International Journal of Multidisciplinary Research and Publications
ISSN (Online): 2581-6187

Information and Communication Technology (ICT) Competence and Teaching Effectiveness of Lecturers: A Case Study of Public Polytechnics in Ekiti and Ondo States, Nigeria

William, Kayode[1]; Isaruk, Ikpoko-ore-ebirien Dike[2]; Ajagunna, Adedayo Emmanuel[3]; Ada, Gaius Ph.D[4]; Wosa, Sylvanus A.[5]

[1-3]Department of Information Resources Management, Babcock University, Ilishan-Remo, Ogun State, Nigeria. 110001
[2,4-5]School of Health Information Management, Rivers State College of Health Science & Management Technology, Port Harcourt, Nigeria. 500001

***Abstract*—** *In the twenty-first century, it is expected that teaching delivered to students in tertiary institutions, particularly in polytechnics, will be effective. In most of the world's nations, including Nigeria, effective teaching with teaching methodologies, content knowledge, classroom management, and assessment procedures along with lecturers' basic, intermediate, and advanced Information and Communication Technology (ICT) competencies has been a challenge. A case study of public polytechnics in the Nigerian states of Ekiti and Ondo was used in this study to examine lecturers' competence in ICT and their effectiveness as teachers. Data was gathered using a survey design and a self-structured questionnaire. Mixed method sample strategies (Purposive, Systematic, Stratified, and Convenience) were utilized to select 6 faculties, 12 departments, and to administer the questionnaires in the 3 public polytechnics. There were 449 participants in the sample and 1,992 people overall. 422 of the 449 questionnaires that were given to respondents in the institutions were retrieved. Descriptive and inferential statistical methods were used to analyze the data. The outcome showed that lecturerrs at public polytechnics in the Nigerian states of Ekiti and Ondo had a modest degree of ICT proficiency ($\bar{x}$ = 2.85). ICT proficiency has a favorable but negligible impact on the effectiveness of teaching in public polytechnics in the two States (β =0.133, t = 1.735, p>0.05). The study demonstrated that ICT competence is a requirement for public polytechnic teaching effectiveness in Ekiti and Ondo States. In order to assure the availability of various ICT facilities in their institutions for use, the researchers advised that the various heads of public polytechnics in the states of Ekiti and Ondo as well as Nigeria generally should ensure the provision of various ICT facilities for use by their lecturers.*

***Keywords*—** *Effective Teaching, Ekiti, ICT Competence, Lecturers, Public Polytechnics*.

I. INTRODUCTION

Every country in the world works to raise the standard of teaching in its higher education institutions. Any higher education institution, including public polytechnics, needs lecturers. Lecturers serve a variety of important roles around the world, including teaching, advancing students' academic performance, and promoting societal development (1). (2) defines teaching as all the activities a teacher engages in while imparting knowledge to children in order to help them become morally upright and productive adults. According to (3), teaching is the process by which young students are prepared to be technically oriented, trained to become the architects of technical policies, and enforcers of technology growth in Nigeria and other countries. This is done in the context of Nigeria's public polytechnics. (4) Defined a polytechnic as a higher education institution created to train and develop middle level professionals in a variety of subjects in the business, technological, and academic sectors. The author went even farther, conceptualizing polytechnic education as the kind of education that gives students a structured introduction to technology and also incorporates their experiences into the development of organized knowledge. Teachers occasionally engage in effective teaching at various educational levels around the world to fulfill this crucial job of educating pupils on societal growth.

According to (5), effective teaching is the process by which a teacher imparts knowledge and ideas to the pupils while assisting them in developing their own personal capacity to supervise and direct such knowledge and ideas towards fruitful endeavors. More so, numerous authors have further captured the effectiveness of instruction. (6) argued that in order for lecturers to effectively educate, train, and convey knowledge to students, they must be able to apply both their subject-specific knowledge and a variety of other abilities. They continued by stating that good instructors must be able to adapt to changing circumstances and teach their pupils using a variety of teaching pedagogies, instructional tools, and communications and information technology. This is due to the pupils' unique variations in terms of their backgrounds, personalities, and learning styles.Teaching effectiveness as a variable in this study will be measured, using teaching methodologies, classroom management, content knowledge, and assessment procedure, as captured by (6); (7); and (8).

According to their research (9), the teaching methodology is the way a teacher chooses, conveys, or teaches knowledge content to students in order for the teaching to be effective in the classroom. (10), who emphasized that in order to achieve qualitative teaching, lecturers must offer content in a variety of ways and through a variety of methods. The technique by which a lecturer or instructor effectively managed a classroom while

William, Kayode; Isaruk, Ikpoko-ore-ebirien Dike; Ajagunna, Adedayo Emmanuel; Ada, Gaius Ph.D; and Wosa, Sylvanus A., "Information and Communication Technology (ICT) Competence and Teaching Effectiveness of Lecturers: A Case Study of Public Polytechnics in Ekiti and Ondo States, Nigeria," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 5, Issue 8, pp. 39-44, 2023.

teaching in public polytechnics is referred to as classroom management as a measure of instructional effectiveness. (11) confirmed that classroom management consists of the actions and procedures used by the lecturer to provide a comfortable environment for learning.

According to (12), subject matter expertise is defined as the teacher's in-depth knowledge or comprehension of the material to be taught. The process of evaluating a student's academic achievement by a lecturer using a variety of approaches is known as the evaluation procedure. It is nearly hard to teach pupils successfully without the use of technology in this information age (ICT). The usage of ICT by lecturers must therefore be proficient. ICT competence is conceptualized in accordance with (13). ICT competency is the ability to effectively use ICT for pedagogy, as well as to continuously evaluate pupils and get feedback on their performance. The three dimensions of basic, intermediate, and advanced ICT competency will be examined in this research.

According to (14)'s definition of basic competency, this is the capacity of elementary and primary school teachers to organize lesson plans, instruct and evaluate pupils using word processing, audiovisuals, and spreadsheets. According to (15), intermediate competence entails the skillful use of computers in teaching at a moderate level, the use of multimedia, and the use of the internet to look up educational resources for use in the classroom as well as to communicate. The ability to plan and manage networked learning, virtual communities, multimedia libraries, and employ advanced internet capabilities during the teaching-learning process is referred to as advanced competence, according to (16).

ICT skills and capacity building needs of teachers in technical and vocational education in Nigerian universities (17) research. The study's design was a descriptive one. The study's conclusions showed that lecturers' ICT proficiency is relevant to their efficacy. The survey also revealed that many lecturers' abilities to use ICT for instruction still need to be developed. Comparably, (18) found that ICT proficiency and use do contribute to high-quality instruction in their study named "Enhancing the Utilization of ICT among Home Economics Lecturers in South Eastern Nigeria." The study also revealed that many respondents were not receptive to the use of ICT in teaching, which may be because they lacked the necessary skills. The 19th study used a survey research approach and focused on "Developing an Educational Performance Indicator for New Millennium Learners" in South Korea. According to the study, teachers who have only mediocre information technology (IT) skills may do so for a variety of reasons and experience a range of repercussions.

(20) in their research on "Lecturers' ICT Competencies for Effective Implementation of ICT-Integrated Teaching and Learning in Textiles and Clothing Degree Programmes." The research was conducted in Malaysia using a descriptive survey research design. The study's findings showed that lecturers lacked the knowledge and abilities necessary to effectively employ ICT in their classroom settings. Additionally, it was shown that lecturers lacked the necessary technological pedagogical subject understanding for instruction in the ICT era. Additionally, (21) used a qualitative research design to conduct a study titled "Effect of ICT Skills on the Job Satisfaction of Teacher Educators: Evidence from the Universities in the Sindh Province of Pakistan." According to the research, 54% of teacher educators are familiar with ICTs and have high ICT abilities, but only 20% of them actually use them in their teaching and learning processes, and even then, the impact on student learning is only marginally significant. The study also demonstrated that the remaining group of teacher educators was unable to integrate ICTs into their instruction.

Similar to this, (22) used a qualitative research design to carry out their study in Malaysia, which was named "The Effectiveness of Training: Equipping and Enhancing ICT Knowledge and Skills among Polytechnic Lecturers in Producing Quality Highly Skilled Graduates." The study's findings showed that lecturers who participated as respondents thought that the purpose of edtech skills and tools was to improve student learning. A study on "Factors that Influence Teachers' Pedagogical Use of ICT in Secondary Schools: A Case of Ghana" in Ghana, using a survey research design, revealed that many felt unqualified to include ICT tools into their instruction. The study, Information and communication technology and lecturers' proficiency in Nigerian Universities, demonstrated that professors' usage of ICT was remained at the basic level of ICT use and on traditional activities such as information search, class presentation (24). According to the study, ICT has a significant multiplier effect on lecturers' work performance in higher education, which in turn aids in the achievement of institutions' vision and mission. In this context, the study suggested that an educational campaign be started to inform instructors and students about the need of becoming ICT compliant. In Morocco, a survey design was employed for a study titled "An Examination of the Impact of Computer Skills on the Effective Use of ICT in the Classroom." The study's findings demonstrated that instructors saw ICTs as being extremely important to their teaching and learning processes. Additionally, (26) looked at "Digital Competence and University Teachers' Conceptions about Teaching." The study was conducted in Spain utilizing a quantitative descriptive survey design and a structural causal model. The study demonstrated that the use of ICTs in the classroom and the lecturers' level of ICT proficiency have a substantial impact on their teaching style.

II. Statement of the Problem

Teaching efficacy is the ability of a teacher to impart knowledge to pupils through a variety of teaching techniques and to maintain a conducive learning environment in the classroom. Poor teaching has an impact on students' capacity for critical thought and problem-solving in relation to their fields of study, which limits their ability to make meaningful contributions to society. (27) concluded from their analysis that South West Nigeria's public polytechnic colleges' teaching effectiveness is subpar. Similar to this, (28) reported that the public polytechnic in Nigeria had poor teaching efficacy due to a weak curriculum, incompetent lecturers, among other problems. Public polytechnics in the Nigerian states of Ekiti and Ondo can also be shown to be in this predicament. This is

William, Kayode; Isaruk, Ikpoko-ore-ebirien Dike; Ajagunna, Adedayo Emmanuel; Ada, Gaius Ph.D; and Wosa, Sylvanus A., "Information and Communication Technology (ICT) Competence and Teaching Effectiveness of Lecturers: A Case Study of Public Polytechnics in Ekiti and Ondo States, Nigeria," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 5, Issue 8, pp. 39-44, 2023.

obvious since it can be seen that some students had poor critical thinking skills, poor idea articulation skills, and were unable to solve difficulties in their study areas.

III. Objective of the Study.

The main objective of this study is to investigate the influence of Information and Communication Technology Competence on lecturers teaching effectiveness in public polytechnics in Ekiti and Ondo states, Nigeria.
The specific objective is to:

1. Find out the influence of ICT Competence on Teaching Effectiveness of Lecturers in Pubic polytechnics in Ekiti and Ondo states.

III-1 Research Questions

1. What are the ICT competence level of lecturers in public polytechnics in Ekiti and Ondo states?

III-2 Research Hypothesis.

1. ICT competence will not significantly influence lecturers teaching effectiveness in public polytechnics in Ekiti and Ondo states.

IV. Research Methodology

Research Design

This study used a survey research design as its method of investigation. (1) defined research design as the plan, the framework of a study that specifies the type of study and the methods for assembling and analyzing data. The three public polytechnics in Nigeria's Ekiti and Ondo states each had 1,992 students, 116 lecturers, and 2,108 total participants in the study. Four hundred forty-nine respondents made up the study's sample, including three hundred and thirty-three (333) students and one hundred and sixteen (116) lecturers. This was obtained by applying the Taro Yamane formula. The researcher employed a combination of sampling strategies, including convenience sampling, proportional stratified random sampling, systematic random sampling, and purposive sampling, to select the faculties, departments, and levels where the self-structured questionnaire would be delivered.

V. Results

Data Presentation and Analysis of Research Question and Hypothesis

This section is focused on the analysis of the research question and hypothesis based on participants response rate.
Research Question one: What are the ICT competence level of lecturers in public polytechnics in Ekiti and Ondo states?

The table below shows the analysis of lecturers' ICT competence level in public polytechnics in Ekiti and Ondo states, Nigeria which are presented in frequency, percentage, mean and standard deviation formats, using very high level (5), high level 4, moderate level (3), low level (2) and not at all (1) rating scale.

Table 1 indicated a moderate level of ICT competence of lecturers in public polytechnics in Ekiti and Ondo states, Nigeria ($\bar{x}$=2.85). This implies that the lecturers on the overall, have an average skill level of ICT. Specifically, in terms of basic competence, the participants indicated a high level of ICT competence at ($\bar{x}$=3.92). Which suggests that participants are capable of performing many of the basic ICT tasks, such as connecting computer hardware and typing text into a word processor. With a mean score of ($\bar{x}$=2.82), the participants also indicated that lecturers in public polytechnics in the Nigerian states of Ekiti and Ondo had a moderate degree of intermediate ICT competence. Participants also reported that lecturers at public polytechnics in the Nigerian states of Ekiti and Ondo had low levels of ICT proficiency, with a mean score of ($\bar{x}$=1.80). The participants' inadequate skill with advanced ICT functions, such as employing visuals and animations while teaching and use of database management systems to access their students' data, is implied by this.

$H_0$1: ICT competence will not significantly influence lecturers teaching effectiveness in public polytechnics in Ekiti and Ondo states.

The table below presented the regression analysis of hypothesis one which says that ICT competence will not significantly influence lecturers teaching effectiveness in public polytechnics in Ekiti and Ondo states, Nigeria.

Table 2 shows the simple regression analysis result for the effect of ICT competence will not significantly influence lecturers teaching effectiveness in public polytechnics in Ekiti and Ondo states. The independent variable of ICT competence use was regressed against teaching effectiveness using simple linear regression analysis. The result revealed that ICT competence (β=0.133, t = 1.735, p>0.05) has positive but insignificant influence on the teaching effectiveness in public polytechnics in Ekiti and Ondo State. The F-test is 2.920. This demonstrates that there is enough data to support the model's ability to forecast teaching effectiveness. The coefficient of determination (R^2) is what explains how the dependent variable varies as a result of changes in the independent variable. The effect size is also indicated by the R^2 value. According to the regression model's R^2 (0.028), the public polytechnics in Ekiti and Ondo State's ICT competence accounts for 2.8% of the variation in teaching efficacy. The null hypothesis was approved as a result. Although the results imply that ICT competence contributes to the effectiveness of teaching at public polytechnics in Nigeria's Ekiti and Ondo States. This research makes it clear that opinions on the effectiveness of public polytechnics' teaching in Ekiti and Ondo State depend on ICT competence.

VI. Discussion of Findings

This study examined the impact of lecturers' ICT competence on their efficiency as lecturers in the public polytechnics of Nigeria's Ekiti and Ondo states. This section discusses the results of this study's findings and compares them to those of earlier research.

The first study question was to determine the ICT competency level of lecturers at public polytechnics in the states of Ekiti and Ondo. The study's findings demonstrated that lecturers at the chosen institution are familiar with using a basic ICT interface to support their teaching at diverse institutions. This is corroborated by a study (23) that found that teachers still primarily use the fundamental ICT skills in their instruction.

William, Kayode; Isaruk, Ikpoko-ore-ebirien Dike; Ajagunna, Adedayo Emmanuel; Ada, Gaius Ph.D; and Wosa, Sylvanus A., "Information and Communication Technology (ICT) Competence and Teaching Effectiveness of Lecturers: A Case Study of Public Polytechnics in Ekiti and Ondo States, Nigeria," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 5, Issue 8, pp. 39-44, 2023.

TABLE 1: Descriptive Analysis on the ICT competence level of lecturers

	Very High Level	High Level	Moderately Low	Low Level	Very low level	Mean	SD
Basic Competence (Mean = 3.92, SD = 0.84)							
I can connect computer main components and configure peripherals when needed in teaching	19	49	28	8	2	3.71	.92
	17.92%	46.23%	26.42%	7.55%	1.89%		
I can use ICT devices like cloud store as well as share course content in teaching	12	42	30	18	4	3.38	1.02
	11.32%	39.62%	28.30%	16.98%	3.77%		
I can use word processor to enter text and deliver course content in teaching	36	50	18	2	0	4.13	.76
	33.96%	47.17%	16.98%	1.89%	0.00%		
I can store lecture presentation slides as well as print presentation handouts from computer	38	52	14	2	0	4.19	.73
	35.85%	49.06%	13.21%	1.89%	0.00%		
I can manage educational files in the computer	38	50	16	2	0	4.17	.75
	35.85%	47.17%	15.09%	1.89%	0.00%		
Intermediate Competence (Mean = 2.82, SD = 1.06)							
I can install relevant educational applications on computer device, e.g installing Google clouds	6	14	39	38	9	2.72	.99
	5.66%	13.21%	36.79%	35.85%	8.49%		
I can use spreadsheet like Microsoft Excel to carry out calculations such as preparing students score sheet	8	18	31	44	5	2.81	1.02
	7.55%	16.98%	29.25%	41.51%	4.72%		
I can use internet resources to develop teaching or course materials	9	42	29	20	6	3.26	1.04
	8.49%	39.62%	27.36%	18.87%	5.66%		
I can access online database of my students' records	5	26	26	35	14	2.75	1.11
	4.72%	24.53%	24.53%	33.02%	13.21%		
I can insert customised image into power point presentation while preparing it	6	15	30	34	21	2.54	1.13
	5.66%	14.15%	28.30%	32.08%	19.81%		
Advance Competence (Mean = 1.80, SD = 1.07)							
I can protect computer network from virus, spyware and hackers	4	7	15	43	37	2.04	1.05
	3.77%	6.60%	14.15%	40.57%	34.91%		
I can configure as well as use web browser	6	5	7	18	70	1.67	1.15
	5.66%	4.72%	6.60%	16.98%	66.04%		
I can use database management system like Microsoft Access to create my students' records when necessary	6	4	4	31	61	1.71	1.10
	5.66%	3.77%	3.77%	29.25%	57.55%		
I can use computer graphics, animations while teaching	3	7	7	22	67	1.65	1.05
	2.83%	6.60%	6.60%	20.75%	63.21%		
I can use online educational software like Google Docs to assess or provide feedbacks to my students	4	5	12	42	43	1.92	1.02
	3.77%	4.72%	11.32%	39.62%	40.57%		
Overall Average Mean						**2.85**	**0.99**

Source: Field Survey 2021

KEY: ***Decision Rule if mean is less or equal to 1.49=Very Low; 1.5 to 2.49 = Low; 2.5 to 3.49 =Moderate; 3.5 to 4.49= High; 4.5 and above =Very High.

TABLE 2: Regression Analysis on the Influence of ICT Competence on lecturers teaching effectiveness

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	57.493	3.393		16.946	.000
	ICT COMPETENCE	.133	.077	.169	1.735	.086
a. Dependent Variable: TEACHING EFFECTIVENESS						
$R = .166$ $R^2 = .028$ Adjusted $R^2 = .018$ $F = 2.920$						

The study also showed that, in terms of the intermediate competency level, the professors from the chosen institutions have a reasonable level of ICT competency. This is reinforced by a study from (19), which shown that middle-level IT abilities in teaching could emerge from a variety of circumstances and have a variety of consequences on instruction. Similar to this, the results of the study (29) indicated that the professors possessed intermediate ICT abilities. This is in contrast to (17), who stressed in their study that while ICT competency is generally relevant to qualitative instruction, the teachers' ICT proficiency level was still below the moderate level and required improvement.

This study results also revealed that the lecturers of the selected institutions for the study have little or no knowledge of the advance ICT competence and this will have a diverse effect on their teaching abilities. This is also in line with (17) study that affirmed that lecturers used in their study lack advanced ICT skills, despite the fact that great ICT skills is crucial to qualitative teaching.

William, Kayode; Isaruk, Ikpoko-ore-ebirien Dike; Ajagunna, Adedayo Emmanuel; Ada, Gaius Ph.D; and Wosa, Sylvanus A., "Information and Communication Technology (ICT) Competence and Teaching Effectiveness of Lecturers: A Case Study of Public Polytechnics in Ekiti and Ondo States, Nigeria," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 5, Issue 8, pp. 39-44, 2023.

The result of the Research Hypothesis one revealed that ICT competence (β=0.133, t = 1.735, p>0.05) has positive but insignificant influence on the teaching effectiveness in public polytechnics in Ekiti and Ondo State. This is supported by (21) study whose results revealed that 20% of the respondents in their study ICT skills have low significance but positive influence on their teaching quality. However, the results is against the study of (26) who opined that that lecturers teaching method and quality is significantly influenced by their level of ICT skills.

The study's findings corroborate those of study (30), which revealed that teachers had a moderate level of ICT proficiency and mostly used ICT for social activities. They sporadically used it for teaching, and it had a negative impact on their instruction. Finally, the findings were consistent with the study by (31) which claimed that many of the lecturers who participated in the study as respondents were quite skilled in ICT and internet usage, and that this had a beneficial impact on the standard of their instruction.

VII. Conclusion

The study found that teaching effectiveness in public polytechnics in the states of Ekiti and Ondo is influenced by ICT competency. The study came to the conclusion that the level of ICT competency of lecturers at public polytechnics determines how successful their teaching is. According to statistics from the study, lecturers at public polytechnics in the Nigerian states of Ekiti and Ondo are more effective lecturers when they possess ICT skills..

VIII. Recommendations

Based on the findings of this study, the following recommendations were raised:

1. The Nigerian government, working with the ministry of education and the National Board for Technical Examinations (NBTE), should implement an education and awareness-raising program for lecturers at public polytechnics on the value of ICT competency, particularly advanced proficiency, in enhancing and maintaining teaching effectiveness in the twenty-first century.
2. The numerous directors of public polytechnics in the states of Ekiti and Ondo, as well as throughout Nigeria, should make sure that their schools have a variety of ICT resources available for their lecturers to use.
3. Public polytechnic lecturers in Ekiti, Ondo, and Nigeria should go above and beyond, perhaps by pursuing private training, to raise their level of ICT competency, particularly at the intermediate and advanced skill levels.

References

1. J. Babalola, “The university lecturer as a teacher”. 2018, Jun 5. Available from https://www.academia.edu/32603798/The_University_Lecturer_as_a_Teacher.
2. H. Wordu, and A. V. Ojorka, “Instructional delivery models and academic performance of agricultural science students in senior secondary schools in Rivers State, Nigeria”. Int. *Jor. Edu. Eva., vol.4, issues 9, 2018.* Retrieved from www.iiardpub.org
3. V. O. Uwaifo, “Technical education and its challenges in Nigeria in the 21st century”. Int. *NGOJ, vol. 5, issues 2, pp.* 40-44, 2009.
4. J. Y. Dung-Gwom, “Polytechnic Education and Nigeria Vision 20:2020**.** Conference: Convocation Lecture, Nasarawa State State Polytechnic, Lafia, Nigeria”. 2014, September, 25. Retrieved from, DOI:10.13140/RG.2.1.2996.6320
5. P. Sehgal, R. Nambudiri, and S. K. Mishra, “Teacher effectiveness through self-efficacy, collaboration, and principal leadership”. *Int. J. Educ. Manag., vol. 31, issues 4, pp.* 505-517, 2017.
6. D. Osakpa, D. Okonkwo, and S. Ejiogu, “Teaching effectiveness of lecturers with polytechnic or university basic business education in Nigeria”. Afri. Res. Res., vol. 12, issues 102, pp. 102-110, 2018.
7. L. W. Anderson, “Increasing teacher effectiveness. Paris: UNESCO/international Institute for Planning”. 2004, May 10. Available from Google Scholar.
8. B. U. Onyekuru, and J. O. Ibegbunam, “Teaching effectiveness of secondary school teachers in Emohua Local government area of Rivers state, Nigeria”. Eur. Sci. J., vol.9, issues 28, pp. 222-226, 2013.
9. A. Gill, and Kusum, “Teaching approaches, methods and strategy”. *Sch. Res. J. Interdiscip. Stud*., vol. 4, issues 36, pp. 6692-6697, 2017.
10. S. W. Amedioha, “Research trends in curriculum (EDC 942). The History of Curriculum Development in Nigeria”. Lecture note, 2018. Unpublished.
11. I. N. George, A. O. Sakirudeen, and A. H. Sunday, “Effective classroom management and students’ academic performance in secondary schools in Uyo local government area of Akwa Ibom State”. *Res.* Pedagog, vol.7, issues 1, pp. 43-56, 2017.
12. M. O. Odumosu, O. Olisama, and V. Areelu, “Teachers’ content and pedagogical knowledge on students’ achievement in algebra”. Int. J. Educ. Res, vol. 6, issues 3, pp. 83-94, 2018.
13. M. A. Cruz-Cobenas, and W. Carcausto-Calla, “Digital competence, new perspectives for teaching in context of social isolation”. *EDUSER, vol. 7, issues 2, pp.* 119-126, 2020.
14. A. Syahid, I. Isrokatun, and D. Nugraha, Development of a training curriculum structure to improve ICT competencies of teachers in primary schools”. *MSD, vol. 6, issues 1, pp.* 21-31, 2019.
15. G. Almerich, N. Orellana, J. Suárez-Rodríguez, I. Díaz-García, “Teachers’ information and communication technology competences: A structural approach”. *Comput. Educ., vol. 100*, 110–125, 2016.
16. B. Janiunaite, V. Jakstiene, and G. Cibulskas, Preconditions of the manifestation of Teacher’s ICT Competence in the Study. International Conference on Advanced Information and Communication Technology for Education. 2013, November,30, 390-394.
17. S. O. Chukwuedo, and V. I. Igbinedion, “ICT competence and capacity building of technical and vocational education lecturers in Nigerian universities”. *AJIS*, vol. 13, isssues 7, pp. 45-53, 2014.
18. U. B. Ejinkeonye, and C. I. Usoroh, “Enhancing the utilization of information communication technology (ICT) among home economics lecturers in South Eastern Nigeria”. *J. educ. Prac.*, vol. 7, issues 9, pp. 34-39, 2016.
19. M. Kang, H. Heo, LL-H. Jo, J. Shin, and J. Seo, “Developing an educational performance indicator for new millennium learners”. *J. Res. Technol. Educ*, vol. 43, issues 2, pp. 157-170, 2010.
20. C. Dzikite, Y. Nsubuga, and V. Nkonki, “Lecturers competencies in Information and Communication Technolgy (ICT) for effective implementation of ICT integrated teacher and learning in textiles and clothing degree programmes, *Int. J. Educ. Sci. 2017, November,10, 17*((1-3). 61-68.
21. Z. Sahito, and P. Vaisanen, “Effect of ICT skills on the job satisfaction of teacher educators: evidence from the universities of the Sindh province of Pakistan”. *Int. J. High. Educ*, vol. 6, issue 4, pp. 122-136, 2017.
22. A. Ahmad, and A. H. Mohamed, “The effectiveness of training: equipping and enhancing ICT knowledge and skills among polytechnic lecturers in producing quality highly skilled graduates”. *AJTVE*, vol. 1, issues 3, pp. 01-05, 2017.
23. C. Buabeng-Andoh, “Factors that Influence Teachers’ Pedagogical Use of ICT in Secondary Schools: A Case of Ghana”. *Contemp. Educ. Technol*. Vol. 10, issues 3, 272-288, 2019.
24. A. O. Sofoluwe, “Information and communication technology and lecturers’ proficiency in Nigerian Universities”. *Malaysian Online J. Educ. Manag., vol. 3, issues 3, pp.* 45-60, 2015.
25. A. Khaloufi and H. Laabidi, “An Examination of the Impact of Computer Skills on the Effective Use of ICT in the Classroom”. *Indones. J. EFL Linguist, vol. 2, issues* 1, pp. 53-69, 2017.

William, Kayode; Isaruk, Ikpoko-ore-ebirien Dike; Ajagunna, Adedayo Emmanuel; Ada, Gaius Ph.D; and Wosa, Sylvanus A., “Information and Communication Technology (ICT) Competence and Teaching Effectiveness of Lecturers: A Case Study of Public Polytechnics in Ekiti and Ondo States, Nigeria,” *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 5, Issue 8, pp. 39-44, 2023.

26. A. B. Mirete, J. J. Maquilón, L. Mirete, And R. A. Rodríguez, "Digital Competence and University Teachers' Conceptions About Teaching. A Structural Causal Model". Sustainability, Vol. 12, Issues 12, P. 4842, 2020.
27. J. Bakare, B. I. Onah, and G. K. O. Okereke, "Capacity building needs of lecturers in e-teaching for effective delivery of computer and electrical/electronic technology courses in tertiary institutions in southwestern, Nigeria." Int. J. Appl. Eng. Res, vol. 13, issues 11, pp. 8736-8750, 2018.
28. O. T. Owo, and P. M. Ajie, "Impediments to effective utilization of e-learning platforms for quality teaching and learning in universities in Niger-Delta, Nigeria." Int. J. Innov Res, vol. 9, issues 7, pp. 128-133, 2020.
29. F. T. Shiekuma, L. Apagu, and J. O. Segun, "ICT Skills Application in Teaching and Research by Lecturers in some Selected Universities in Nigeria". *CJLIS, vol.3, issues 1, pp.* 50-63, 2020.
30. J. Enu, D. Nkum, E. Ninsin, C. A. Diabor, and D. P. Korsah, "Teachers' ICT Skills and ICT Usage in the Classroom: The Case of Basic School Teachers in Ghana". *J. educ. Prac., vol. 9, issues* 20, pp. 35-38, 2018.
31. M. Tsvere, S. Swamy, and T. L. Nyaruwalia, T. L. "Perceived competence of Zimbabwean academics in the use of information technology in university academic business". *Int. J. Sci. Res, vol. 2, issues 8, pp.* 284-289, 2013.

William, Kayode; Isaruk, Ikpoko-ore-ebirien Dike; Ajagunna, Adedayo Emmanuel; Ada, Gaius Ph.D; and Wosa, Sylvanus A., "Information and Communication Technology (ICT) Competence and Teaching Effectiveness of Lecturers: A Case Study of Public Polytechnics in Ekiti and Ondo States, Nigeria," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 5, Issue 8, pp. 39-44, 2023.