

ARTIFICIAL INTELLIGENCE (AI) AND TEACHERS JOB PERFORMANCE IN PUBLIC SECONDARY SCHOOLS IN NORTH EAST SENATORIAL DISTRICT IN AKWA IBOM STATE, NIGERIA

Thomas, Nkoyo A.* & Ekaobong Akan Thomas**

ABSTRACT

The study on Artificial Intelligence (AI) and teachers' job performance was carried out in public secondary schools in North East senatorial district of Akwa Ibom State, Nigeria. To guide the study, two research questions and two null hypotheses were formulated. The co-relational research design was used for the study. The population of the study consisted of all the 2982 teaching staff in the 89 public secondary schools in North East Senatorial district of Akwa Ibom State during the 2023/2024 academic year. Multistage procedure involving clustered, simple random and proportionate stratified sampling techniques were used in selecting the 539 teachers for the study. Data was collected using a researcher developed instrument named, "Artificial Intelligence Questionnaire (AIQ) and Teachers' Job Performance Questionnaire" (TJPQ). The instruments were subjected to face validity by three (3) experts. The reliability of the AIQ and TJPQ were determined using Cronbach Alpha Statistics and Reliability Coefficient of .88 and .83 were obtained respectively. The research questions were answered and the null hypotheses were tested at 0.05 level of significance using Pearson Product Moment Correlation Statistics. All the null hypotheses were rejected. The findings of the study revealed that teachers' awareness and utilization of artificial intelligence significantly influenced their job performance in public secondary schools. Recommendations were made amongst others that Government should organise workshops for teachers on artificial intelligence since it could help enhance their job performance and teachers should utilize the knowledge of AI as this can bridge unemployment and eradicate poverty amongst the youths.

Keywords: Artificial Intelligence (AI), teachers' awareness of artificial intelligence (AI), teachers' utilization of artificial intelligence (AI) and job performance.

Introduction

Digitalization concerns the changes that technology could induce in the delivery of educational content from early childhood to adulthood. Integrating insights from the Organisation for Economic Co-operation and Development's (OECD) Report (2021) on learning analytics, robotics, and machine learning, this discussion delves into the transformative potentials of digitalization in education across short, medium, and long-term horizons. With particular focus on the burgeoning developments in Computer Assisted Instructions (CAI), learning analytics, robotics, and related fields, this study aims at scrutinizing the evolving dynamics of teaching and learning. The exploration of these digitalization technologies specifically considers how these might be assumed by computers or robots in the educational landscape. (Jonah, Duru, Akpanukoh & Thomas, (2023). Nevertheless, as more advanced computer programs emerge for educational purposes, there is a present transition towards a more intricate digitalization referred to as Artificial Intelligence (AI). This AI is now finding application in the education sector while contributing to the ongoing advancements within the context of the Fourth Industrial Revolution (Industry4.0) (Adelana&Akinyemi,2021).

Artificial Intelligence (AI) is defined as the computer's capacity to perform task related processes that require logical conclusions such as perceiving, interpreting, generalizing learning through past experiences and finding solutions like humans in the face of a given problem (Ferikoğlu & Akgün, 2022). Chassignol, Khoroshavin, Klimova and Bilyatdinova (2018) also defined AI as a field and as a theory. As a field of study, Ferikoglu et al (2022), Chassignol et al (2018) as well as Itighise & Thomas (2022) defined AI as a study area in Computer Science versed with the aim of solving different cognitive problems commonly associated with human intelligence, such as learning, problem-solving, pattern recognition and subsequently adaptation. As a theory, (Moffat, Thomas, & Umana (2023) defined AI as a framework that guides the development and use of computer systems within the capabilities of human beings, particularly, the ability to perform tasks that require human intelligence including: visual perception, speech recognition, decision-making and semantic translation. To Moffat et al (2023), Artificial Intelligence has implications in disciplines like Education, Law, Science, Divinity etc.

The purpose of Artificial Intelligence in education as opined by Kış (2019) & Thomas & Ere (2017) is to ameliorate the traditional classroom education and enhance the capacity of teachers to

augment traditional process with digitalization process. To Kis, Thomas & Ereh, Artificial Intelligence is a great contributor to many stages of the teaching process. It deals with routine work such as homework, examination checks, missing topics, and other student's academic achievements. The integration of AI in education according to Ukoh & Nicholas (2022) has been long in existence especially in the developed world and has undergone lots of developmental stages with undeniable evidences of its numerous benefits. Administrators, teachers and learners are strong beneficiaries of this integration. To Thomas & Thomas (2016), Chesser, (2013) & Thomas & Inyang (2021), the integration of AI in education takes the form of web-based teaching and learning platforms, like instructions leveraging technologies such as virtual reality, gamification, animation, web-based platforms, interactive video, simulations, robotics, video conferencing, audio visual files and 3-D technology, virtual labs, computer programming, facial recognition systems, social media-social network sites, micro blogging systems and mobile applications which if integrated will become an acquired skill which will sustain the students against poverty and unemployment.

To Thomas & Thomas (2025), the benefits of AI in education are enormous, to wit:

- It makes for inclusive and global classroom possible (Marr, 2020; Thomas, 2014). with AI, instruction is placed on-line AI makes web-based information learning available to all.
- It helps students overcome social, physical, race, gender as well as international boundaries.
- It facilitates Virtual reality- which is one of the basic components of AI as it facilitates the learning process beyond the learning space to create a global classroom, since AI can connect students to the virtual classroom (Ukoh & Nicholas, 2022).
- Teachers are optimally assisted to make good lesson planning, good preparation which is equipped with appropriate learning materials to facilitate sound learning, (Lynch, 2016 & Thomas (2021).
- AI also aid students to achieve interactive and personalized learning within the shortest possible time. (Akgun & Greenhow, 2022). It reduces the abstract nature of the subject by enhancing learners' engagement and interactions with learning materials. (Thomas & Thomas, 2016).
- It also provides good learning support for social and cognitive development of the teachers and students (Fiokedu & Asuquo, 2016).
- Tracking and assessment of learning could also be done much easier and effective with AI tools.

Incorporating AI technology into teaching can benefit teachers by improving the content design, optimizing the teaching process, and evaluating teaching more comprehensively. Some teachers may be afraid of redundancy leading to retrenchment, while others may rely too heavily on it, resulting in a serious decline in their own teaching skills and lack of self-reflection (Wang et al, 2020). However, it is crucial for teachers to recognize and embrace the benefits of AI and incorporate it into their teaching methods for enhanced students' learning. Teachers' roles have evolved beyond imparting knowledge and skills, they now occupy a more powerful and unique role in the learning process and that include: acting as “instruments” to cultivate students' ideals, beliefs, thinking, emotions, willpower, courage, reflection, introspection, creativity, innovation, imagination, and aesthetics.

Though teachers may not be experts in all disciplines, they must possess the capacity to stimulate students' interest in learning as well as establish new learning experiences to address their learning challenges. They must be proficient in educational technology, explore the value of human-machine dialogue in education, construct an intelligent learning environment and collaborate with AI to enhance their learning experience. Teachers being the centre of educational activities require an indebt knowledge of AI, but despite the great potentials offered by AI, it's extensive use in education may not guarantee teachers' ability to employ it in the classroom, and neither does it guarantee the quality of teaching because so many teachers may not be equipped with the required knowledge to implement AI-based teaching (United Nations Educational, Scientific and Cultural Organization, 2023). To achieve a symbiosis between humans and machines in this era of AI, focus should shift from “targeted education” to “meaningful learning,” supporting human teachers to play a unique role in educating people (Qiu & Li, 2023; Yang, 2023). Through this collaboration, teachers can leverage the natural processing power of AI to communicate effectively with students and provide them with constructive feedback.

The use of AI for understanding the complexities of teaching in Nigerian secondary schools and the essential role it plays in the technological advancement of the society cannot be overemphasized. With all its benefits in the technological advancement of the society, Nigeria has not really enjoyed much

of it, especially in the area of its adoption for teaching and learning in Nigerian secondary schools (Ukoh et al (2022) & Thomas & Thomas (2025). This is because the knowledge of artificial intelligence has not been fully localized and utilized. Mahmoud (2020), Ozurumba & Thomas (2014), Alkanaa (2020), Udo & Thomas (2023) recommended the necessity of employing AI in educational institutions, raising awareness of its positive effects in teacher's development and utilization of AI.

The utilization of artificial intelligence for teaching and learning in some Nigerian secondary schools is still at its infant stage, indeed, students' learning outcomes is just on the average. This has constituted a source of worry to stakeholders of education in Nigeria. Hence, while planning on the mitigating steps that will trigger a change process, there is also a dire need to consider the level of awareness, utilization, competence as well as perception of the people who will implement the change (Ferikoğlu & Akgün, 2022). There is also a dire need not only for the contributions of artificial intelligence to the education system but also for ascertaining its usage as well as the awareness of teachers who play one of the leading roles in the teaching process and drawing a roadmap for the steps that can be taken to fulfill such an end.

Edet, Akpan & Thomas (2024) has revealed that some secondary schools have implemented AI for teaching and learning of some abstract educational concept in North East Senatorial District, hence, the present study assumed that there might be some hindering factors on the adequate use of artificial intelligence in secondary schools in North East Senatorial District and these includes: level of teachers' awareness of AI and teachers' level of utilization of AI tools for teaching and learning. The study on Artificial Intelligence (AI) and teachers' job performance in public secondary schools in North East Senatorial District, Akwa Ibom State sought to determine the relationship between teachers' awareness and utilization of AI and job performance in public schools in North East Senatorial District, Akwa Ibom State.

Umoren (2019), Akpan, Udofia & Thomas (2016) conducted an empirical study on "artificial intelligence awareness and teachers' work performance" in Calabar Education zone. Four null hypotheses were tested in the course of the study. Co-relational research design was adopted, while purposive sampling technique was used in selecting a sample of 800 teachers. Two instruments were used for data collection including "Artificial Intelligence Awareness Questionnaire (AIAQ)," and Teachers' Work Performance Questionnaire (TWPQ)." Pearson Product Moment Correlation Analysis (r) and multiple regression (R) analysis were employed to test the hypotheses at .05 level of significance were applicable, with the aid of SPSS v21. Findings revealed that; artificial intelligence awareness significantly relates to teachers' work performance in terms of instructional delivery, attendance to classes, notes writing, and record keeping respectively.

Okoye (2018), Moffat, Thomas & Umanah (2023) also conducted a study to determine the utilization of artificial intelligence and teachers' job performance. The study was carried out in Secondary Schools in Awka Education Zone of Anambra State. Descriptive survey research design was adopted for the study and two research questions were raised to guide the study. Two null hypotheses were tested at 0.05 level of significance. The population consisted of 57 Principals and 1639 teachers altogether 1696. The entire 57 Principals' and 500 teachers were drawn through stratified random sampling technique, making a total of 557 subjects that participated in the study. Stratification was based on the already existing local government areas. Data collection was done using structured questionnaire of 20 items, which was validated by experts. A total reliability index of 0.81 was obtained using Cronbach alpha co-efficient. Out of 557 copies of the instrument distributed, 555 representing 99% return rate were dully filled and retrieved. Data analysis was done using mean and standard deviation, while the hypotheses were tested using z-test at 0.05 level of significance. The findings revealed among others that utilization of artificial intelligence significantly influence teachers' job performance.

Statement of the Problem

The persistent and prolonged poor state of teachers' job performance and increasing rate of poor academic achievement of secondary school students in Akwa Ibom East Senatorial District indicates teachers' inadequacy in provision of professional guidance and assistance to students for an enhanced academic performance. Most secondary school teachers in Akwa Ibom State North East Senatorial District seem to spend more of their official hours on other duties to the detriment of school duties which is their primary assignment. Ideally, the advent of technology is expected to promote teachers' job performance in education, thus it is the expectation of the stakeholders (government, parents and even

students) to ensure that quality education is received by students in secondary schools through the adoption of technology by the teachers.

However, observations have shown that most teachers have poor knowledge of the utilisation of technology while some miss classes due to insufficient teaching resources and lack of knowledge in the use of technology and all these has culminated to their poor job performance in secondary schools in Akwa Ibom State North East Senatorial District. The researcher considered if technology such as artificial intelligence could solve the problem of poor job performance among teachers. Based on the above limelight, the problem of this study was to determine the relationship between artificial intelligence and teachers' job performance in public secondary schools in North East Senatorial District, Akwa Ibom State. Specifically, how the knowledge of Artificial Intelligence (AI) can influence teachers' job performance in public secondary schools in North East Senatorial District of Akwa Ibom State of Nigeria.

Purpose of the Study

The purpose of this study is to determine the relationship between Artificial Intelligence (AI) and teacher's job performance in public secondary schools in North East Senatorial District. Specifically, this study sought to:

- i. Determine the relationship between teachers' awareness of artificial intelligence and their job performance in public secondary schools.
- ii. Examine the relationship between teachers' utilization of artificial intelligence and their job performance in public secondary schools.

Research Questions

The following research questions were raised for the study:

- i. What is the relationship between teachers' awareness of artificial intelligence and their job performance in public secondary schools?
- ii. What is the relationship between teachers' utilization of artificial intelligence and their job performance in public secondary schools?

Hypotheses

The following null hypotheses were formulated for the study:

- i. There is no significant relationship between teachers' awareness of artificial intelligence and their job performance in public secondary schools.
- ii. There is no significant relationship between teachers' utilization of artificial intelligence and their job performance in public secondary schools.

Research Method

The Co-relational research design was adopted for the study. This design has crucial importance that must be applied in any investigation that is directly aimed at prediction of criterion variables on the basis of known value of predictor variables (Kpolovie, 2016). The study was conducted in secondary schools in North East senatorial district of Akwa Ibom State. The population of the study comprised of the 2982 teaching staff in the 89 public secondary schools and in North East Senatorial District of Akwa Ibom State in 2023/2024 academic year. (Akwa Ibom State Secondary Education Board, Uyo, 2024). The sample size for this study was 539 teachers. A multistage procedure involving clustered, simple random and proportionate stratified sampling techniques was used in obtaining the sample for the study.

Two researcher-made instrument titled "Artificial Intelligence Questionnaire (AIQ) and Teachers' Job Performance Questionnaire" (TJPQ) was used for data collection. The AIQ consisted of two Sections (A and B). Section 'A' contained items on demographic details of the respondents while Section 'B' contained 25 items on different perceived artificial intelligence such as utilization and awareness. Each of the artificial intelligence had five items. AIQ contained 10 items on teachers' job performance. The instruments were scored using a five point rating scale as shown below: Very High Extent (VHE)= 5 points, High Extent (HE)= 4 points, Moderate Extent (ME)= 3 points, Low Extent (LE)= 2 points and Very Low Extent (VLE) = 1 point. The instruments were subjected to face validity by three experts. Two of the experts were from the Department of Educational Management and Planning and one in Measurement and Evaluation from the Department of Psychological Foundations, University of Uyo.

The experts' suggestions and comments were incorporated in the final copy of the instrument used for data collection. To determine the internal consistency of the instrument, the researcher randomly selected 35 teaching staff from one public secondary school in the North East Senatorial District of Akwa Ibom State who was part of the population but not part of the study sample to respond to the instrument. Data generated was subjected to inter-item analysis using Cronbach Alpha Statistics and the reliability coefficients of .88 and .83 were obtained for AIQ and TJPQ respectively. The Data collected was analyzed using Pearson Product Moment Correlation (PPMC) Statistic.

RESULTS

Research Question 1: What is the relationship between teachers' awareness of artificial intelligence and their job performance in public secondary schools?

Table 1: Pearson Product Moment Correlation between teachers' awareness of artificial intelligence and their job performance in public secondary schools.

Variables	N	r	Remark
Teachers' awareness of artificial intelligence	539	.915	Very Strong Positive Relationship
Job performance	539		

Source: Computed by the Researcher using data from the respondents.

From the result in Table 1, it is revealed that r-value is .915. This implied that there is a very strong positive relationship between teachers' awareness of artificial intelligence and their job performance in public secondary schools. This means that as teachers' awareness of artificial intelligence increase, their job performance in public secondary schools also increase very strongly. Therefore, teachers' awareness of artificial intelligence could enhance their job performance in public secondary schools.

Research Question 2: What is the relationship between teachers' utilization of artificial intelligence and their job performance in public secondary schools?

Table 2: Pearson Product Moment Correlation between teachers' utilization of artificial intelligence and their job performance in public secondary schools

Variables	N	r	Remark
Utilization awareness of artificial intelligence	539	.887	Very Strong Positive Relationship
Job performance	539		

Source: Computed by the Researcher using data from the respondents.

From the result in Table 2, it is revealed that r-value is .887. This implied that there is a very strong positive relationship between teachers' utilization of artificial intelligence and their job performance in public secondary schools. This means that as teachers' utilization of artificial intelligence increases, teacher's job performance in public secondary schools also increased very strongly. Therefore, teachers' utilization of artificial intelligence could enhance their job performance in public secondary schools.

Null Hypothesis One (H_{01})

There is no significant relationship between teachers' awareness of artificial intelligence and their job performance in public secondary schools.

Table 3: Result of Pearson Product Moment Correlation for teachers' awareness of artificial intelligence and their job performance in public secondary schools

Variables	N	p-cal	p-crit	Remark
Teachers' awareness of artificial	539	.000	.05	Significant H_{01} Rejected

intelligence

Job performance 539

df=537

Source: Computed by the Researcher using data from the respondents.

From the result in Table 3, it is revealed that the p-cal of .000 is less than the .05 alpha level of significance with 537 degrees of freedom. This showed that the formulated null hypothesis was rejected. Therefore, there is a significant relationship between teachers' awareness of artificial intelligence and their job performance in public secondary schools.

Null Hypothesis Two (H₀₂)

There is no significant relationship between teachers' utilization of artificial intelligence and their job performance in public secondary schools.

Table 4: Result of Pearson Product Moment Correlation for teachers' utilization of artificial intelligence and their job performance in public secondary schools

Variables	N	p-cal	p-crit	Remark
Teachers' utilization of artificial intelligence	539	.000	.05	Significant H ₀₂ Rejected
Job performance	539			

df=537

Source: Computed by the Researcher using data from the respondents.

From the result in Table 4, it is revealed that the p-cal of .000 is less than the .05 alpha level of significance with 537 degrees of freedom. This showed that the formulated null hypothesis was rejected. Therefore, there is a significant relationship between teachers' utilization of artificial intelligence and their job performance in public secondary schools.

Summary of the Findings

The findings of the study revealed the following:

- There is a significant relationship between teachers' awareness of artificial intelligence and their job performance in public secondary schools.
- There is a significant relationship between teachers' utilization of artificial intelligence and their job performance in public secondary schools.

Discussions of the Findings

The result of hypothesis one revealed that, there is a significant relationship between teachers' awareness of artificial intelligence and their job performance in public secondary schools.

The result also revealed that there is very strong relationship between teachers' awareness of artificial intelligence and their job performance in public secondary schools. This finding indicated that job performance in public secondary schools depends on teachers' awareness of artificial intelligence. This finding could be attributed to the fact that Teachers' awareness of artificial intelligence (AI) significantly influences their job performance in public secondary schools due to its transformative impact on education. As AI technologies become increasingly integrated into the educational systems, educators must comprehend its capabilities and implications to effectively adapt their teaching methods and curriculum. Additionally, awareness empowers teachers to leverage AI tools for personalized learning experiences, tailored to students' needs and learning styles, enhancing engagement and comprehension. Moreover, understanding AI equip educators to address the ethical and social implications of its use in education, fostering responsible AI integration while safeguarding students' privacy and autonomy. Lastly, teachers with awareness of AI can effectively incorporate digital literacy and critical thinking skills into their lessons, preparing students to navigate the AI-driven world effectively.

The result of this finding agrees with the finding by Umoren (2019) & Akpan, Udofia & Thomas (2016) and Kpoiovie (2016) whose reports showed that artificial intelligence (Advanced Technology

Literacy) awareness significantly influence teachers' work performance" in Calabar Education zone and its environs.

The result of hypothesis two revealed that, there is a significant relationship between teachers' utilization of artificial intelligence and their job performance in public secondary schools as reiterated by Alkanan (2020) as well Thomas & Thomas (2025) on the necessity and imperatives of government developing teachers versed with the knowledge of AI.

The result also revealed that there is very strong relationship between teachers' utilization of artificial intelligence and their job performance in public secondary schools. This finding indicated that job performance in public secondary schools depends on teachers' utilization of artificial intelligence. This finding could be attributed to the fact that through the integration of AI-powered tools and platforms, educators can personalize learning experiences, cater for diverse students' needs, and optimize instructional strategies. By leveraging AI-based adaptive learning systems, teachers can tailor content delivery to individual student abilities, preferences, and learning paces, thereby maximizing student's comprehension and retention as opined by Thomas (2021) and John, Utibe, Thomas & Paul (2024). Additionally, AI-powered tutoring systems can provide real-time feedback and support, allowing teachers to address students' learning gaps more effectively. Lastly, AI enables educators to analyze vast amounts of educational data to identify trends, patterns, and areas for improvement in student performance. The result of this finding agrees with the finding by Okoye (2018) & Moffat, Thomas & Umanah (2028) who are of the opinion that artificial intelligence utilization significantly influence teachers' job performance in Secondary Schools in Awka Education Zone.

Conclusion

Based on the findings of the study, it is hereby concluded that teachers' awareness and utilization of artificial intelligence significantly relate with their job performance in public secondary schools.

Recommendations

Based on the findings and the conclusions reached, the following recommendations were made:

Government should organise workshops and training for teachers on artificial intelligence since it could help enhance their job performance. Teachers should with discipline, utilize the knowledge of artificial intelligence into their daily activities in the schools for enhanced job performance.

***THOMAS, NKOYO A.
FACULTY OF EDUCATION
AKWA IBOM STATE UNIVERSITY
IKOT AKPADEN**

&

****EKAOBONG AKAN THOMAS
DEPARTMENT OF CRIME MANAGEMENTSCHOOL OF BUSINESS & MANAGEMENT
AKWA IBOM STATE POLYTECHNIC
IKOT OSURUA**

REFERENCES

- Adelana, B. A. & Akinyemi, I. O. (2021). Artificial intelligence in education: Advancements within the context of the Fourth Industrial Revolution. *Journal of Educational Technology*, 38(3):124-139.
- Akgun, Ö. E. & Greenhow, C. (2022). Personalized learning with artificial intelligence: Opportunities and challenges. *Computers & Education*, 174:1-15.
- Akpan, I. F., Udofia, S. E. & Thomas, N. (2016). Innovative Use of ICT in Science Teacher Education for Sustainable National Development. *Journal of Educational Media and Technology*, 20 (1): 37-45.
- AlKanaan, R. (2020). Preparing teachers for the AI revolution in education. *Teacher Development*, 24(3):412-428.
- Nkoyo A. Thomas & Ekaobong Akan Thomas (2025). Administrative Intelligence (AI) and Administrator's Job Productivity in Public Secondary Schools in North East Education District in Akwa Ibom State, Nigeria. *African Journal of Educational Research and Development (AJERD)*, 16 (1): 150-168.
- Chassignol, M., Khoroshavin, A., Klimova, A. & Bilyatdinova, A. (2018). Artificial intelligence in education: Theory and application. *International Journal of Emerging Technologies in Learning (iJET)*, 13(6):104-119.
- Chesser, I. J. (2013). Personalized learning with artificial intelligence: Opportunities and challenges. *Computers & Education*, 174:1-15.
- Edet, Caroline G, Akpan, Iniobong & Thomas, Nkoyo A, (2024) Effect of Instructional Materials and School Location on Student's Academic Performance in Biology in Akwa Ibom State, Nigeria. *Inter-disciplinary Journal of Science Education (IJ-SED)*, 5(1), 63-72.
- Ferikoğlu, B. & Akgün, Ö. E. (2022). Understanding artificial intelligence in education: Definitions and implications. *International Journal of Educational Technology in Higher Education*, 19(1):1-15.
- Ferikoğlu, B. & Akgün, Ö. E. (2022). Utilization of artificial intelligence in Nigerian secondary schools: Challenges and prospects. *Nigerian Journal of Educational Technology*, 19(2):88-102.
- Fiokedu Sam Okorie & Asuquo Thomas Nkoyo (2016). Relevance of information technology (ICT) in the administration of primary schools in the rural area in Nigeria. *Academic Scholarship Journal*, 13 (1), 1-6.
- Itighise, A. E. & Thomas, N. (2022). Information and Communication Technology Skills Acquisition in Science Education Teachers Training Programme: Imperative for Self-Reliance. *Academic Scholarship Journal*, 18(1): 1-13.
- John, Ito I, Uduak, Utibe J, Thomas, Nkoyo A. & Paul Ubong –Abasi (2024), Teachers' Instructional Approaches and Students Development in Science Process skills in physics in Ibiono Ibom local government area, Akwa Ibom State, Nigeria. *Journal of center for distance and e-learning(JCDeL)*, Vol. 3(1) P 79-89.
- Jonah, Glory E., Duru, Chukwudi M., Uwem Akpanukoh I. & Thomas, Nkoyo A. (2023). Perception of teachers' motivational variables and student's academic achievement in Biology in Akwa Ibom State, Nigeria. *Inter-Disciplinary Journal of Science Education (IJ-SED)*, 5(1), 90-97.

- Kıř, T. (2019). The role of artificial intelligence in education. *Journal of Educational Technology & Society*, 22(4):154-163.
- Lynch, M. (2016). Enhancing teaching with artificial intelligence: A practical approach. *Journal of Teaching and Teacher Education*, 58:145-155.
- Mahmoud, E. (2020). Bridging the AI knowledge gap in education: Recommendations for policy and practice. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 16(2):127-142.
- Marr, B. (2020). Leveraging AI for inclusive and global classrooms. *Educational Technology & Society*, 23(1):192-205.
- Moffat, U. S., Thomas, Nkoyo A., Umanah, Felicia I. (2023). Media Devices and Student's Academic Achievement in Biology Among Co-Educational Secondary Schools in Eket Local Government Area, Akwa Ibom State, Nigeria. *Journal of Research in Education and Society*. 14(2): 71-79.
- Okoye, C. (2018). Utilization of artificial intelligence and teachers' job performance in Secondary Schools in Awka Education Zone of Anambra State. *Journal of Educational Technology & Society*, 21(3): 212-225.
- Ozurumba, C. N. & Thomas, Nkoyo A. (2014). Refocusing Higher Education Research for Sustainable Development. *Developing Country Studies*, 4(15), 84-91.
- Qiu, Z., & Li, L. (2023). Achieving symbiosis between humans and machines in education: Shifting focus from targeted education to meaningful learning. *British Journal of Educational Technology*, 54(2):587-602.
- Thomas, Nkoyo, A. & Thomas, Ekaobong, A. (2016). Science educators' graduate unemployment as a threat to global peace and security. *International Journal of Research in Basic and Lifelong Education*, 5:122-129. Uncial, Press: Calabar.
- Thomas, Nkoyo A. & Ereh, Cecilia Emuji (2017). Benchmark as a Quality Indicator Tool for Educational Administrators in Quality Management and Improvement of Higher Education in Nigeria. *African Journal of Educational Research and Development (AJERD)*, 9(1), 373-380.
- Thomas, Nkoyo, A. (2014). Education for global competitiveness: Need for secondary schools in Akwa Ibom State to assure global competitiveness. *International Journal of Research in Basic and Lifelong Education*, 4, 141-148.
- Thomas, N. A. & Inyang, M. I. (2021). Teacher's Effectiveness Strategies and Students Attitude to Learning in Public Secondary Schools in Akwa Ibom State, Nigeria. *International Journal of Progressives and Alternative Education (ASPROAEDU)*, 7(1): 195-205.
- Ukoh, U., & Nicholas, D. (2022). Integrating artificial intelligence in education: Benefits and challenges. *Journal of Information Technology Education: Research*, 21:195-210.
- Thomas, Nkoyo A. & Thomas, Ekaobong Akan (2025). Kakistocracy and Administrators' Professional Development in the 21st Century Secondary Schools in North East Senatorial District of Akwa Ibom State, Nigeria. *AKSU International Journal of Research in Education (AKSUIJRE)*, 1(1).
- Umoren, U. (2019). Artificial intelligence awareness and teachers' work performance in Calabar Education zone. *Journal of Educational Research and Development*, 9(1):45-58.

- United Nations Educational, Scientific and Cultural Organization. (2023). The future of education: Harnessing artificial intelligence for sustainable development. Paris: UNESCO.
- Vincent-Lancrin, S., Cobo-Romani, R., & Reimers, F. (2022). Exploring the impact of digitalization on education: Reshaping roles of teachers and students. *Journal of Educational Technology Research and Development*, 70(1):265-283.
- Wang, Y., et al. (2020). Embracing artificial intelligence in education: Opportunities and challenges for teachers. *Educational Sciences: Theory & Practice*, 20(1):58-76.
- Yang, J. (2023). The evolving role of teachers in the AI era: From knowledge imparting to value cultivation. *Journal of Educational Technology & Society*, 26(3):241-254.