



## **Integration Of Information And Communication Technology (ICT) As A Tool For Enhancing Teachers Effectiveness In Colleges Of Education In Northeast, Nigeria**

<sup>1</sup>Musa Umar Babi & <sup>2</sup>Duchi Abba Kyari

<sup>1</sup>Department Of Curriculum and Instruction  
Federal College of Education (Tech) Potiskum, Nigeria  
E-mail: [jarmajatau@gmail.com](mailto:jarmajatau@gmail.com)/08032602656

<sup>2</sup>Department Of Curriculum and Instruction  
Umar Suleiman College of Education Gashua, Nigeria  
08067695317

### **ABSTRACT**

This study determined the effects of Integration of Information and Communication Technology (ICT) as a Tool for Enhancing Teachers Effectiveness in Colleges of Education in Northeast, Nigeria. Two objectives and two research question and hypotheses guided the study. Three Federal Colleges of Education in the North-East were selected for the study using purposive sampling technique. Proportionate sampling technique was used to distribute the sample across the three colleges. The instrument used for the data collections was the researcher-designed questionnaire titled Questionnaire on Integration of Information Communication Technology (ICT) as a Tool for Enhancing Teachers Effectiveness in Colleges of Education in Northeast, Nigeria (QIICTTFETECENEN). The instrument was subjected to face and content validation. This study confirmed that, lecturers perceived the usefulness of ICTs as very useful and effective tool that will enhances productivity and efficiency of teaching and learning. However, the study discovered that there are some challenges to the effective integration of ICT resources in content delivery by the lecturers in FCE. The study recommended that; There is a need for the Government through the National Commission for Colleges of Education (NCCE) and other Education stakeholders to respond positively and provide enough ICT infrastructures to all the FCE across the country so as to encourage lecturers to utilize them in their teaching.

**Keywords:** Information and Communication Technology (I.C.T), Teachers Effectiveness, Integration, College of Education, North-East

### **INTRODUCTION**

The rapid growth in Information and Communication Technology (ICT) especially Internet and the social media has brought remarkable changes in the society in twenty-first century in terms of new ways of teaching, learning, research and commutation, (Buabeng-Andoh,2012). Computers and network technology have influenced a range of societal and cultural aspects of life as well as individual

experiences having different lifestyles, thinking styles, ways of working and new communication patterns compared to previous societies (OECD, 2010). Technologies can enhance the teaching/learning process by reforming conventional delivery systems, promoting quality of learning achievements, facilitating state-of-art skills formation, sustaining lifelong learning, and improving institutional management (Gusen, and Ibrahim, 2021). ICT is becoming increasingly important in society's daily lives and in educational system. Sudiran (2016), claimed that Internet plays an important role in the learning reading course. The growing demand on educational institutions to use ICT to teach the skills and knowledge that students need in their workplace and in everyday life is a welcome development. In respond to the yearning for ICT literacy and competency in Nigeria, the educational institutions are trying to restructure their educational curricula and classroom facilities in order to bridge the existing technology gap. It can be applied as learning media from which students may use it to expand their reading skills at university to bridge technology gap in teaching and learning processes.

Many colleges choose an ICT that will work well with their equipment and give teachers and students a pleasant experience in the classroom (Babate & Jakwa, 2021). Utilizing ICT boosts performance, allows for visual observation, improves perception, and speeds up learning (Ibode, and Olamigoke, 2018). Through creative labor, parents at home assist in preparing students. They also research fascinating subjects online. Lawrence and Tar (2018) claim that when ICT is used in the teaching process, teachers act as assistants and instruct students as they do their assignments. There is a chance for improved communication between instructors and students. Students can use the Internet to create presentations or other projects and to create quizzes for school.

Lopez, Arriaga, Álvarez, González, ElizondoLeal, Valdez-García and Carrión (2021) opine that ICT may enhance, supplement, and better the educational process. As the leading United Nations organization for education, UNESCO directs global initiatives to assist nations in comprehending the part that such a technology may play in accelerating progress towards the Sustainable Development Goal 4 (SDG4), a goal encapsulated in the Qingdao Declaration (Jack, 2021). It is crucial that we change the way we teach today because technology has impacted almost every aspect of our lives. Additionally, because new learning theories have emerged, teachers are now expected to facilitate learning and make it meaningful for each student, rather than just imparting knowledge and skills (Agyei, 2021). The conventional teaching-learning paradigm has undergone a significant change as a result of ICT, an emergent technology. Qaddumi, Bartram, & Qashmar, (2021) maintain that, incorporating ICT facilities into teaching and learning has given teachers and student teachers more authority to provide a more effective and efficient education, which has severe consequences for the nature and purpose of educational institutions. In terms of pedagogy, lesson preparation, online lesson integration, lesson assessment, research, and teachers' professional development, using Google Suite and smart boards has improved teaching and learning tremendously.

### **Statement of Problem**

Information and Communication Technologies (ICTs) offer innumerable potential in enhancing the quality and quantity of teaching and learning in tertiary institutions. It has been observed that effective utilization of ICT transforms the way education is delivered and promotes new opportunities, therefore, enhancing scholarship and competencies. This can only be attained when facilitators and students are exposed to their use in the course of teaching and learning. The problem of this study therefore is that there is need for an empirical finding on the Integration of Information Communication Technology (ICT) as a Tool for Enhancing Teachers Effectiveness in Colleges of Education in Northeast, Nigeria.

### **Significance of Study**

The purpose of this study was to identify the various means in which ICT can enhances effectiveness of teaching and learning in colleges of education in North-East Nigeria. Among other things the study seeks to find the effects of ICT access and use on: Quality of teaching and learning and Quality of research and development. It is believed that the study will add to body of literature advocating the use of ICT in Nigerian educational system especially in the Colleges of Education. The research findings will intimate the Federal Ministry of Education, National Commission for Colleges of Education, Management heads, and all stakeholders of colleges of education on the benefits of investing in ICT infrastructure, training

and integration into teaching and learning. It is hoped that the results of this study will guide policy makers in intensifying their support and push for not just ICT policies but the real implementation on campuses of colleges.

### **Objectives of the Study**

The objective of this study is to determine:

1. Effects of ICT on the quality of teaching and learning in colleges of education in North-East Nigeria?
2. Effects of ICT on the quality of research and development in colleges of education in North-East Nigeria?

### **Research Questions**

The following research questions guided the study

1. What are the effects of ICT on the quality of teaching and learning in colleges of education in North-East Nigeria?
2. What are the effects of ICT on the quality of research and development in colleges of education in North-East Nigeria?

### **Hypotheses**

The following null hypotheses were tested at 0.05 level of significance

H<sub>01</sub>: There is no significant effect of ICT on the quality of teaching and learning in colleges of education in North-East Nigeria.

H<sub>02</sub>: There is no significant effect of ICT on the quality of research and development in colleges of education in North-East Nigeria.

## **LITERATURE REVIEW**

Information and communication technology integration is defined as the use of ICT resources (such as the internet, e-learning technologies, and CD Roms) to support teaching and learning (Jegede, Ebio and Iroegbu, 2019). Asubiojo and Aladejana (2019) argues that ICTs can now serve as a justification and a tool for advancing both old and new educational aims that have eluded us for a long time. Technology will be more beneficial than harmful if sufficient resources, careful effort, and patience are invested. ICT integration, according to Garba, et. al., (2018), is the process of introducing, reinforcing, enhancing, and extending capabilities.

Digital technologies have spread rapidly in many parts of the world (Cenamor & Frishammar, 2021) and are affecting the way we learn, live and do business. Digital technology have frequently accelerated growth, increased opportunity, and enhanced service delivery. Their combined influence, nevertheless, has been insufficient and unevenly dispersed (Selwyn & Heffernan, 2021). To effectively integrate ICT, all nations regardless of economic standing must acknowledge the trend toward pervasive use of ICTs. This calls for learner-centered attitudes and values. Schools today employ a wide range of ICT resources to communicate, produce, distribute, store, and manage information. (A'mar and Eleyan, 2022).

ICT has in some contexts also become crucial to the teaching-learning interaction through strategies like switching from chalkboards to interactive digital whiteboards, using students' own smartphones or other devices for learning during class time, and the flipped classroom model, where students watch lectures at home on the computer and use class time for more interactive exercises. The use of ICT by teachers who are digitally literate and trained can help students develop higher order thinking skills, give them unique and creative ways to express what they have learned, and better prepare them to deal with ongoing technological change in society and the workplace (Iyamu, et. al., 2019). Arkorful et al. (2021) believe that by using ICT, students are able to make content that builds upon and refers to sources that are more in-depth than those found in textbooks for the classroom. The internet helps teachers stay up to date on best practices and create lessons that provide pupils the chance to study more deeply. Students can produce a document, film, podcast, or presentation that indicates a stronger comprehension of their subject matter after receiving the right teaching(s).

Gikundi (2016) examined the variables impacting the integration of information and communication technology in learning and teaching. All of the public secondary schools in Tigania West Sub County,

Meru County, were the study's intended audience. It used a descriptive survey research methodology. 14,444 people were the study's target population, including 400 teachers, 44 head teachers, and 14,000 students. The study's conclusions showed that three elements access to ICT infrastructure, teacher proficiency, and technical support had a substantial impact on how ICT was integrated into teaching and learning in the sampled schools. The study came to the conclusion that teachers face difficulties in successfully integrating technology into lesson plans. Teachers' use of ICT in teaching and learning is influenced by their training, expertise, and skills in the field. Lack of ICT infrastructure, outdated or badly maintained hardware, a lack of appropriate instructional software, restricted access to ICT, and spotty or nonexistent internet connectivity were all identified to be obstacles to ICT integration.

Asana, Irabor, Seppo, Jean, Ngoma, Elzawayy, and Ngwa (2021) noted in their study on the use of ICT in education that while ICT is advancing in developed western nations, its use in education is still lagging in Africa and other developing nations. However, despite being in the early stages, a survey on ICT usage in South African schools found that the country had made substantial strides toward the integration of ICT in classrooms. In light of these findings, Ghana has made progress through the Ministry of Education in recognizing the role played by ICT in education, noting that a nation needs an ICT literate workforce in the current globalized economy to increase its participation in the knowledge economy.

Boahen and Atuahene (2021) examined the effects of ICT integration in Kumasi High Schools, Ghana—Teachers' and Students' perspective. According to the study, information and communication technology (ICT) has a wide range of educational applications and is influencing education by altering the teaching and learning process. By incorporating ICT into their teaching and learning processes, schools are working to take use of its potential. The study's conclusions showed that while the majority of teachers had a strong desire to include ICT into teaching and learning, there were a number of issues and difficulties with doing so in schools. The study also identified internal hurdles linked to teacher cognition and external barriers related to teacher access to ICT, environmental supports, and ICT literacy.

## **METHODOLOGY**

The study adopted the descriptive survey method since it helped to sample the opinions of both the students and the teachers on teacher's effectiveness as a result of ICT integration. The population consists of staff and students in Federal Colleges of Education in the North-East. The sample size of three Federal Colleges of Education in the North-East were purposive selected. Consequently, a sample size of 40 staff and 250 students was randomly selected. The instrument used for the data collections was the researcher-designed questionnaire titled Questionnaire on Integration of Information Communication Technology (ICT) as a Tool for Enhancing Teachers Effectiveness in Colleges of Education in Northeast, Nigeria (QIICCTTFETECENEN). The instrument was subjected to face and content validation. The reliability of the instrument was also determined using Cronbach alpha. The questionnaire was used to gather data from both staff and students of the sampled colleges of education in the North-East Nigeria to elicit answers for the research questions. The data obtained were analysed using descriptive and inferential statistic tool with the aid of Statistical Package for Social Sciences (SPSS) version 27.

## RESULTS

Research Question 1: *What are the effects of ICT on the quality of teaching and learning in colleges of education in North-East Nigeria?*

Items 1 to 7 on the questionnaire guided the analysis for this question. The result is as presented in Table 1

**Table-1.** Mean of response of staff and students on the Effects of ICT on the quality of teaching and learning.

Items	Statements	$\bar{X}$	Average $\bar{X}$	Decision
1	ICT enhances the quality of students' learning	3.75	3.70	Accept
2	ICT ensures access to quality education by disable student	3.78	3.55	Accept
3	ICT improve overall performance of students	3.62	3.51	Accept
4	ICT helps in preparing students for self-reliance	3.67	3.58	Accept
5	ICT increases effectiveness of students record management	3.20	3.24	Accept
6	ICT help in making teaching learning more interesting.	3.37	3.46	Accept
7	ICT helps in making teaching-learning more effective.	3.48	3.53	Accept

Grand mean  $\bar{X} = 3.51$

The researchers adopted the decision rule made up of rejecting items whose score is less than 2.5 and accepting those whose mean is 2.5 and above. Table 1 data shows the grand mean score of 3.51 which is greater than 2.5. This shows that both the staff and students agree that ICT have effects on the quality of teaching and learning, educational generally and academic performance to a large extent.

Research Question 2: *What are the effects of ICT on the quality of research and development in colleges of education in North-East Nigeria?*

Items 8 to 19 on the questionnaire guided the analysis for this question. The result is as presented in Table 2

**Table-2.** Mean staff and student responses on the effects of ICT on the quality of research and development.

Items	Statements	$\bar{X}$	Average $\bar{X}$	Decision
8	ICT enhances quality to work of both teachers and students.	3.40	3.53	Accept
9	Will expand opportunity for collaboration	3.00	3.13	Accept
10	Widen the scope of research	3.76	3.75	Accept
11	Enables academic staff use of internet	3.84	3.84	Accept
12	ICT enhances quality of work of both teacher/students	3.80	3.70	Accept
13	ICT makes teachers to be up to date in their various disciplines.	3.78	3.59	Accept
14	ICT enhances efficiency of workers.	3.72	3.61	Accept
15	ICT helps teachers to share information with colleagues in other parts of the country.	3.92	3.60	Accept
16	ICT helps student to share information with colleagues in other parts of the country.	4.56	4.03	Accept
17	ICT Literacy should be a criterion for employment	3.06	3.29	Accept
18	Integration should be encouraged	3.38	3.43	Accept
19	Will improve staff enthusiasm for research and writing	4.00	3.45	Accept

Grand mean  $\bar{X} = 3.598 = 3.60$

Table 2 shows that the grand mean of 3.60 is greater than 2.5. This means ICT has a wide range of effects on research and development.

**Hypotheses Testing**

Hypothesis 1: There is no significant effect of ICT on the quality of teaching and learning in colleges of education in North-East Nigeria. The result is presented below in table 3.

**Table-3.** T-test on the responses of staff and students to the effect of ICT on the quality of teaching and learning

Group	N	$\bar{X}$	$\bar{x}$	SS	t-cal	t-critical	Decision
Staff	40	679	17	77687	0.003	1.960	Accept HO
Students	250	4150	16.6	2045510			

df=288

**Legends**

df = degrees of freedom

N = Total number of respondents  $\bar{X}$  = No. of responses

$\bar{x}$  = mean of responses SS = Sum of Squares

Hypothesis 2: There is no significant effect of ICT on the quality of research and development as perceived by staff and students of the selected colleges of education in the North-East Nigeria.

**Table-4.** T-test on the responses of staff and students to the effect of ICT on the quality of research and development

Group	N	$\bar{X}$	$\bar{x}$	SS	t-cal	t-critical	Decision
Staff	40	1684	42.1	236948	0.007	1.960	Accept Ho
Students	250	11030	44.12	9480700			

df=288

Table 4 shows that the value of t-calculated 0.007 is less than the t-critical value 1.960. Thus, the null hypothesis that states that there is no significant effect of ICT on research and development was accepted.

**DISCUSSION OF FINDINGS**

The study clearly highlighted that, it is impossible to underestimate the effect of ICT on the research, teaching and learning process in colleges of education in North-East Nigerian educational system. This study has agreed with the views of Baba (2014), Agbetuyi and Oluwatayo (2012), and Yusuf (2005). They all agreed that ICT use plays a vital role in effective and efficient delivery of education. Similarly, through this study, it was discovered that the opinion of the staff and students of the colleges of education in North-East, Nigeria is consistent and their desire to have unrestricted access to internet facilities and general technology resources is important to the improvement of research, development, and teaching and learning. Responses to items 8 to 27 on the questionnaire indicated that access to technology exposes students and lecturers to more and diverse research materials, encourages collaborative research efforts, reduces plagiarism on research projects, encourages and increases journal publication efforts, widens potential research topics, makes students more inventive, intuitive, creative, and proactive in their thinking thereby increasing their confidence in their research ability.

**Implications of Study**

The implication of this study is that investing in ICT resources, funding ICT programs, supporting training and professional development in ICT is important to the educational systems and future economic growth of manpower in Nigerian. The socio-economic development of the world today cannot be clearly detached from technology use. To ignore funding and use of technology in Nigerian educational system therefore is to stagnate potential economic development.

**CONCLUSION**

This study confirmed that, lecturers perceived the usefulness of ICTs as very useful and effective tool that will enhance productivity and efficiency of teaching and learning in colleges of education in North-East, Nigeria. This finding might not be unconnected with the fact that the lecturers know the importance

inherent in the use of ICT in the teaching and learning. It has been discovered that the usage of ICT causes a paradigm shift in the conventional beliefs and approaches to the teaching and learning process in colleges of education in North-East. According to the study's findings, some of the common advantages of ICT in education include: shifting from teacher-centered instruction to learner-centered instruction, which helps students become independent and self-directed in the acquisition and application of knowledge and skills; putting the emphasis on learning rather than teaching, which makes the learning environment for teachers and students more dynamic and engaging; and empowering students to take more responsibility for their education as they seek out independent learning opportunities, transforms lecturers' roles from merely knowledge transmitters to learning facilitators, knowledge navigators, and active co-learners with students. However, the study also found that the lecturers in FCE are not well exposed to some of the ICT resources in their content delivery. Therefore, there were a lot of challenges to the effective integration of ICT resources in content delivery by the lecturers in FCE.

### RECOMMENDATIONS

1. There is a need for the Government through the National Commission for Colleges of Education (NCCE) and other Education stakeholders to respond positively and provide enough ICT infrastructures to all the FCE across the country so as to encourage lecturers to utilize them in their teaching.
2. There should be teacher training programmes and skill development of teachers that will encourage them to have the requisite skill, competence and exposure to enable them to be more proficient in the utilization of ICTs in teaching/learning activities. The Government can do this by partnering with other organizations to provide training and the tenure of such training or workshop should be periodically.
3. Emphasis should be given to the pedagogy behind the utilization of ICTs for teaching/learning activities.

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