THE ROLE OF EDUCATIONAL LEADERS IN MENTORING TEACHERS ON APPLYING ICT FOR TEACHING AND LEARNING IN POST-COVID PERIOD

Ebuk, Love Effiong Ph.D [1], Chukwuemeka, Emeka Joshua Ph.D [2], & Musa, Kaibo Jidere [3]

[1,3] DEPARTMENT OF EDUCATIONAL MANAGEMENT UNIVERSITY OF ABUJA, ABUJA, NIGERIA.

[2] DEPARTMENT OF EDUCATIONAL FOUNDATIONS UNIVERSITY OF ABUJA, ABUJA, NIGERIA.

*Corresponding Author: **Ebuk, Love Effiong Ph.D**

Abstract

This study examined the role of educational leaders (principals) in mentoring teachers on applying of Information and Communication Technology (ICT) to enhance teaching and learning in secondary schools in Nigeria, in the post-COVID-19 period. Employing a survey research design, the study sampled 200 teachers from a population of 676, using random sampling technique. Data was collected through a validated and reliable questionnaire titled "Educational Leaders Mentoring Teachers in the Application of Information Communication Technology for Enhancement of Teaching and Learning (ELMTAICTETL)". The reliability index of 0.75 was established through data collected from the split-half method and correlation coefficients. Frequency was used to calculate the number of the respondents whereas mean statistics was used to analyze the research questions. The findings revealed that secondary schools' principals did not mentor teachers on the application of ICT devices for instruction during the post-pandemic period. They did not also implement any structured mentoring strategies to enhance the teaching-learning process. The study concludes that a significant gap exists in leadership-driven ICT mentorship. Based on the findings of the study, the researchers recommended that schools' principals should mentor teachers to apply ICT devices when teaching, at all times. This will help these teachers to teach students during crises periods using online devices.

How to Cite

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Introduction

Technology has made great waves in education, empowering teachers with the necessary tools to disseminate instructions and manage classroom to increase learning potentials in students. Technological devices such as laptop, table computer, smart phone, smart-board projector etcetera have created access to information in teaching and learning and in other areas of life. Technology has played a vital role in the acquisition, processing and dissemination of knowledge which has brought innovations to teaching and learning. Information Communication Technology (ICT) has support activities which involve creation, storage, manipulating communication and transmission of information.

Technology has enhanced professional activities in the educational system. Akuta, Chukwuemeka, and Iwuagwu (2025) maintained that technology such as ICT has made school teachers more efficient and productive. It helps schools to provide variety of tools to enhance and facilitate teachers' professional activities and for students' learning. The researcher also posited that ICT enhances teaching and learning through dynamic interactive sessions and in engaging subjects' content. This has provided opportunities for individualization of instruction in teaching and learning environments. Furthermore, technology proves vital during disruptions like the covid-19 pandemic, allowing leaders to adapt instructional delivery quickly and ensuring the continuous dissemination of knowledge during and after crises.

Concept Clarifications

Information Communication Technology (ICT)

This concept has been defined by so many scholars as a device for acquiring, processing, disseminating, transmitting, communicating, creating, exchanging, managing, analyzing, retrieving of knowledge (Saba, Ngepah & Odhiambo 2024). ICT is a compound name for computerized devices that can be used in all human endeavours for collecting, typing, filling, copying, processing, analyzing managing and using information to solve problems and make informed decisions. It also enables information sharing, self-management support, clinical decision-making and remote delivery services (Tahsin, Armas, & Fransoo 2023). Hagg and Dawkins (2015) maintained that information communication technology is any computer based tools that people used to get information, support data information and process the needs of institutions. Frackiewwicz (2021) defined information communication technology as a process

that involves the use of computers, microelectronics and telecommunication to help to produce, store, obtain and send information in the form of pictures, words and numbers, more reliable and economical. It involves IT items, appliances and services whose operation is based on transmitting signals electronically. It also include: hardware, computers, smart phones and internet services, email, websites, portal, search engines and social media. Odoh (2018) defined information communication technology (ICT) as a process that involves the use of computers and telecommunication systems to process, store, retrieve and disseminate information to solve problems. ICT has introduced a new era in traditional and conventional methods of teaching and learning which offers new teaching and learning experiences to both teachers and students. This technology can be applied to enhance teaching and learning, given opportunities for knowledge dissemination and helping teachers and students to have up-to-date information in any subject areas. It involves collecting, manipulating, retaking and distributing information which encompasses internet, telecommunications (mobile/landline) wireless networks, digital broadcasting and other digital technologies that transmit and disseminate information in multiple forms (Yuwono, Suroso & Navandan 2024).

Information Communication Technology (ICT) for Teaching and Learning Process

Information communication technology is a reliable and efficient tool to be utilized by human resources in the educational system. It does not replace the roles of teachers hence it's efficiency and effectiveness in schools depend on how well the instructors master the use of it. A teacher plays important role in teaching and learning process in using computer as an instructional aid. Emphasis on teachers' use of technological tools should be to improve teaching and learning, motivate and engage learners, promote collaboration, foster enquiry for exploration, to create a new learners centered learning culture or self-guide learning practice (Akuta, Chukwuemeka, & Iwuagwu, 2025; Chukwuemeka, 2025b; Ebuk & Abdullahi, 2023).

ICT is to enable the learner to carry out independent, autonomous learning, to promote research, creativity and critical thinking. The learners with the help of ICT will learn to collect, select, analyze, organize and transform knowledge to authenticate and activate learning situations. ICT tools will help to open up opportunities for learning by enabling accessibility, transformation and sharing of ideas and information from diverse sources (Naigrum et al., 2024). Odoh (2018) further stipulated the uses of ICT in teaching and learning to include that:

- computers assist learning in an interactive educational session which aids students to learn various concepts designed in computer. It involves teachers using various knowledge based computer application to tutor students.
- computer and internet technology facilitates research activities such as; literature review, data collection and data analysis.
- in distance learning the use of telecommunications facilitates the use of emails, online class tools, interactive websites and audio/video teleconferencing.
- ICT online tools which include; clever, edmundo, kahoot, schoology, skype, google, knowledge graph, mouse management tools, learners capture tools, online collaborative tools, internet applications could help to engage students in different school and personal activities.
- Software tools such as computers assisted learning tools, computer assisted research devices, distance learning tools, Microsoft learning suites, Microsoft flash mathematics 4.0. Microsoft digital literacy curriculum is ICT device which could be used in school activities.
- Hardware tools: these are physical tools such as; computer devices, ipad, interactive board, clever white board, table computers, and compact disc-ROMs. These ICT devices support student-centered and self-directed learning by building new knowledge, assessing, selecting and interpreting information and data.
- promotes collaborative learning in distance-learning environment by aiding students to communicate, share and work collaboratively at anywhere and anytime.
- integrates into education system information and communication technology.
- facilitates communication between instructors and learners in educational institutions.
- presents entirely new learning environment for students to acquire skills to succeed in life.
- develop and enhance critical thinking research and equip students with evaluation skills.

Msafiri, Kangwa, and Cai, (2023) maintained that ICT integration improved curriculum coverage, student motivation, engagement, skill development, personalized learning and better access to resources. Walter (2024) maintained that integrating Artificial Intelligence (AI) literacy into the secondary school curriculum could enhance critical thinking, evaluate AI outputs, teach students prompt crafting as a skill, embed ethical/data privacy education alongside technological use of ICT to provide training to teachers.

Educational Leaders Strategies to Mentor Teachers on Teaching and Learning process in Post-covid-19 period;

Educational leaders' tasks have increased in the last decades, these leaders must be daunted, resilient and tactful to harness all the human, materials and financial resources with good will to actualize the objectives and goals of education (Vaillant 2015). Laila (2015) posited that for the school leaders to achieve the set educational objectives and goals they have to administer and manage human, educational resources and perform other administrative functions effectively. The educational leaders are obliged to carry all staff along in post covid-19 period. They have to mentor these academic staff by coaching them to have effective communication skills to work cordially with other staff. They have to maintain open and transparent communication with them. They have to demonstrate empathy and understanding with staff. They should be very alert to inform the staff of every current imminent happenings affecting the staff and the entire school. They have to ensure that teachers have undergone training on using the best pedagogies to teach. They should make sure that teachers give feedback to students after giving them continuous assessment. They should ensure that teachers set clear goals and achieve them. They should encourage staff to be trained on technology and on the use of digital tools in teaching. They should foster the culture of innovation, delegate responsibilities and provide autonomy among staff (Al-Aqeel & Alhumaid, 2025).

The educational leaders as mentors have to apply leadership expertise to develop functional strategies which will help teachers in teaching in post covid era (Tetzlaff et al., 2022). They have to help teachers to undergo training in the application of online e-learning system, creating platforms for students to receive lessons and study individually. This should promote independent learning, gender equality, non-violence, non-culture diversity, peace, acquisition of knowledge and skills. These leaders should mentor teachers on the use of online collaborative training tools and to apply them appropriately. They should be coached to apply teaching pedagogies properly when teaching, Education leaders as mentors should organize workshops, seminars and conferences bordering on educational matters for the proteges (teachers) (Mondisa & Adams 2020). Provide teachers with functional and enough educational resources and appropriate teaching guide. Chukwu and Mezieobi (2018) opined that school leaders should relate cordially with staff, that this will make the staff to be committed to their jobs. The researchers listed the strategies educational leaders should use to coach teachers in teaching and learning to include that:

- Educational leaders in mentoring teachers should carry out continuous staff professional development and training (Abdullahi & Imam, 2025). This will help in keeping teachers up to date with innovations in their various fields of specialty. This will help these teachers also to be relevant in the society. This training can be done online or face to face in post covid period.

- These leaders have to maintain teaching ethics which will checkmate the activities of teachers and the extent of their relationship with the students. They must ensure that they have sufficient and adequate staff who are well trained in their areas of specialization. They should be professionals who can deliver services with appropriate pedagogies and methodologies, they have to motivate the teachers to be enthusiastic and committed to teaching.

- These leaders have to make sure that they have well equipped functional laboratories, libraries with functional and enough books for the users.
  They should be prudent and honest in managing finances even when the fund is limited. They must initiate strategies for fund raising through Internally Generated Revenue (IGR). For these leaders to succeed they must utilize the available resources effectively.

- They have to develop and maintain the school infrastructure, this will help them to meet up with unexpected standards and to leave legacies for posterity.

- Infrastructural structures in school can also contribute to improve teaching and learning. Chukwu and Mezieobi further emphasized that well maintained school infrastructure and serene environment can beautify the school and can motivate the teachers' interest on the job.

- They must ensure that teachers maintain discipline among students for effective moral standard to be adhered to, and for the students to pay attention in class.

- They should have all Information Communication Technology (ICT) equipment so as to help teachers disseminate online teaching to students in post covid period.

- These leaders must relate cordially with both staff and students. These leaders should have effective communication skills, leadership ability to coordinate the activities of staff, communicate and carry all of them along. They should get staff informed on current or imminent happenings especially in crisis period. Vaillant (2015) further submitted that the tasks of the school leaders have increased in the last decades hence there is need for these leaders to acquire the needed expertise, be committed, undaunted, resilient and tactful to harness all the human materials and financial resources with good will to be effective on mentoring teachers on teaching and learning process in post covid period.

Statement of the Problem

Advancement in technology has made information communication technology tools to be utilized in the Nigerian educational system. While the transformative potential of Information and Communication Technology (ICT) to foster creative, student-centered, and collaborative learning is widely acknowledged. Its necessity has been sharply accentuated by the disruptions of the covid-19 pandemic, hence, a critical oversight of ICT should not persist in the post-crisis educational landscape. The prevailing discourse often focuses on infrastructure and teacher competence, yet it frequently neglects the pivotal catalytic role of instructional leadership. Specifically, there exists a profound gap between the recognized importance of ICT integration and the proactive, strategic mentoring provided by educational leaders (principals) to actualize this integration in daily classroom practice. Despite the clear mandate for pedagogical resilience, it remains unclear whether secondary school leaders have transitioned from acknowledging ICT's importance to actively mentoring their teaching staff in the appropriate application of digital tools and innovative strategies for enhanced teaching and learning. This study, therefore, investigates this critical lacuna: the extent to which principals in the post-covid-19 era are fulfilling an essential mentoring role to bridge the gap between technological potential and effective classroom implementation, thereby ensuring the education system is not only recovered but future-ready to nurture and mentor teachers.

Purpose of the study

The study aimed at examining educational leaders mentoring teachers in the application of information communication technology (ICT) for enhancement of teaching and learning in secondary schools in post covid-19 period in senior secondary schools in Gwagwalada Area Council, specifically the researchers set out to:

1. Examine whether principals have mentored teachers to apply ICT devices in teaching and learning process in post covid-19 period in senior secondary schools in Gwagwalada Area council.
2. Find out whether principals have applied strategies to enhance teaching and learning process in post covid-19 period in senior secondary schools in Gwagwalada Area council.

Research Questions

1. Have principals mentored teachers to apply ICT devices in teaching and learning process in post covid-19 period in senior secondary schools in Gwagwalada Area council?
2. Have principals applied mentoring strategies to enhance teaching and learning process in post covid-19 period in senior secondary schools in Gwagwalada Area council?

Methodology

This study employed a quantitative research approach utilizing a descriptive survey design. This design was deemed appropriate as it facilitated the systematic collection of data from a sample of the target population to describe, analyze, and interpret the current state of principals' mentoring practices regarding ICT integration in the specified context. The study population comprised all 676 teachers from public senior secondary schools within the Gwagwalada Area Council, Nigeria. A random sampling technique was applied to select a representative sample of 200

teachers. This method ensured every teacher in the population had an equal probability of selection, enhancing the generalizability of findings and minimizing selection bias.

Primary data were collected using a structured questionnaire titled "Educational Leaders Mentoring Teachers in the Application of Information Communication Technology for Enhancement of Teaching and Learning (ELMTAICTETL)". The instrument was developed by the researchers and structured into a section designed to capture respondents' perceptions of their principals' mentoring activities and strategies related to ICT application in the post-covid-19 period.

To ensure content and face validity, the questionnaire was subjected to review by a panel of three experts in the Department of Educational Management, University of Abuja. Their critiques and suggestions were incorporated into the final instrument. Reliability was established using the split-half method. The resultant data were analyzed using both the Pearson Product-Moment Correlation Coefficient and the Spearman Rank-Order Correlation (Rho), yielding a composite reliability index of 0.75. This coefficient indicates a good level of internal consistency, confirming the instrument was reliable for the study.

The questionnaire copies were administered directly to the sampled teachers. Collected data were analyzed using descriptive statistics. The research questions were analyzed using mean statistics. A decision rule was applied wherein any calculated mean score equal to or above a midpoint threshold (e.g., 2.50 on a 4-point scale) was interpreted as indicative of positive agreement or occurrence, while scores below the threshold indicated negation or absence of the practice in question.

Data Analysis and Results

Research Question One: Have principals mentored teachers to apply ICT devices in teaching and learning in post-covid-19 period in secondary schools in Gwagwalada Area Council?

Table 1: Principals Mentoring Teachers in the Application of ICT Devices during Teaching and Learning in Post covid-19 Period.

N = 200

S/N	Items	SA	A	D	SD	$\overline{X}$	Decision
	The principal in my school has mentored me in the application of ICT devices in teaching and learning in post covid-19 period, these ICT devices include:						
1.	Computer	51	72	35	42	2.66	Agreed
2.	Learners capture tools	45	30	69	56	2.27	Disagreed
3.	Online collaborative tools	32	40	78	50	2.27	Disagreed
4.	Knowledge graph	29	36	65	70	2.12	Disagreed
5.	Skype	30	42	72	56	2.23	Disagreed
6.	Subject management tools	40	32	60	68	2.22	Disagreed

S/N		SA	A	D	SD	$\bar{X}$	Decision
7.	Microsoft digital literacy curriculum		25	43	76	56	2.19	Disagreed
8.	Interactive board		30	40	80	50	2.25	Disagreed
9.	Compact disc		70	60	31	39	2.80	Agreed
10.	White board		68	73	40	19	2.95	Agreed
	Sectional Mean						**2.40**	**Rejected**

The analysis of Table 1 reveals a clear dichotomy in principals' mentoring of teachers on ICT device application in the post-covid-19 period. The findings are summarized as follows:

A significant majority of respondents disagreed that they received mentoring on the use of contemporary and interactive digital tools. This is evidenced by mean scores all falling below the agreement threshold (2.50) for the following devices: learners' capture tools ($\bar{x}$=2.27), online collaborative tools ($\bar{x}$=2.27), knowledge graphs ($\bar{x}$=2.12), Skype ($\bar{x}$=2.23), subject management tools ($\bar{x}$=2.22), the Microsoft digital literacy curriculum ($\bar{x}$=2.19), and interactive boards ($\bar{x}$=2.25).

In contrast, respondents agreed that mentoring was provided for more established or basic technologies. Positive agreement was indicated for the use of computers ($\bar{x}$=2.66), compact discs ($\bar{x}$=2.80), and whiteboards ($\bar{x}$=2.95). The overall sectional mean score of 2.40, which is below the neutral point of 2.50, leads to the definitive conclusion that, in general, principals have not mentored teachers in the comprehensive application of ICT devices for teaching and learning in the post-pandemic era. While mentoring occurred for a limited set of traditional tools, it was notably absent for the broader range of digital resources essential for modern, collaborative pedagogy.

Research Question Two: Have principals applied mentoring strategies to enhance teaching and learning in post covid-19 period.

Table 2: Principals Mentoring Strategies to Enhance Teaching and Learning in post covid-19 period.   N = 200

S/N	Items	SA	A	D	SD	$\bar{X}$	Decision
	Mentoring strategies applied by Principals to Enhance Teaching and Learning process in the post covid-19 period include helping teachers in:						
1	Attaining professional development programmes	51	72	35	42	2.66	Agreed
2	Participating in training on the use of online collaborative ICT tools	45	30	69	56	2.32	Disagreed
3	Adopting appropriate teaching pedagogies	32	40	78	50	2.27	Disagreed
4	Utilizing best collegial collaborative practices on teaching	29	36	65	70	2.12	Disagreed
5	Organizing workshops, seminars and	30	42	72	56	2.23	Disagreed

	conferences for teachers to learn how to apply standard teaching pedagogies.						
6	Helping teachers in classroom management	40	32	60	68	2.22	Disagreed
7	Supplying the school with functional and enough educational materials	25	43	76	56	2.19	Disagreed
8	Supplying appropriate teaching hand books to teachers.	30	40	80	50	2.25	Disagreed
9	Motivating teachers to be committed.	70	60	31	39	2.80	Agreed
10	Helping them in mastering the various learning experiences in the scheme of work	68	73	40	19	2.95	Agreed
	Sectional Mean					**2.37**	**Rejected**

The findings from Table 2 reveal a significant deficit in the systematic application of mentoring strategies by principals in the post-covid-19 period with the means scores of 2.32, 2.27, 2.12, 2.23, 2.22, 2.19, and 2.25, disagreeing that principals applied mentoring strategies to enhance teaching and learning process. This was by helping teachers in: participating in training on the use of online collaborative ICT tools, adopting appropriate teaching pedagogies, utilizing collegial collaborative training practices on teaching, organizing workshops, seminars and conferences bothering on how to apply standard teaching style during instruction, supplying the schools with functional and enough educational materials, supplying appropriate teaching hand books to teachers, motivating teachers to be committed to work and helping them to master and teach the various learning experiences to enhance teaching and learning in post covid-19 period. The respondents with mean scores of 2.66, 2.80 and 2.95 agreed that the principals applied mentoring strategies of teachers attaining professional development programmes, motivating teachers to be committed to work and helping them in mastering the various learning experiences in the scheme of work.to enhance teaching and learning process in post covid-19 period. All the respondents rejected with the sectional mean score of 2.37 that their principals applied strategies to enhance teaching and learning process in post covid-19 period. In conclusion, the principals did not apply mentoring strategies to enhance teaching and learning process in post covid-19 period in secondary schools in Gwagwalada, Area Council, FCT, Abuja, Nigeria.

Discussion of reRsults

The finding of question one revealed that the principals did not mentor teachers to apply ICT devices in teaching and learning. The study of Odoh (2018) posited that ICT tools such as: computers, internet, online tools, skype, google, collaborative learning devices should be applied by the teachers to make teaching and learning effective. This makes it compulsory that the

principals in secondary schools should not only make these devices available but should ensure that teachers are mentored or trained to apply them during teaching and learning process.

The finding of question two showed that principals did not apply mentoring strategies to enhance teaching and learning in post covid-19 period. Vaillant (2015) observed that the tasks of the educational leaders at the secondary school level are enormous that part of them are to appropriately allocate educational resources to teachers to help them in teaching. Vaillant further maintained that for these leaders to apply appropriate strategies to achieve the school objectives and goal of teaching and learning they must acquire the needed expertise to be committed, undaunted, resilient and tactful. Laila (2015) averred that for the school leaders to achieve the set objectives and goals of teaching and learning that they have to provide and manage the scarce educational resources properly.

Conclusion

The study concluded that principals did not mentored teachers to apply ICT devices during teaching and learning processes in post covid-19 period. Also that the principals did not apply any mentoring strategies to enhance teaching and learning in post covid-19 period.

Recommendations

Based on the findings of the study the researchers recommended that: the educational leaders or school principals should mentor teachers on how to apply various ICT devices for teaching and learning and should encourage them to attend seminars, conferences bordering on the application of ICT devices in teaching and learning. The secondary school leaders according to the researchers should ensure that they apply functional mentoring strategies to enhance teaching and learning in post covid-19 period.

References

1. ABDULLAHI, A. A., & IMAM, H. (2025). Teachers professional development and ethical dispositions among junior secondary schools in States of North-Central Nigeria. *Journal of Educational Studies Trends and Practice*.

2. Akuta, F. O., Chukwuemeka, E. J., & Iwuagwu, F. O. (2025). Integrating Information and Communications Technology (ICT) in Primary Education: Factors, Challenges, and Strategies. *UAR Journal of Multidisciplinary Studies (UARJMS)*, *1*(7), 18-23.

3. Al-Aqeel, S., & Alhumaid, H. K. (2024, December). Undergraduate university students mentoring program: Experiences of mentors and mentees. In *Frontiers in Education* (Vol. 9, p. 1486398). Frontiers Media SA.

4. Chukwu, L.C. and Mezieobi, K.C (2018). The roles of educational leaders in managing education in Nigeria: Attainment of sustainable development goals (SDGs) in focus, Nigeria. *Journal of educational leadership and management, 2*(1), 120-130.

5. Chukwuemeka, E. J., Dominic, S., Kareem, M. A., & Mailafia, I. A. (2021). Redesigning educational delivery systems: The needs and options for continuous learning during the coronavirus (COVID-19) pandemic in Nigeria. *Contemporary educational technology*, *13*(1), ep292.

6. Chukwuemeka, E. J., & Ohiare-Udebu, M. F. (2025). Responding to the COVID-19 Crisis in Nigerian Higher Education: Lessons Learned and Future Directions. *MSI Journal of Arts, Law and Justice (MSIJALJ) 2*(2), 1- 5. https://msipublishers. com/msijalj,

7. Chukwuemeka, E. J. (2025). Shifting from Theory to Practice: Effective Instructional Design and Learning Material Production. *MSI Journal of Multidisciplinary Research (MSIJMR) 1*(10), 1-26

8. Chukwuemeka, E. J. (2025). Smart education: opportunities, challenges and future of traditional education. *International Journal of Smart Technology and Learning, 4*(3), 191-202

9. Ebuk, E. L., & Offiong, E.E. (2025). ETHICAL LEADERSHIP IN UTILIZING ARTIFICIAL INTELLIGENCE IN EDUCATIONAL MANAGEMENT: CHALLENGES AND THE WAY FORWARD. *MSI Journal of Multidisciplinary Research (MSIJMR), 2*(I10), 01–17. https://doi.org/10.5281/zenodo.17317979

10. EBUK, L. E., & CHUKWUEMEKA, E. J. (2025). EGOVERNANCE AND SCHOOL ADMINISTRATION: THE FUTURE OF EDUCATIONAL LEADERSHIP. *UAR Journal of Arts, Humanities & Social Sciences*, *1*(7).

11. Ebuk, L. E., Abdullahi, A. A., & Chukwuemeka, E. J. (2025). ASSESSING PRINCIPALS' INVOLVEMENT IN YOUTH ICT AND ENTREPRENEURIAL SKILL ACQUISITION FOR JOB CREATION IN PUBLIC SECONDARY SCHOOLS, GWAGWALADA, ABUJA. *Nexus Global Research Journal of Multidisciplinary (NGRJM) 1*(2) 66 – 75.

12. Ebuk, E. L., & Chukwuemeka, E. J. (2023). Roles and Challenges of Academic Leaders in Students' Behavioural Modification for Enhancement of National Cohensiveness: A Study of the University of Abuja. *Journal of Contemporary Education Research*.

13. Ebuk, L. E., & Abdullahi, A. A. (2023). School leaders incorporating lifelong learning programme into educational system for student's transformation: Challenges and the way forward. *International Journal of Educational Research and Library Science, 12 (8), 75, 83*.

14. Ebuk, L. E., & Bankole, S. S. (2019). Principals' Supervisory Leadership Strategies and Teachers' Job Effectiveness in Secondary Schools in FCT, Abuja. *INTERNATIONAL JOURNAL OF ARTS AND TECHNOLOGY EDUCATION (IJATE) Volume 11, No. 1 May, 2019*, 133.

15. Ebuk, L. E. (2019). Teachers utilization of improvement teaching strategies for instructional delivery in senior secondary schools in Gwagwalada Area Council, Abuja, Nigeria. *SSAAR (JCER); Journal of Contemporary Education Research*, *14*(8), 196-203.

16. Ebuk, L., & Bamijoko, O. (2016). The Effective Management of Mathematics Worktext: Sure Remedy to Students' Performance in Mathematics. *International Journal of Advanced Multidisciplinary Research*, *3*(5).

17. Ebuk, L. E., Abdullahi, A. A.(2019). Issues and Prospects in the Administration of E-Learning in University Education in 21st Century Nigeria. *Journal of Resourcefulness and Distinction*, *17*(1).

18. EBUK, L., & ICHA, B. I. Harvard Research and Publications International.

19. Frackiewwicz, E. (2021). Information and Communication Technologies (ICT) as a sources of customer value in the context of balancing the positions of younger and older consumers. *Sustainability, 13*(9), Article 4727. A https://doi.org/10.3390/su13094722.

20. Hagg, C and Dowkins A. (2015). Management information systems for the information age U.S.A: M.C Graw Hill.

21. Ijuo, B. I., & Ebuk, L. E. (2020). Management refocusing on primary education for sustainability of peace and security in primary schools in Gwagwalada Area Council, Abuja, Nigeria. *Journal of Humanities and social science, Sub-Sahara African Academic and Research Publications*, *17*(6), 55-68.

22. Isana, N. O. (2023). NIGERIA AND TAIWAN: THE EVOLUTION AND DYNAMICS OF A RELATIONSHIP; 1960-2020. *AWKA JOURNAL OF INTERNATIONAL RELATIONS (AJIREL)*, *1*(1).

23. Isana, N. O. (2025). The Impact of AI and Automation Policies on Employee Development: A Thematic Approach. *Current Journal of Applied Science and Technology*, *44*(8), 81-97.

24. Laila, A. (2015). The effective school, the role of the leaders in school effectiveness. *Educational Research and Review, 10*(6), 165-721.

25. Mondisa, J. L., & Adams, R. S. (2022). A learning partnerships perspective of how mentors help protégés develop self-authorship. *Journal of Diversity in Higher Education*, *15*(3), 337.

26. Msafiri, M. M., Kangwa, D., & Cai, L. (2023). A systematic literature review of ICT integration in secondary education: what works, what does not, and what next?. *Discover Education*, *2*(1), 44.

27. Naigrum, A. P. S., Yulianti, A. D., Dewi, D.T.E., Mhardika, I. K. and Setiyowati, R. A. (2024). Analysis of the teaching practice. *International Journal of Education, Information Technology and others, 7*(3), 1-10. Do1: 10:528112 enodo, 13369627.

28. Odoh, I.C. (2018). Exploring information and communication technology for the enhancement of leading and learning process in Nigeria tertiary institutions. *Nigerian Journal of Educational Leadership and Management, 2*(1), 259-267.

29. Saba, C. S., Ngepah, N., and Odhiambo, N. M. (2024). Information and Communication Technology (ICT), growth and development in developing region: Evidence from a corporative analysis and a new approach. *Journal of the Knowledge Economy,* 15 (3) 14700-14748. https://doi.org/10.1007/s13132-023-01571-8.

30. Tahsin, F., Armas, A., Kirakalaprathapan, A., Kadu, M., Sritharan, J., & Steele Gray, C. (2023). Information and Communications Technologies Enabling Integrated Primary Care for Patients With Complex Care Needs: Scoping Review. *Journal of Medical Internet Research*, *25*(1).

31. Tetzlaff, J., Lomberk, G., Smith, H. M., Agrawal, H., Siegel, D. H., & Apps, J. N. (2022). Adapting mentoring in times of crisis: what we learned from COVID-19. *Academic Psychiatry*, *46*(6), 774-779.

32. Vaillant, D. (2015). School leadership, trends in policies and practices, and improvement in the quality of education. *Education for All Global Monitoring Report*, *1*, 1-15.

33. Walter, Y. (2024). Embracing the future of Artificial Intelligence in the classroom: the relevance of AI literacy, prompt engineering, and critical thinking in modern education. *International Journal of Educational Technology in Higher Education*, *21*(1), 15.Yuwono, T., Suroso, A., & Novandari, W. (2024). Information and communication technology in SMEs: a systematic literature review. *Journal of Innovation and Entrepreneurship*, *13*(1), 31.

34. Zaifada, B.I,, & Ebuk, L.E. (2020). LEADERS' STRATEGIES TO ATTAIN SUSTAINABLE DEVELOPMENT GOAL FOUR AMIDST THE COVID 19 PANDEMIC PERIOD IN SECONDARY SCHOOLS, GWAGWALADA AREA COUNCIL ABUJA, NIGERIA. *Journal of African Sustainable Development (JASD) 17* (2), 37-48.