Exploring Strategies for Effective Integration of Information and Communication Technology for Teaching in Colleges of Education in North-East, Nigeria

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ABSTRACT
Integrating the utilization of ICT in teaching and learning is very important, for lecturers to improve on the technological and pedagogical knowledge to teaching ICT in Education. ICT utilization enhances student educational conception. This study identified some of the literature that discusses on the perceived barriers to ICT integration and utilization in education. The findings showed that lecturers had a strong desire to adopt the utilization of ICT in classroom; but encountered barriers such as lack of confidence, competence, and lack of access to technical assistance on new emerging ICT technology. Bridging these identified barriers make it pertinent for institutions to provide professional development training as well as appointing a well-trained technical assistance for effective coordination. However, providing all the required ICT support enhances the workability of excellent ICT integration and utilization. The study concludes with some identified recommendations that when taken might serve as a catalyst toward achieving ICT integration in colleges of Education of the North-Eastern Nigeria.
Keywords: ICT integration, instructional delivery, learning

INTRODUCTION
There is widespread interest on the use of technology for teaching in all institutions of learning in Nigeria (Afshari, et al., 2009). Emerging technology brought out the idea of integrating ICT in teaching and learning in Nigeria (Gabriel et al., 2014). This development which ICT provide to higher institution can be seen through accessibility to quality learning and how teachers make use of it for instructional delivery.
Authenticity of ICT integration can only be ascertained when teachers possess the competency to apply ICT in their teaching as to improve the presentation of the learning process (Gabriel, et al. 2014). It is pertinent to know that in this era of new technology, ICT facilities are tools necessarily needed for training of modern teachers. ICT is considered as one of the cornerstones for improving the educational system, hence the use of ICT in teacher educational institutions deserve to be given due consideration and priority, because it plays a greater role for developing prospective teachers in Nigeria (Onwuagboke, et al, 2014).
In the preparation of teachers at all levels of our educational system in Nigeria, ICT has a lot to offer in this direction. However, the usage of ICT in facilitating teacher education is still a myriad in Nigeria as many of the lecturers are not ICT literate and those under training in Colleges of Education, Institutes of Education and Faculties of Education in Nigerian universities are not fully exposed to the use of ICT in the acquisition of skills and practical teaching (Owolabi, et al., 2013). Nigeria as a developing nation is getting stronger but one "important index of strength is the quality of education provided to her citizenry" (Seweje, 2006). Now adays mostly every aspect of education in developing countries were ICT driven. The education sector in this aspect of technology still lacks behind. However, lots of energy are being

channeled by government in this direction so as to ensure effective integration of ICT in most of the government institutions.

In order to ensure successful integration of ICT in Nigeria, the Nigerian government designed its ICT policy in April 2001. The policy led to the establishment of National Information Technology Development Agency (NITDA) Act 2007 which became the legal platform for the creation and supporting all ICT implementation in Nigeria. The policy empowers NITDA to enter into strategic alliances and joint partnership and to collaborate with different sectors in the economy to realize the specifics of the country's vision of, "making Nigeria an IT capable country in Africa" (Agyeman, 2007).

ICT in education in Nigeria is one of the areas of great concern in the ICT policy. The Policy has an objective to integrate ICT into the mainstream of education and training. This includes all level of the educational institutions from the primary level to the tertiary level to implement the use of ICTs for effective instructional delivery. This National ICT Policy ensures all sectors performance and efficiency, in order to support the development goals of Nigeria's Vision 20:2020. The National Vision 20:2020 offers specific examples as to how ICT can propel development of the national socio-economic sub sector with respect to Agriculture, Oil and gas, Health, Education, Finance, Governance, Infrastructure Support, Knowledge-Based Economy, Labour Employment and Productivity, and Research and Development.

The tertiary trust fund (TETfund) created by the Federal Government of Nigeria, with its mandate to provide funding for the provision and maintenance of physical infrastructure for teaching and learning, instructional materials and equipment, research publication and academic staff development in higher institutions. In 2016 an intervention fund of over three hundred billion (₦300 billion) naira was given to Universities, Polytechnics, and Colleges of Education on infrastructure, ₦679, 057,000 specifically, was given to the colleges of education in 2016 as fund provided by TETfund for provision of infrastructure which includes the provision of ICT facilities (Paul, 2017). The Federal Government of Nigeria has put ICT and teacher education in the fore front as one of the parameters for ensuring the achievement of the Sustainable Development Goals (SDGs) which is global development in ICT in the Nigeria economy.

Despite the awareness of the importance and provision of ICT facilities in institutions, research has shown that ICT facilities in educational institutions are not effectively utilized. The consequences of non-utilization of ICT facilities led to the situation where the essence of huge government investment towards provision of ICTs in educational institutions to be less productive in the advancement of the educational system (Olowoyeye, 2016).

Research suggests that, it is not appropriate to assume that provision of ICT facilities into higher institutions can simply transforms education. Rather, we need to acknowledge the critical role played by the lecturers, on the use of these ICT facilities in the teaching process (Osborne & Hennessy, 2003). The decision of whether to use technology for instruction is mediated by lecturers' beliefs on technology and its value to instruction (Ertmer, 2005). Therefore the use of ICT by the lecturers can be made possible by the lecturers themselves making a deliberate effort in acquainting themselves with the knowledge, skills and positive attitude towards the use of ICT in their pedagogical roles. Extensive review of literature suggests two broad sources of barriers to effective utilization of ICTs in teaching. The first source comes from the lecturers themselves, and the second source comes from the leadership of the institutions. Therefore, this research conceptualizes its findings by unpacking the specific barriers that hindered effective diffusion of ICT, and also to finds out more effective ways or strategies that can support speedy utilization of ICTs in colleges of education.

Importance of ICT in Education

ICT has been the most widely emerging technology in our educational system; developing countries are in a serious demand for ICT to enhance its educational setting. ICT serve as a motivator toward building a better teaching (Flecknoe,2002; McCormick & Scrimshaw, 2001), integrating ICT in our educational System assist toward building a quality graduates who can impact greatly to the information society, especially when society is equipped with those who are willing to adopt the new tools and technology for teaching (Wagner, 2001; Garrison & Anderson, 2003). In their research, they conceptualized ICT as a tool which deepens students understanding and learning ability thereby providing students with the

contents knowledge for constructing new ideas and developing the mind for complex thinking (Kozma, 2005; Kulik, 2003; Webb & Cox, 2004). "Studies have identified a variety of constructivist learning strategies for example students who work in collaborative groups or students create products that represent what they are learning". This precisely defines the way students interact with the content knowledge (Windschitl, 2002). ICT aids in the improvement and development of quality education, it also support in building a curricular content in difficult subject areas. In achieving these objectives teachers must be given a training on the new emerging technological pedagogy, as well as on the new development of intervention and changes to new strategies, these among other should include teaching new concept and partnership with ICT. Zhao and Cziko (2001) established three necessary conditions for teachers to use when integrating ICT in their classrooms thus:

    i.   Teachers should accept efficiency of the New technology
    ii.   That by integrating technology in classroom, it has no negative effect in the society
    iii. Teachers should understand the level of control they have by adopting the technology.

Researches have shown that most teachers fail to utilises the potential of ICT and its contribution to the quality of learning, even though they accept its importance (Smeets, 2005). Haris, focuses his ICT idea on education based on Innovative and pedagogical practices (Haris, 2002). The study concludes with the fact that benefit of ICT can only be achieved when confident teachers show willingness to exploring new technology in their teaching and learning process. Consequently ICT integration will enhance learning and prepare next generation for the upcoming tools of the new technology (Wheeler, 2001).

Adopting new technology in the classroom motivates teachers to change strategically in their classroom, thereby given them the ability to understand the concept of new ICT tools for teaching (Littlejohn et al., 2002). According to Cabero (2001), "the flexibility of time-space accounted for by the integration of ICT into teaching and learning processes contributes to increase the interaction and reception of information. Such possibilities suggest changes in the communication models and the teaching and learning methods used by teachers, giving way to new scenarios which favours both individual and collaborative learning". Processing the courage to apply ICT in teaching and learning is in itself a change in this domain (Reeves & Jonassen, 1996).

ICTs as a tool for enhancing learning
Learning through the use of ICT support, can improve student wider understanding to learning approach to contextual practice (Berge, 1998; Barron, 1998). Researchers argue that any act of utilizing ICT in teaching may motivate learning and support knowledge constructivism. The more teachers explore ICT in their teaching the more visible the impact will aspire. Teachers create expressive and attractive learning skills for their students, strategically by utilizing ICT in their teaching and learning. This motivates Students learning it also provide independent enquiry which only appropriate utilization of ICT can foster. ICT integration in education defines the 21st Century technological pedagogy as a skill that might be needed in the emerging technology of the future. ICT improves the quality and accessibility of educational delivery, it also provides us with the ability for learners to access knowledge anytime and from anywhere, this defines the current situation of covid-19 pandemic which allow most schools to engage students online due to emerging pandemic that make it necessary to practice social distancing. This brought to us a new concept of how students are taught and how they learn since the new methodology are learner driven and not by teachers. This in turn would motivate the learners and also build them for lifelong learning as well as to improve the quality of learning. Technology removes temporal constraints to learning and also engages learners with special needs (Moore & Kearsley, 1996).

The important of ICT in education cannot be over emphasis because students appreciate the introduction of new technology which provides them with the support to undertake learning anywhere at any time depending on their conveniences. In 21st century ICT made a tremendous contribution in education some of which are Easy access to learning, e-books sample of past examination papers online, Facebook and other design apps for students learning available in you tubes and other educational programs specifically design to engage student's activity. With ICT one can get access to resource persons, and other experts on

all field of learning. This provided learning opportunities to many individuals who might be face with some commitment or the other (Young, 2002).

Research Questions

The research paper answered the following questions.

1. What are the lecturer's levels of technological and pedagogical knowledge needed for effective utilization of ICTs in Colleges of education in North eastern Nigeria?
2. What is the lecturer's attitude toward ICT diffusion in Colleges of Education in the North eastern Nigeria?
3. What are the types of rejection (active or passive) most dominant among lecturers in the utilization of ICT?
4. What are the kind of motivational support provide by the institution to lecturers who embraced the use of ICT in their teaching?

Hypotheses

Based on the identified research questions the following hypotheses were identified as a guide and it was tested at 0.05 level of significance.

Ho₁: There is no level of significant difference from the mean responses of lecturers on the technological and pedagogical knowledge needed for effective utilization of ICTs in colleges of education of the North eastern Nigeria.

Ho₂: There is no significance difference obtained between the means responses of lecturer's attitude of ICT diffusion in colleges of education of the North eastern Nigeria.

Ho₃: There is no significant difference between the mean responses on the types of rejection, mostly dominant among lecturers in the utilization of ICT.

Ho₄: There is no significance difference between the mean responses of lecturers on the kind of motivational support provided by the institution to those who embrace the use of ICT.

METHODOLOGY

The study employed survey research design. Creswell (2012), survey research is a form of quantitative research in which the investigator identifies the sample and the population, collects data through questionnaires or interviews while Wolman in Ezeji (2004) conceptualizes survey research as an assessment of public opinion using questionnaire and sampling method. This design was suitable since it is a research design that investigates and explores the strategies for effective Integration of Information and Communication Technology for Teaching in Colleges of Education in North-East, Nigeria.

Area of the Study

The study was carried out in the North-Eastern Zone Nigeria, the colleges of education used for data collection were located in this zone. Nigeria is divided into six (6) geo political zones. These are the North-East, North-West, North-Central, South-South, South-East, and South-West. Since the study centered its focus in the North-East, it comprises of six (6) state, Bauchi, Gombe, Adamawa, Taraba Yobe and Borno states. This area was chosen because most of the identified colleges of education are situated there, and government had invested its resources on the integration of ICT in teaching.

Population of the Study

The population of the study comprises of all the 516 lecturers in the school of science from the 10 Federal and States owned Colleges of Education in the North Eastern Nigeria. The choice of lecturers in the school of science was to limit the study to a particular population of the same characteristic in order to make reasonable classification.

Instrument for Data Collection

The instrument for data collection is Lecturers' perception on barriers to effective utilization of ICTs (LPBEUI) Questionnaire. This instrument was adapted from Centre for Educational Research Innovation (OECD/CERI, 2009) project. The project targeted teacher training institutions, teachers' trainers, student teachers and mentors. The questionnaire was developed to assess the challenges towards the use of ICT in initial teachers training institutions. The section of the questionnaire directed towards the teachers' trainer was used because this is similar to the focus of the proposed study. The questionnaire consists of

twenty-one (21) items, covering three key areas: the background information of the respondent, types of technology available and the pedagogical use of the ICT facilities. This questionnaire was adapted by adding three more sections to it, this includes access, professional development and technical support provided by the institutions to the lecturers. The questionnaire consists of six sections: Sections (A-F) section A contains Personal information of the respondents. Section B will elicit information on lecturers' technological knowledge and skills. Section C elicit information on the Lecturers' technology pedagogical knowledge. Section D focus on Issues of access to ICT facilities. Section E relates to issues of technical support of staff of the institutions. Section F covers the area of professional development of the lecturers.

Validation of the Instrument

The questionnaire was given out for validation to three experts from school of science education in the Federal college of Education (Technical) Potiskum and one in the school of education for the content validation of the instruments. Each validator evaluated the suitability of each section and appropriateness of the language used to the intending purpose. Corrections were considered and effected in the final draft of the questionnaire.

Reliability of the Instrument

Reliability refers to the degree to which an instrument yields consistent result. Cronbach's alpha method for checking internal consistency reliability was used to measure the reliability because it looks at the consistency of the score of individual items on an instrument. A reliability coefficient of 0.75 was obtained. This value indicate that the reliability of the investment is good.

Method of Data Collection

Data would be collected online using a software called the eSurvey creator. Based on the sample selected the lecturers' mobile numbers would be collected and the questionnaire would be forwarded to their mobile phone. The eSurvey Creator, is a software that helps to create a platform for administering online questionnaire. The software enables a link from the respondent mobile phone to a database that is created by the researcher using the software. When the respondent answers each question, it will automatically be registered into the database to enable the researcher to easily collect the responses and analyze them. The online method of data collection has an advantage of getting easy access to areas difficult to access due to distance and also is convenient for both researcher and the respondent.

Method of Data Analysis

The collected data was grouped according to the four research questions, the mean score was used which interpreted the answer to the four research questions identified. The numerical values of 1-5 was assigned as a pointer to response categories of the mean calculated, it is classified from strongly agree to strongly disagree. The mean response category was 3. The upper and lower limit was found to be 3.50 and 2.50. in this case any decision with the response mean case of x≥3.50 will be considered 'agree' while responses with below 3.50 will be considered 'disagree'. This was possible because 3.50 is the accepted range to lower limit of 'agree' in the response. t-test was used while analyzing the hypothesis at a significance level of 0.05. t-calculated with items greater than the table value was rejected for the null hypothesis and acknowledged if the t-calculated was found to be less than the t-table values.

RESULTS

This section deals with data analysis and presentation of results based on the data collected and were analyzed and presented based on the research questions. Two hundred and sixty-three (263) samples were distributed and 210 were collected, hence the responses are as follows;

Research Question 1: *What are the lecturers' perceptions on level of technological knowledge and skills they possessed towards effective utilization of ICTs in Colleges of Education in North Eastern Nigeria?*

Table I: Shows the mean on the Level of Technological Knowledge and Skills possessed towards effective utilization of ICTs in Colleges of Education in North Eastern Nigeria

S/N	ITEMS	SA	A	N	SD	D	$\bar{X}$	Remarks
1	I am very familiar with ICT tools	67	80	23	30	10	3.781	**Agreed**
2	I have undergone personal training on the use of ICT	20	70	23	30	67	2.743	**Disagree**
3	I have my own personal computer that I frequently used	90	50	25	20	25	3.762	**Agreed**
4	I use ICT for my personal purpose	70	84	23	20	13	3.848	**Agreed**
5	ICT enhances my work as a lecturer	81	73	20	22	14	3.881	**Agreed**
6	ICT is an important tool for teaching	87	67	18	24	14	3.900	**Agreed**
7	I am well exposed in the use of ICT facilities	13	40	58	48	51	2.600	**Disagree**
8	I am not interested in using ICT	55	50	41	54	10	3.410	**Agreed**
9	ICT is not easy to use	52	35	23	40	60	2.900	**Disagree**
10	I have no knowledge or skill on the use of ICT	22	70	33	61	24	3.024	**Agreed**

Source: Field Survey (2020)

From table 1 above, the findings of the study revealed that apart from having familiar with ICT tools, owning a personal computer, using ICT for personal purpose, work enhancement and using ICT for teaching which the respondents agreed with the views, for effective teaching and learning other items such as ease of use of ICT and regular training on the use of ICT by the lectures were disagreed based on the findings in the study area.

Research Question II: *What are the lecturers' perceptions on the level of technology pedagogical knowledge they possessed towards effective utilization of ICTs in Colleges of Education in North Eastern Nigeria?*

Table II: Shows the mean on the Technological Pedagogical Skills possessed towards effective utilization of ICTs in Colleges of Education in North Eastern Nigeria

S/N	ITEMS	SA	A	N	SD	D	$\bar{X}$	Remarks
1	ICTs facilitate my teaching	90	63	25	14	18	3.919	**Agreed**
2	I use ICTs for student teachers own development and learning	80	70	30	17	13	3.890	**Agreed**
3	I use ICTs for preparation and organization of my work	90	61	21	20	18	3.881	**Agreed**
4	I use ICTs to support various student learning style	90	60	20	29	11	3.900	**Agreed**
5	I use ICTs to support students creativity	90	70	23	11	16	3.986	**Agreed**
6	I use ICTs to support activities that facilitate higher order thinking	50	42	45	53	20	3.233	**Agreed**
7	The use of ICT saves time	86	60	22	20	22	3.800	**Agreed**
8	I enjoy using ICTs to teach	95	60	20	15	20	3.929	**Agreed**
9	I have confidence when using ICTs to teach	90	71	21	18	10	4.014	**Agreed**
10	ICTs makes my work easier as a lecturer	93	65	24	10	18	3.976	**Agreed**

Source: Field Survey (2020)

From table II above, the findings of the study show that the lecturers agreed with all the assertions presented in the research questions in the study area. This revealed that lecturers' perceptions on the level of technology pedagogical knowledge they possessed towards effective utilization of ICTs in colleges of education was positive since the mean scores ranges from 3.92 to 4.01. this signifies measuring

perceptions is effective as an indicator toward ICT integration in our colleges of education of the North-Eastern Nigeria.

Table III: Shows the Type of rejection (active or passive) possessed towards effective utilization of ICTs in Colleges of Education in North Eastern Nigeria

S/N	ITEMS	SA	A	N	D	SD	$\bar{X}$	Remarks
1	I do not know how to use ICT for teaching	30	33	17	60	70	2.490	**Disagree**
2	I do not like using ICT for teaching	27	20	30	60	73	2.371	**Disagree**
3	I do not have confidence using ICT to teach	25	22	32	61	70	2.386	**Disagree**
4	ICT is not useful to me for teaching	27	10	30	80	63	2.324	**Disagree**
5	Computer use increases my work load	40	47	30	70	23	3.052	**Agreed**
6	I find it difficult to express myself when using ICT to teach	30	37	60	70	13	3.005	**Agreed**
7	My student find it difficult to comprehend when I use ICT to teach	50	42	20	60	38	3.029	**Agreed**
8	Computer makes my work more complex	25	40	15	70	60	2.524	**Disagree**
9	Using ICT to teach is a waste of time	20	31	28	70	61	2.424	**Disagree**
10	I feel indifferent about the use of ICT to teach	72	80	15	23	20	3.767	**Agreed**

Source: Field Survey (2020)

Research Question III: *What are the lecturers' perceptions on the extent of access to ICT facilities by their institution for effective utilization in Colleges of Education in North Eastern Nigeria?*

The research questions instrument was addressed by items 1-10 of table III, the analysis showed that most lecturers disagree with the fact of the general perfection that they rejected ICT utilization in their teaching. However, it was slightly observed that the fear was due to student inability to comprehend all lectures presented with ICT integration. This is because items in tableIII that sought to measure lecturer's rejection to ICT integration were disagreed, instead they showed willingness to using ICT and that ICT benefits them the most. This truly presents the fact that lecturers do not reject ICT integration, but only reflecting on the study of Gardener and Milton (2002), Iyamu and Aduwa (2005) which conceptualizes on the critical questions that lies on how students results will be thoroughly evaluated.

Table IV: Shows the mean on the Technical Support and Professional Development possessed towards effective utilization of ICTs in Colleges of Education in North Eastern Nigeria

S/N	ITEMS	SA	A	N	SD	D	$\bar{X}$	SDev	Remarks
1	The institutions repairs damaged ICT facilities	31	29	80	60	10	3.052	1.747	**Agreed**
2	The institution provides steady power supply	27	33	70	70	10	2.986	1.728	**Disagree**
3	The institution has ICT technician to assist lecturers	21	27	72	70	20	2.805	1.675	**Disagree**
4	The ICT laboratories are conducive for teaching and learning	33	30	76	60	11	3.067	1.751	**Agreed**
5	Regular maintenance are carried on the ICT facilities	25	31	84	60	10	3.005	1.733	**Agreed**
6	The institution conducts in-service training for staff on use of technology.	30	39	85	44	12	3.148	1.774	**Agreed**
7	The institution conducts ICT, seminar, and workshops on the use of technology for teaching.	29	37	80	54	10	3.100	1.761	**Agreed**
8	The institution conducts relevant seminar on new technologies provided.	28	33	89	40	20	3.043	1.744	**Agreed**
9	The institution provides on-the-job training on ICTs for staff.	33	66	41	50	20	3.200	1.789	**Agreed**
10	The institution does not provide any form of training for staff.	80	50	13	50	17	3.600	1.897	**Agreed**

Source: Field Survey (2020)

Research Question IV: *What are the kind of motivational support provide by the institution to lecturers who embraced the use of ICT in their teaching?*
Table IV indicated that all items from 1-10 had their mean score between 3.052 and 3.600, this indicated that the respondents agreed to all items as important that the institution provided all the necessary technical support and professional development for the successful integration of ICTs.

DISCUSSION
The findings identified that the respondents agreed on the integration and utilization of ICT in our colleges of education. This was observed because of the level of importance attached to the teacher's readiness to adopt ICT usage in their teaching and learning process. The study conceptualizes that employing modern technology in our classroom enhances teaching and learning (Lefebve, Deaudelin and Loiselle, 2006). Dawes (2001) reported new technology as a catalyst that enhances educational learning across the curriculum. The report is a wakeup call to lecturers in colleges of education in the North-Eastern states to build a stronger confidence toward adopting ICT in their teaching and learning activity. The study identified availability and access to ICT resources what kind of fear develop by lecturers when it comes to utilization? Most of the lecturers do have the zeal of using ICT in the classroom, but however, require a technical assistant to serve as a guide for keeping them with up-to-date ICT tools a new design idea for the emerging technology. The study conceptualizes its findings on the research of Bransford et al. (2000) and it said "What is now known about learning provides important guidelines for uses of technology that can help students and teachers develop the competencies needed for the twenty-first century" (P.266).
From the study it was found out that 10 items that discusses on the lecturer's perception of lecturers rejection to ICT utilization as either (Active or Passive) were rated disagree by the respondents, this discusses the behavioral perception of ICT utilization by the teachers of colleges of education in the North-eastern Nigeria. The findings among others includes, knowing how to use ICT, how often do lecturers use ICT, in classroom teaching, what confidence do they drive while utilizing ICT, how easy due students comprehend ICT lesson presentation in the classroom? This truly measure perceptions as either active or passive. The findings were in agreement with the opinion of (Pelgrum, 2001) Pelgrum said the material condition that measure perception depends on the available number of computers or copies of educational software. He elaborated his points as the non-material obstacles which includes teacher's insufficient ICT knowledge and skills as well as the difficulty of Integrating ICT and insufficient ICT knowledge and skills as well as the difficulty of integrating ICT and insufficient teacher time.
The findings on the study on the level of technical support and professional development possessed towards effective utilization of ICT in colleges of education in the North-Eastern Nigeria. From the instrument recorded it was shown that 10 items that discusses on the instructional motivational strategy was rated agreed. Thus, the study concludes that the concerns institutions on the study area provide all necessary support as it affects training and other professional development. The lack of time is not an excuse to teachers this speaks the notion that technical equipment was available but there is no time for the teacher to operate and practice all the technicalities, this could be due to unfavorable lecture periods or an insufficient class time. Many literatures visited argue that lack of teacher training discourages ICT utilization and integration into education. ICT related tool might be available in schools but implementation strategically may not succeed if the lecturers do not have the proper pedagogical and technological training or skills on how to use the ICT resources at their disposal. The study concludes with the assertions that not only access to ICT tools in schools that matters but access to it operational concept at home also plays a greater role in making a lecturer fully familiar with the concept of ICT utilization and implementation.
The relationship that links access to modern ICT tools, training, teacher's competence, confidence and positive attitude towards ICT Integration strategically is the main panacea needed to implement the findings of this study. Nwachukwu et'al. (2009) "when tools and equipment are properly coordinated, the results will be the product of efficient, effective and employable graduates". The views of experts cited

above go a long way in justifying the findings of the study in exploring the strategies for integrating ICT in teaching in colleges of education in the North-Eastern states.

From the study it was found that there was no significance difference in the mean ratings of the responses of lecturers of colleges of education as it affects perception, rejection and motivation for effective implementation of ICT in education. Therefore, the null hypotheses has no significant difference in the mean ratings of the respondent, and so were upheld. The implication of this findings is that it helped to validate the findings on the section I,II,III IV & V and also it implied that the qualification and professional experiences of the respondent had no significance influence on their opinion, this as it affect planning organizing, controlling and coordinating strategies needed to integrating ICT utilization in colleges of education in North-Eastern Nigeria.

CONCLUSION

Integrating ICT utilization for teaching and learning is widely dependent on training and professional development. The ICT resources are poorly managed, coordinated and this badly affected the integration of ICT for teaching and learning in colleges of education.

The study was guided by four research questions. The first research question focused on measuring the lecturer's level of technological and pedagogical knowledge. The second research question explored how the lecturer's beliefs attitudes and behavioural interest to using ICT were enacted in the integration and implementation process. The third research question measured perception which defines level of acceptance and usage while the fourth research question focused on the institutional motivations and training, support for professional development and ICT implementation.

Data was collected using questionnaire this was then analysed using statistical package such as SPSS, this helps the policy makers to formulate on any informed decision when designing and implementing the needed strategy invariably identified.

With respect to the first research question findings generally indicated that lecturers believed that utilizing ICT in teaching would be achieved without great effort. However, despites lecturers perceived ease of use, it was observed that they are yet to understand the ICT affordances and frequent use of ICT enhances learner conception. The lecturers did not understand that using ICT along could not bring the needed changes for integration and implementation rather by learning the needed technological and pedagogical knowledge of the new emerging ICT technological teachings. The findings of the study showed that the institution provides ICT laboratories for teaching ICT related matters, but fails to provide lecturers with pedagogical use of ICT in teaching Science related courses. Generally, lecturers did not show their readiness to using ICT because they were not familiar with the technological facilities available. They could not optimize the utilization of the technology because they lack the technological skills.

Findings also showed that utilizing ICT resources did not motivate the lecturers but also encouraged the learners to learn. The implementation of ICT in schools reinforced the conceptualization to teaching and learning in colleges of education, and this facilitated the involvement of all the stakeholders to learn at the same time.

The study concludes with the presentation on the needs for institutions to provide the needed ICT technological and pedagogical training to lecturers for effective integration of ICT in schools.

Finally, the study therefore, made the following contribution to knowledge and a strategy for effective implementation of ICT in colleges of Education in North-east Nigeria.

1. It has provided information to lecturers on the needed technological and pedagogical knowledge as a strategy both for teaching and learning ICT.
2. It has provided information to National Commission for colleges of Education on Strategy for managing and controlling ICT resources which they could incorporate into the curriculum of technical teacher Education.
3. It has identified information on ICT material resource management by appointing well trained technical assistance to support the lecturers in utilizing ICT related teaching strategy.
4. It has provided an information strategy to institution for proving an institutional centred learning in colleges of Education of the North-Eastern Nigeria. The information could be by packaging

ICT related resources for workshop and other ICT related tools for improving the competencies of the lecturers concerned.

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