA	A	N	DA	SD	Mean	Remark
1	Using ICT makes it easier to control the class.	197	188	20	20	4	4.30	Agree
2	ICT makes the lesson more easier	183	200	18	24	22	4.29	Agree
3	ICT makes preparing the lesson more easier	202	165	26	20	16	4.21	Agree
4	Hardware and software problems often disrupt the lesson.	33	44	20	175	147	2.50	Disagree
5	Using ICT in teaching is expensive.	31	25	17	186	170	2.00	Disagree
	Grand Mean						**3.50**	

Table 4 shows that teachers agree with item 1, 2 and 3 while disagree with item 4 and 5. However, since the grand mean stood at, it means the overall implication is that the teachers perceived ICT as very easier to use in teaching their lesson.

Research Question 5: What is the teachers perception about the perceive usefulness of ICT?.

S/N	Perceived usefulness items	SA	A	N	DA	SD	Mean	Remark
1	Using ICT makes lesson more interesting.	181	157	69	12	10	4.14	Agree
2	Using ICT in teaching is enjoyable	201	170	40	11	07	4.46	Agree
3	Using ICT makes lesson more fun.	187	190	30	12	10	3.80	Agree
4	Using ICT makes lesson more diverse.	211	143	10	09	06	4.38	Agree
5	Using ICT improves presentation of materials	184	211	12	10	12	4.76	Agree
6	Using ICT makes lesson more easier	170	198	43	10	08	4.20	Agree
7	Using ICT increases students' motivation	200	150	11	12	06	3.90	Agree
8	Using ICT enhances students' learning.	180	210	16	11	12	4.25	Agree
	Grand Mean						**4.24**	

The result in table 5 shows that the teachers agree to all the statement items 1-8. The grand mean stood at indicating that the teachers perceived ICT as being useful in their lesson.

Discussion of Findings

On the issue of access to ICT, the result generally showed that aside of other identified ICTs; it's only the Internet and e-mail facilities that respondents didn't have access to. This is in agreement with the report by Gordon University Aberdeen, Scotland that teachers reported less use of the Internet and e-mail. This result may be due to the fact these facilities are not available for access or perhaps the teachers lack the skills to access them. Moreover, some government considers providing Internet connectivity in schools as being expensive and difficult to maintain.

On frequency of access, the result generally shown that a considerable number of teachers access ICT between11- 15 hours per week. This is an indication that using ICT by the Nigeria secondary school teachers is relatively high. This corroborates the report by (Gray and Souter, 2004) that teachers came out positively with regards to the use of ICTs. It also confirms the assertion that availability usually determines access. If the ICTs are available, this will motivate the teachers to access them than when they are not available or available but not insufficient quantity and quality. The study also shows that ICT technical support and Internet facility are lacking in all the respondents schools, while other facilities like hardware, software, computer consumables and other ICT equipment like digital camera and data projector are adequate and available. The report by Gordon University Aberdeen (2004) that teachers were reasonably confident in their use of ICT but felt that they needed much more in the way of support and professional development to maximize their use of ICT in the

classroom support the present findings. The lack of ICT technical support therefore may be attributed to limited number of people who are professional in the use of ICT equipment, couple with the fact that integration of ICT in the school curriculum in Nigeria and Africa generally has just begin. People just begin to develop interest in the area and take it as chosen field of study. It is assumed that at the passage of time more expert and ICT technician will begin to emerge. It should be noted that when planning introduction of new technology or when it is being used and implementing technical support or support services generally are very important. It is important to bear it in mind that it is not every user or every member of the social system where new technology is being used that have good knowledge of using the new technology. This is the more reason why support services need to be provided particularly for those who have less or no knowledge of the technology and how it works.

The finding that teacher's expertise and lack of knowledge to evaluate the use and role of ICT in teaching as the two prominent factors hindering teacher's readiness and confidence in using ICT support. Similarly, (JISC,2004) in their study on developing maturity in learning technology revealed that the most significant barriers identified are linked to staff attitude and training staff in the use of ICT, access and ICT skill in general. Moreover (Marshall *et al.*, 2003) reported similarly that staff continues to identify a lack of time as a barrier to the use of technology. While this has been interpreted to mean that staff have not have had the time to acquire the necessary skills in the use of technology in teaching, it now seems more likely that it reflects a sense of priority conveyed by the institution and a desire by academics to see a return on the investment of their time in developing their teaching delivery with technology. Previous surveys of academic staff attitudes to the use of technology have also repeatedly identified time and an absence of such examples (e.g. skills and knowledge) as significant barriers to technology adoption (Marshall, 2000).

The perception of ICT as being easier to use by teachers in this study is also relevant to the findings by Cox *et al.*, (1999). This is due to the fact that all factors teachers consider as making it easier to use ICTs was considered by Cox et al. as contributing to the continuous use of ICT by teachers in their study, and which were also found to be most important to these teachers in their teaching. The factors are: making the lessons more interesting, easier, more fun for them and their pupils, more diverse, more motivating for the pupils and more enjoyable among others. Additionally, it should be noted that in Technology Acceptance Model by (Davis *et al.*, 1989), one of the basic theme examined was perceived ease of use. This according to Davis usually influence people acceptance to use a particular technology. Hence, the result of this study actually agrees with TAM position. Teachers also perceived ICT as being very useful in this study. This may be connected to the fact that it is perceived as improving learner's performance; and more so that teachers are affected by knowledge about their own subject.

Conclusions and Implications

There is now an increasing awareness regarding the potentials of ICTs in learning. Many private and public secondary schools in the country are now infusing ICT into their teaching activities. The computers and Internet facilities in the homes of the affluent students complemented by the cybercafé proliferating the entire country have provided hundreds of thousands of Nigerian secondary school students an unprecedented opportunity to join millions of their colleagues around the globe to surf and navigate.

Meanwhile, this study has shown generally that ICT now have far reaching implications in teaching and learning at the secondary school level in Nigeria. This is because teachers

themselves have now perceived it usefulness. However, we should not forget the fact that it's not every teacher in the country today that is now applying the use of ICTs during the lesson. The need for further development and use among teachers particularly at this level is highly necessary.

Recommendations

1. Employer of teachers and teachers themselves should take advantage of the several on-going in-service training on ICT by participating with enthusiasm and partnering with organizers to expand the tenure of such training or workshops.
2. Governments should provide computers, Internet and other ICT infrastructure in all the government own schools so as to encourage teachers to use them.
3. Teacher training and professional development oriented policies should support ICT-related teaching models that encourage both students and teachers to play an active role in teaching/learning activities. Emphasis must be placed on the pedagogy behind the use of ICTs for teaching/learning. Teachers need to adopt, develop and support a pedagogic culture that develops supportive practices for students' and encourages own theories in teaching/learning activities. It should be linked to the development of life-long learning and professional practices that enable teachers to keep in touch with ICT developments, new knowledge and research on teaching/learning.

References

1. Ajzen, I. and Fishbein, M. 1980. Understanding attitudes and predicting social behavior. Englewood Cliffs, NJ: Prentice-Hall.

2. Apple Computer, 2002. The impact of technology on students' achievement. Available at:http://www.aple.com/education/research/index2.html Accessed on 10/11/2010 Bank Institute.

3. Becker, H.J. 1994. Internet use by teachers. Available at:http://www.crio.uci.edu/TLC/findings/Internet-Use/startpage.html. Accessed 12 May 2018.

4. Becker, H.J., Ravitz, J.L. and Wong, Y. 1999. Teacher and teacher directed student use of computers andsoftware. Center for Research on Information Technology and Organisations, University of California, Irvin, and University of Minnesota.

5. Beukes-Amiss, C.M. and Chiware, E.R.T. 2006. The impact of diffusion of ICTs into educational practices, howgood or how bad? A review of the Namibia situation. Available at:http://www.dspace.unam.na:8443/dspace/bitstream/1995/244/impact+diffusionICTedu pdf Accessed 10 February 2018.

6. CEO Forum on Education Technology, 2001. School technology and readiness report: Key building blocksfor student achievement in the 21st century: integrating digital content. Washington, DC: Author. Available at: http://www.ceoforum.org/downloads/report4.pdf

7. Cox, M.J., Preston, C. and Cox, K. 1999. What Motivates Teachers to use ICT? Paper presented at the BritishEducational Research Association Conference.Brighton. September.

8. Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. 1989. User acceptance of computer technology: a comparison oftwo theoretical models. Manag. Sci., 35(8): 982-1003.

9. Fowowe, S.S. 2015. Information technology: A veritable tools for sustaining the Universal Basic EducationProgramme in Africa. Paper presented at the African conference on Achieving Universal Basic/PrimaryEducation in Africa. University of Botswana, 16-19 October.

10. Gachago, D. and Mafute, S. 2007. E-learning certificate at the University of Botswana. Available at:http://www.checkpoint-elearning.com/article/3935.html, Accessed 21 May 2018.

11. Gray, D.S. and Souter, N. 2003. Secondary science teachers' use of, and attitude towards ICT in Scotland. AReport, University of Strathclyde, Glasgow, UK.

12. Hawkins, R.J. 2004. Ten lessons for ICT and Education in the Developing World. World.

13. Inwent, 2004. eLearning development and implementation: course information and documentation. Bonn: Inwent

14. JISC, 2004. Developing maturity in e-learning. Available at: http://www.aclearn.net Accessed 11 June2017.

15. Lei, J. and Zhao, 2006. Technology uses and student achievement: A longitudinal study. Computers and Education. Available at: http://www.sciencedirect.com, Accessed on 12 May 2018.

16. Marshall, J.M. 2002. Learning with technology: Evidence that technology can, and does support learning .SanDiego: State University.

17. Marshall, S. 2000. Report on the 2000 UTDC Survey of Academic Staff Needs for Teaching Technology Support.Wellington NZ, Victoria University of Wellington.

18. Marshall, S., Elgort, I. and Mitchell, G. 2003. Raising the Valleys: An Approach to Developing Staff Capability in e-Learning. Available at: http://surveys.canterbury.ac.nz/herdsa03/pdfsnon/N1123.pdf, Accessed 11June 2007.

19. McCarney, J. 2004. Effective use of staff development in ICT. European J. Edu., 27(1): 61-72.

20. Murphy, R., Penuel, W., Means, B., Korbak, C. and Whaley, A. 2001. E-DESK: A review of recent evidence onthe effectiveness of discrete Educational Software. Menlo Park, CA: SRI International.New Zealand Ministry of Education MINEDU (1999). ICT teachers'survey.
vailableat:http://www.minedu.govt.nz/web/downloadable/dl17838_vI/ict-pd-1,-ict-teacher-survey-1999.doc Accessed 10 February 2012.

21. Ogunsola, L.A. 2005. Information communication technologies and the effects of globalization: Twenty-firstcentury "digital slavery" for developing countries- Myth or Reality? Elect. J. Acad. Spec. Librarian., 6(1-2): 1-10.

22. Olakulehin, F.K. 2007. Information communication technologies in teachers training and professionaldevelopment in Nigeria. Turkish J. Dist. Edu., 8(1): 133- 142.