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Utilization of Information and Communication Technology (ICT) in Teaching among Teachers in Selected Public Senior Secondary Schools in Katsina Senatorial Zone, Nigeria

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Abstract:

This study investigated the Information and Communication Technology (ICT) Utilization among Teachers in selected Public Senior Secondary Schools in Katsina Senatorial Zone. The objectives of the study were to find out the types of ICT use; to ascertain the frequency of ICT utilization and to make recommendations with regards to utilization of ICT by public senior secondary school teachers in Katsina senatorial zone. Cross-sectional survey research method was used and the instrument used was questionnaire. The population was 1948. 30% of the population was used to draw a sample size of five hundred and eighty four (584) respondents and a total of three hundred and thirty two (332) respondents duly completed, represented 56.75%. Responses were analyzed using tables; percentage and frequency. Findings revealed that the self-trial and indoor training were major ICT program participated. The types of ICT program frequently used by teachers in public senior secondary school were computers; word processing; printers and internet. It is therefore recommended that the government in conjunction with other relevant agencies should ensure that ICTs training to teachers be done on regular bases; Awareness programs that publicize existing and new ICTs should be carried out by schools management. Sensitization forums should be organized among teachers, café/ media staff and other stakeholders on the importance and benefits of ICTs resources in teaching and learning process. Ministry of education should provide adequate power supply to the café/ media centers by using standby generators, solar energy, wind energy and inverters.

Keywords: Information and communication technology, utilization, teachers and senatorial zone

1. Introduction

Information and Communication Technology (ICT) literacy and utilization is an issue that has received the attention of researchers and practitioners for over a decade. Successful investment in technology can lead to enhanced productivity, while failed systems can lead to undesirable consequences such as financial losses and dissatisfaction among employees. Despite the significance of technological advances and increasing organizational investments in these technologies, the problem of underutilized systems plagues organizations especially public schools. All schools should be highly computerized, all teachers should obtain the skills and utilize the information and communication technology to enhance their working methods and all young people should be able to broaden their horizons. (Flanagan & Jacobsen, 2003; Totolo, 2014; Bose, 2016)

The introduction of information and communication technology (ICT) into the advanced countries was at the end of 1970's and the beginning of 1980's. The introduction of ICT into the educational system in Nigeria was expressed in terms of computer knowledge and skills required at each level of education (Tukur, 2015). This enabled the acquisition of basic skills needed to use computer in optional subject at the first stage of primary education. Based on the above, the study of ICT literacy and utilization among teachers in public senior secondary schools is very crucial.

The successful integration of information and communication Technology (ICT) into teaching and learning largely depended on the level of teacher's ICT competence, actual utilization of ICT in classroom and factors that challenge teachers to use it in secondary school teaching. Therefore, ICT is considered, nowadays, as a potential tool that provides educational opportunities in formal and non - formal ways. In the teaching and learning process, ICTs can increase the learners' motivation and engagement in classroom learning. It equips learners with inventive thinking, higher order thinking and sound reserving effective communication and high productivity (Carlos, 2014). Nigeria as a developing country is making effort to align with the developed countries in the employment of ICTs in secondary schools to enhance conventional methods of teaching and learning process. The National policy of Education as cited by Oso (2015) provided that Federal Government of Nigeria stresses that no nation can rise above the quality of its teachers so the teachers who are the vehicles through which this feat can be realized to be well informed in ICT facilities and utilization skills. ICT has become an important component of education in Nigeria. It is taught in the Primary, Junior and Senior secondary schools as a subject. However, despite effort made by Katsina State Government to promote ICT integration in senior secondary's computerization program to teachers, yet low ICT literacy continues to grapple with the problem related to ICT use in

teaching and learning by senior secondary school teachers in Katsina State. Therefore, this study therefore seeks to investigate ICT utilization in teaching and learning among teachers in senior public school in Katsina senatorial zone.

1.1. Objectives of the Study

The specific objectives of the study are:

- To find out the types of ICT use by public senior secondary school teachers in Katsina senatorial zone.
- To ascertain the frequency of ICT utilization by public senior secondary school teachers in Katsina senatorial zone.
- To make recommendations with regards to utilization of ICT by public senior secondary school teachers in Katsina senatorial zone.

2. Review of Related Literature

2.1. ICT Used in Teaching and Learning in Public Senior Secondary Schools

The use of technology in education is becoming increasingly obvious. The use of ICT is a driving force behind much of the development and innovation in both developing and developed countries as the current knowledge economy and its functions depend heavily on the use of ICT. (Tefere, Robyn and Chris, 2018).

ICT offers exciting approaches to teaching that were not even known in the past, but the extent to which the educational potential technology use can revolutionize teaching and learning and bring advances that would improve education dramatically, and students make major gains and meet greater challenges. In this report computer literacy of teachers in Sri Lanka, Amara as cited by Abba (2016) revealed that, it is a worldwide accepted fact that the use of ICT in education can bring about positive changes to the society, which requires infrastructural facilities such as electricity, telephone, educational software, Internet facilities and hardware such as computer, scanner, printers projectors and laptop computers.

Literature revealed that, to use ICT in teaching and learning process there are some basic ICT related facilities needed in public senior secondary schools. One of these facilities is electricity which is highly not impressive in our society especially at school level irrespective of its type.

Adebayo and Faghohun (2013) an assessment of computer and ICT skills among secondary school teachers in Ota, Ogun State, on the use of internet when preparing lesson notes. The result presented shows that, 51.47% surf the Internet, 42.65% don't surf Internet and 5.88% undecided. This result shows that a fairly large population of the respondents do not surf the Internet when preparing lesson note. The implication of this was that they will not have access to what the after teaching done on the current trend and best practice in their profession and method of teaching. Moreover, on the other hand the result indicates that 50% of the respondents uses spread sheet package in preparing student results, 42.65% don't use it. The researcher observed that lack of the usage may be due to the fact that spreadsheet are normally used by teachers to manage student greatest and results and not general use.

The level of ICT use and expertise by teachers in Chilean secondary schools revealed that majority of teachers (n: 74) used between 1 to 5 types of ICT with the mean of 4.45%, both primary and secondary teachers reported limited use of ICT in their teaching, with the average of two hours a week and use computer more frequently for finding information on the web for the planning lesson notes, secondary school teachers use internet for discussing ideals with colleagues and publishing teaching materials.

The constructivist epistemology which guide current thinking on the process of learning demands a shift from the traditional teaching methods which seek to transmit fixed, well - structured knowledge with a fixed external control of student, sequence and pace of learning to the teaching method which requires the teachers and student to work in different ways which include not only the use of various teaching and learning resources in the pursuit of learning. This has also led to the emergent transformation of teaching and learning resources which now include the use of different types of ICT resources like computers, compact discs, digital video discs (DVD) satellite communication and the Internet (Todd, 1999)

2.2. Utilization ICT in Teaching and Learning by Teachers in Public Senior Secondary Schools

The successful use of ICT into the classroom will depend on ability of teachers to structure the learning environment in new ways, to merge new technology with new pedagogy, to develop social active classrooms, encourage co-operative interaction, collaborative learning and group work. This requires a set of classroom management skill. The teaching skills is the ability to develop innovative way of using ICT to enhance the learning environment and encourage ICT literacy, knowledge depending and knowledge creation. Teacher professional learning will be a crucial component of educational improvement. However, professional learning has an impact only if it is focused on specific changes in teaching. (Unesco 2011).

So it is clearly that, the way ICT is used will depend on the subject being taught, the learning objectives and the nature of the students themselves. It is important to set out the basic principles which should guide the use of ICT in teaching and learning processes. (Unesco 2011).

There is need to brace up to the new challenges and systems of education through the deployment and use of ICT in Nigerian public schools. Iroha and Ekwueme (n.d) asserts that Nigeria ranks lowest among five prominent African countries in the use of ICT. The use of ICT can revolutionize teaching and learning process, and having advances that would improve education dramatically. Satharasenghe (2006) reported that having computer laboratory in public schools encourage student and teachers to use ICT in teaching and learning processes.

Nancy (2015) revealed that both primary and secondary schools teachers in Chilean secondary schools reported limited use of ICT in their teaching, with an average of two hours a week. ICT was used mainly for communicating ideas,

opinions and feelings rather than for enriching the existing curriculum or skills etc. the report also showed that secondary school teachers used computers more frequently for finding out information on the web and for planning lessons. They also use internet more frequently for discussing ideas with colleagues or publishing teaching materials. Only small number of teachers seemed to have use ICT within the personal, administrative, and teaching context.

Onasanya, Shehu Ogunlade and Adefuye (2011) reported that the extent use of ICT resources by science teachers in Nigeria as low. The overall weighted mean of 1.39 with SD of 3.2 is lower than the criteria weighted mean score of 2.50 set for high level of ICT utilization. The result further revealed that the extent of utilization of ICT of male science teacher's was higher compared to that of the female. The result indicated that both male and female teachers underutilize the ICT resources for teaching. While comparison of male and female teachers on the extent of utilization of ICT revealed that there exists a significant difference between the male and female science teachers in their level of utilization of ICTs, with the male out performing their female counterparts with higher mean scores.

Adebayo and Faghohun (2013) revealed that 51.47 percent of the respondents surf the internet when preparing for lesson notes. This implies that majority of the teachers were in touch with the research of their counterparts globally.

2.3. Problems of ICT Use in Public Senior Secondary Schools

The problems associated with the ICT literacy and uses by teachers in public senior secondary schools are quite many. This is probably mainly because of some factors, which cannot be easily controlled. Many studies have identifies the factors responsible for low use of ICT. Onasanya, Shehu, Ogunlade and Adefunye (2011) noted that most public schools lack needed facilities. Such facilities included computer laboratory, chairs, tables, packages, electricity etc. lack of funds in spite of the falling cost of computer, it is still not cheap to install in public schools and even other electronic devices, the conventional opaque projector, radio, television and video players and tapes are not available in most schools. Hot climatic condition that is absence of air condition in most schools creates problems of durability. Lack of electricity in most public schools and its irregular supply where it is available creates problems of integration of ICT in Nigerian schools. These problems hinder ICT literacy and use in public senior secondary schools in Nigeria. Evaluation and Accountability Department of Education and Training western Australia (nd) in a survey teacher and ICT skills Evaluation of the Information and communication technology (ICT) knowledge and skill level of western Australian Government school teachers, revealed that lack of computer and ICT training in the curriculum of teacher training schools, irregular visits for inspection to school at intervals by officials, ICT idolization by teachers and lack of cybercafés or media centers where listed as impediments of ICT literacy and use in public secondary schools. Iroha and Ekurueme (n.d) citing World Bank on low difficult are the science teachers in the use of ICT. The report revealed that low level of ICT education and literacy level, lack of awareness about the capabilities of the technology and absence of skills to develop and use ICT application representing significant obstacles to use even when the physical and institutional infrastructure is available.

3. Methodology

Survey method was used for this study because of its relevance in terms of efficiency and usefulness in collecting data. The population of this study consists of Public Senior Secondary Schools teachers in Zonal Quality Assurance offices in Katsina Senatorial Zone. The Zone has a total teachers' enrollment of 1948. However, literature provides that sample of 30% of the population is quite adequate for behavioral research to ensure representation of the population. This position is supported by Afolabi (1993) as a sample of 30% of the population is quite adequate for behavioral research like present study.

Therefore, a total sample size of five hundred and eighty four (584) teachers were drawn and used through stratified random sampling technique. Hence, questionnaire was employed as data collection instrument. The questions were close-ended. The close ended questions provided options itemized to help respondents provide relevant answers. The questionnaire administered personally to respondents. Data collected was coded and analyzed using frequency tables and percentages.

4. Findings and Discussions

4.1. Respondents Response Rates

Out of five hundred and eighty five (584) copies of questionnaire distributed to respondents, three hundred and thirty two (332) questionnaires were duly completed, returned and found usable for analysis, which represents 56.75%. The Table 1 below provides a survey of senior secondary school teachers in Katsina senatorial zone in Katsina state. The breakdown of the zonal offices, number of public senior secondary schools, Questionnaire Administered, Questionnaire Returned and Percentage in each zone are shown on table 1 below.

Quality Assurance Offices	Senior Secondary Schools	Questionnaire Administered	Questionnaire Returned	Percentage
Katsina	10	320	172	51.8
Dutsin-ma	06	122	74	22.3
Safana	05	49	30	9.0
Rimi	05	94	56	16.9
Total	26	584	332	100

Table 1: Respondents Response Rates

The data in table 1 above reveals that, Katsina zonal quality assurance office had 172 respondents constituting 51.8%; Dutsin-ma had 74 respondents constituting 22.3%; Rimi had 56 respondents constituting 16.9% and Safana with 30 respondents constituting 16.9%.

4.2. Educational Qualifications of the Respondents

The respondents indicated their highest level of educational qualification. Majority 172(51.8%) of the respondents had NCE/ ND as their highest level of qualification this follows by first degree/ HND 138(41.6%) and master degree with 22(6.6%) of the respondents. Figure 1 below showed the response rate based on the highest qualifications of the respondents.

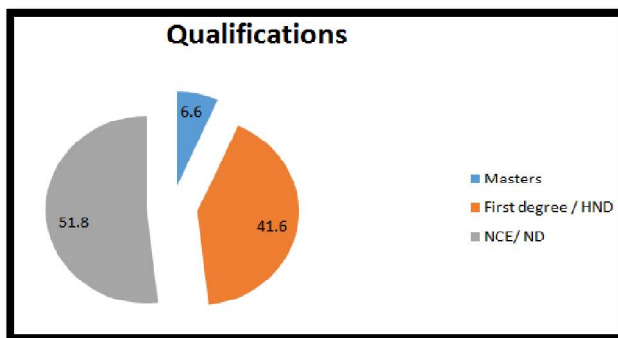


Figure 1: Academic Qualifications of Respondents

4.3. Gender of the Respondents

The respondents indicated their gender. Majority 248(74.7%) of the respondents were males and only 84(25.3%) were females. This shows that majority of teachers in public senior secondary schools under study are dominated by males.

Figure 2 below shows the response rate according to the gender of the respondents.

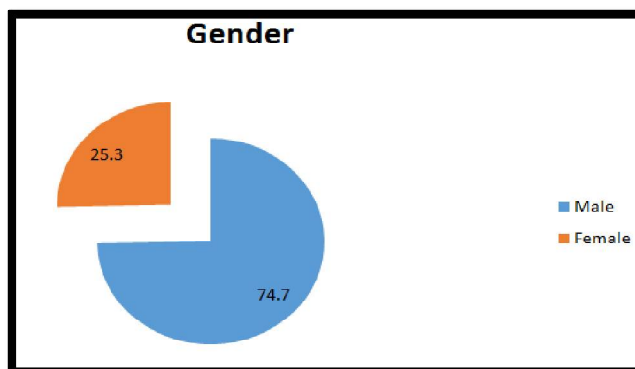


Figure 2: Gender of the Respondents

4.4. Respondents' Years of Experience

Respondents were asked to indicate the years of experience in the teaching circle. Majority 204 (61.4%) of the respondents had between 11-20 years of working experience in teaching. Followed by 72(21.7%) which had experience between 1-10 years, while 48(14.5%) had between 21-30 and only 08 (2.4%) had between 31and above year. Figure 3 below shows the response rate of the respondents based on their Years of working experience in the teaching profession.

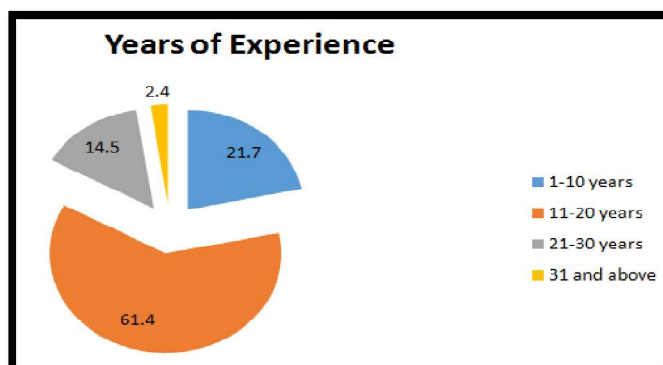


Figure 3: Respondents Years of Experience

4.5. Use of ICTs by Teachers

Respondents indicated whether they use ICTs in their teaching and learning activities. Table 2 shows the responses of the respondents as follows:

Responses	Frequency	Percentage
Yes	165	49.7
No	167	50.3
TOTAL	332	100

Table 2: Use of ICTs by Teachers

The findings in table 2 above revealed that 165(49.7%) of the respondents use ICTs in their teaching and learning activities. While 167(50.3%) of the respondents were not using it. This finding showed that all most 50% of the respondents use ICTs in their teaching and learning activities. This result implied that significant number of teachers in public senior secondary schools in Katsina senatorial zone was not using ICTs in obtaining current information when preparing their lessons. This finding is in line with that of Jones and Fox (2009) that the users of digital technologies especially by teachers were pervasive. This is true because reliance on the manual method of accessing and using information is amenable to errors, delays and dissatisfactions.

4.6. Types of ICT/Programs Used by Teachers

The Respondents indicated the types of ICTs/ Programs they use in teaching and learning activities. The respondents may choose as many as possible options depending on the once he/she are used. The table 3 shows the response rate of the respondents on the use of ICT.

Responses	Frequency	Percentage
Spreadsheet	112	33.7
Word processing	165	49.7
Presentation (power point)	45	13.6
Database Management	68	20.5
Internet	160	48.2
E-mail	103	31.0
Computer	165	49.7
Projector	46	13.9
Printer	165	49.7
Others	Nil	Nil

Table 3: Types of ICT/ Programs Used

Respondents indicated the ICTs/ Programs they used in their teaching and learning activities. The table 3 above revealed that Word processing, Computer and Printer had the highest score of 165(49.7%), Internet is ranking next with 160(48.2%), followed by Spreadsheet with 112(33.7%), and E-mail 103(31.0%) respondents as the most used from the list. This shows that teachers in sampled public senior secondary schools are familiar with Word processing, Computer and Printer, therefore can use it effectively to enhance their academic pursuits. Teachers should be able to use some types of word processing programs to perform written task and print out in a timely manner.

4.7. Reasons for Not Using ICT by Teachers in Public Senior Secondary School

The Respondents indicated the reasons for not using ICTs facilities provided. This is necessary due to the fact that, more than half of the respondents 167(50.3%) indicated the non-use of the ICT in the process of teaching and learning. Table 4 showed the response rate of the respondents on the reasons for not using ICTs facilities as follows.

S/N	Reasons	Frequency	Percentage
a.	No easy access	26	7.8
b.	Do not know how to use them	50	15.1
c.	Unsatisfactory result in the past	17	5.1
d.	Time consuming	26	7.8
e.	Not needed	02	0.6
f.	No help/ guide available	44	13.3

Table 4: Reasons for Not Using ICTs Facilities

Table 4 showed the reasons for not using ICT facilities by teachers in public senior secondary school. Majority 50(15.1%) of the respondents do not know how to use ICT provided to them, and 44(13.3%) no help available. Others are 26(7.8%) for no easy access and time consuming, unsatisfactory result in the past with 17(5.1%). The least frequency is not needed with 02(0.6%). The researchers observed that significant portion of teachers in public senior secondary schools were not ICT literate. The finding of this study is in line with the findings of Sarasvady and Khatri (2009) in their studies in

the use of ICT resources and services, which discovered that lack of adequate computer literacy was a major determining factor to hindering respondents from taking advantage and maximize their full potential of using ICT resources in teaching and learning processes.

4.8. Reasons for Using ICTs Facilities by Teachers

The researchers wanted to find out the reasons given by respondents for using ICT facilities provided to them in public senior secondary school, on multiple choice questions. Table 5 below gives some reasons for not using ICT facilities and respondents were expected to indicate what influenced their use.

S/N	Reasons	Frequency	Percentage
a.	Research/ Report	160	48.2
b.	Class assignment/ Test	90	27.1
c.	Instructional preparation	138	41.6
d.	Examination	115	34.6

Table 5: Reasons for Using ICTs Facilities

Table 5 above gives the reasons for using ICT facilities provided to teachers in public senior secondary school. It should be noted that one respondent indicated as many reasons as possible as they apply to him or her. The results revealed that majority of the respondents 160(48.2%) use them for seeking information for research purposes to update their knowledge, 138(41.6%) indicated using ICTs for instructional preparation, 115(34.6%) used ICTs for examination preparation. The least reason given by teachers for the use of ICTs was for class assignments with 90(27.1%).

4.9. Extent of Using ICTs Facilities by Teachers

The researcher wanted to find out the extent for using ICTs by the teachers. The respondents indicated the extent of their use of ICTs. The result can be seen in table 6 below.

S/N	Extent Of Use	Frequency	Percentage
a.	Always	18	5.4
b.	Frequently	87	26.2
c.	Occasionally	39	11.7
d.	Rarely	21	6.3
e.	No response	167	50.4
Total		332	100

Table 6: Extent of Use of ICTs Facilities

The result in table 6 above showed 87(26.2%) indicated the use of ICTs frequently, occasionally with 39(11.7%), 21(6.3%) teachers indicated that they rarely use them, while the least 18(5.4%) indicated always. This finding showed that majority of respondents frequently use ICTs in public senior secondary school.

4.10. Problems Associated with the Use of ICTs by Teachers

Respondents indicated the problems associated with the use of ICTs. Table 7 shows the response rate of the respondents on the problems associated with teachers' use of ICT in public senior secondary school in Katsina state.

S/N	Problems	Frequency	Percentage
a.	Lack of training on how to use ICTs	152	45.8
B	Lack of time to spend on ICTs	80	24.1
C	Lack of constant power supply	150	45.2
D	Too hard to use/ search	40	12.0
e.	Not user friendly	06	1.8
f.	Poor Internet service	120	36.1
g.	Poor supportive infrastructures	60	18.1
h.	Inadequate ICTs	110	33.1
i.	Lack of maintenance	146	43.9

Table 7: Problems Associated with the Use of ICTs by Teachers

Table 7 showed majority 152(45.8%) of the respondents indicated that lack of training on how to use ICTs, followed by lack of constant power supply 150(45.2%), Lack of maintenance 146(43.9%), Poor Internet service 120(36.1%), lack of time to spend on searching 80(24.1%), poor supportive infrastructure 60(18.1), too hard to use/ search 40(12.0), and the least is not user friendly with 06(1.8%). Therefore, the findings showed that lack of constant power supply and lack of training on the use of the ICTs are the major problems associated with the use of ICTs in the public senior secondary school in Katsina state. Many findings of past studies were in line with the findings of current study on the problems associated with the use of ICTs. Beatrice (2009) discovered that unstable power supply is the main cause for non-preference of electronic resources and services by respondents. On the other hand, Emwanta (2012) showed that

majority of the academics in three Federal Universities in the south-East of Nigeria lacked adequate training on the use of ICTs.

5. Summary of the Findings

Based on the specific objectives and data collected and analyzed for the research, the following are the summary of the major findings:

- That word processing is the major type of ICT use by teachers in selected public senior secondary schools in Katsina central senatorial zone.
- Teachers in selected public senior secondary schools in Katsina senatorial zone frequently use ICT in their teaching and learning process.
- The result showed that lack of training on how to use icts equipments and lack of constant power supply were the major setback of teachers in using icts in teaching and learning process in selected public senior secondary schools in Katsina central senatorial zone.

6. Conclusion

The following conclusions were made based on the research findings. The result of this study offered significant information on the use of ICTs by teachers of public senior secondary schools. The use of ICTs was marginal, because the benefit of ICTs in teaching and learning would not be imaginable, but not necessary lead to frequent and extensive use of ICTs in teaching processes. Furthermore, the types of ICT literacy programs obtained by teachers can also influence their level of ICTs use. Therefore, the nature of a specific ICT type needs to be considered when trying to explain the extent of ICTs utilization and research was their major purpose of using the ICTs by teachers of public senior secondary schools.

A number of problems such as lack of training on ICTs, constant power supply and maintenance are the major setback militating against the proper use of ICTs in teaching and learning process. If all these problems were addressed, teachers in senior secondary schools will be able to fully integrate ICTs in their educational process efficiently and effectively.

7. Recommendations

In the light of the research findings, the following recommendations were made.

- The government in conjunction with other relevant agencies should ensure that ICTs training to be done on regular bases.
- Awareness programs that should be carried out by schools management. Awareness and sensitization should be formed among teachers, café/ media staff and other stakeholders on the benefits of ICTs resources in teaching and learning process
- Ministry of education should encourage teachers towards the acquisition of computers, Internet and searching skills, through on the job and personal training that will prepare them to integrate ICTs in their teaching and learning.
- Ministry of education should provide adequate power to schools the by using standby generators, solar energy, wind energy and inverters.
- Government/ Ministry of education needs to determined how ICTs use affect the make-up of the physical teaching and learning condition, to ensure that ICTs training/ programs offered are those most needed by teachers to effectively handle teaching processes to their students easily.

8. Acknowledgement

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9. References

- Abba, N. U. (2016) Utilization and Challenges of Online Subscribed Databases by Academics in University Libraries in Katsina State. *An International Journal of Information and Communication (ICT)*; Volume 13 Number 2.
- Adebeyo, O and Faghohun (2013) In Assessment of Computer and ICT skills among Secondary School Teacher in Ota Ogun State, *Library Philosophy and Practice (e-journal)*. At [http://desitakcommuns. Uni. Edu/libphilpra/846](http://desitakcommuns.Uni.Edu/libphilpra/846). Accessed on March 19, 2018.
- Afolabi, M. (1993) *Introduction to Research Method for writing project and thesis*, Zaria, Alpha publishers.
- Beatrice, A. F. (2009) Challenges and Prospects of Virtual Libraries in Universities in Nigeria: *European Journal of Scientific Research* ISSN 1450-216X, 33(1) (2009), pp.202-208 on <http://www.eurojournals.com/ejsr.htm>
- Bose, K. (2016). Computer Training Programme for primary school teachers in teacher training institutions of the southern region of Botswana. *Research in Post Compulsory Education*, 9 (3), 401-416.
- Carlos, T. C. (2014). Teachers ICT literacy and utilization in English Language Teaching. *ICT & Innovation in Education*, International Electronic Journal. Volume 2, Issen 1. pp 1 – 25 at www.ictjournal.con account on 4th April 2018.
- Emwanta, M. (2012) The challenges of effective implementation of information and communication technology in universities libraries in East Nigeria, *Nigerian Libraries; A Journal of the Nigerian Library Association*, Vol. 45(2)

- viii. Evaluation and Accountability Department of Education and Training Western Australia (nd) Teacher ICT Skills: Evaluation of the information and communication Technology (ICT) knowledge and skills level of western Australian Government School Teachers. At, <http://www.det.nsr.edu.au/proflearn/der/docs/wherenow/teachict.pdf>. Accessed on 10th April, 2018.
- ix. Flanagan, L., & Jacobsen, M. (2003). Technology leadership for the twenty-first century principals. *Journal of Educational Administration*, 41 (2). 124-142.
- x. Iroha, K. and Ekwueme, O. (nd) Assessment of teacher level of literacy and attitudes towards ICT Application in Science, Technology and Mathematic Education, Calaba Metropolis [http://ascilite.org/archived-journals/e-iist/docs/vol7 no1/meltingpor/teach len lit htm](http://ascilite.org/archived-journals/e-iist/docs/vol7%20no1/meltingpor/teach%20len%20lit.htm). Accessed on March 12 2018.
- xi. Nancy C.V (2005). The level of ICT use and expertise by teachers in Chilean Secondary Schools. Paper samina presented at facultad de Education & Humanirdedes, Universided det Bio – Bio Chile.
- xii. Onasanya, S.A, Shehu R.A, Ogunlade O.O., and Adefuye At (2011) Teacher’s Awareness and Extent of Utilization of Information Communication Technologies for Effective Science and Education in Nigeria singapara *Journal of Scientific Research*, 1:49 – 58.
- xiii. Oso, S.O (2015). ICT Literacy among vocational and technical education teacher in Kogi State Technical and Vocational Colleges. *Skill Gaps British journal of Education European centre for Research Training and Development UIC.vol.3, No.5,21 – 30*.
- xiv. Sarasvady, S. and Khatri, N. K. (2009) A Study of the Use of Electronic Resources for Implementing Library Consortium: procedures and issues (ARL E-Metrics Phase 11 Report). Washington DC: *Association of Research Libraries*. [http:// www.arl.org/stats/newmeas/emetrics/phasetwo.pdf](http://www.arl.org/stats/newmeas/emetrics/phasetwo.pdf) 15/7/2009.
- xv. Satharasenghe, Accessible (2006), Computer literacy of Teachers at <http://www.stalistics.gou.ic/education/article1.Pdf>. Accessed on 10th of April, 2018.
- xvi. Tefere. T., Robyn M. G. and Chres, C (2018) Assessing the dimensionality and educational impacts of integrated ICT Literacy in higher education context *Australasian Journal of Educational Technology*, 2018, 34 (1) 88 – lat <http://ducorg/lg.14742/alect.2987>.
- xvii. Todd, R.J. (1999). Transformational leadership and transformational learning: Information literacy and the World Wide Web. *NASSP Bulletin*, 83(605), 4-12.
- xviii. Totolo, A. (2014). Information technology adoption in Botswana secondary schools and implications on leadership and school libraries in the digital age: Information leadership in a culture of change (p. 78). Erie, PA: International Association of School Librarianship.
- xix. Tukur L.M. (2015). Information Literacy and Use of Databases among Academics of Umaru Musa Yar’adua University; Unpublished MLS Theses, Bayero University, Kano.
- xx. UNESCO (2011). ICT competency framework for feachers. Version 2.0 France.