Delta Journal of Computing, Communications & Media Technologies (DJCCMT)
Journal platform–https://focjournals.dsust.edu.ng

Digital Literacy Among Lecturers in the Age of Artificial Intelligence: A Case Study

Ogochukwu T. ***Emiri***
Department of Library and Information Science, Southern Delta University, Ozoro, Nigeria

Osaze Patrick ***Ijiekhuamhen***
University Library, Federal University of Petroleum Resources Effurun, Nigeria

Wilson ***Nwankwo***
Department of Cyber Security, Southern Delta University
Ozoro, Nigeria

ARTICLE INFO

Article history:
Received October 2024
Received in revised form Dec. 2024
Accepted December 2024
Available online Jan 2025

Keywords:
Digital Literacy
Artificial Intelligence
Federal University of Petroleum Resources
Nigeria Maritime University

ABSTRACT

This study examined digital literacy among lecturers in the age of artificial intelligence at the Federal University of Petroleum Resources Effurun (FUPRE) and the Nigeria Maritime University (NMU). Employing a descriptive survey design, the research targeted a population of 545 lecturers and drew a sample of 231 using Yamane's formula. Data were collected via a structured questionnaire—validated and found reliable (r = 0.84)—and analyzed using descriptive statistics (frequencies, percentages, and weighted means). Findings indicate that while lecturers' digital literacy concerning AI is slightly above moderate, their actual use of AI tools remains low. Common applications include research and writing, plagiarism detection, data analysis, presentations, content creation, and idea generation. Key barriers comprise inadequate internet services, limited management support, difficulties integrating AI into traditional pedagogy, time constraints, and high software costs. The study recommends targeted training programs and enhanced institutional support—improved internet access and AI tool subscriptions—to strengthen teaching and research. The insights inform capacity-building strategies in specialized Nigerian universities.

Ogochukwu Emiri.

*Corresponding author.
E-mail address: emirio@dsust.edu.ng ; pastorogo2014@gmail.com

https://doi.org/10.xxx.

1. Introduction

The rapid advent of the Fourth Industrial Revolution has ushered in an era in which advanced digital technologies permeate virtually every sector of the global economy. Among these, artificial intelligence (AI)—defined as computational systems capable of emulating and enhancing complex human cognitive and decision-making tasks—has emerged as a transformative force in education (Sheikh et al., 2023; Nwankwo et al,2023; Olayinka et al,2022; Olayinka et al,2020; Onwodi et al,2024; Igulu et al,2024; Ukurebor et al,2020). AI-driven platforms now underpin several social and economic sectors, adaptive learning environments, real-time feedback mechanisms, and data-informed pedagogical strategies, enabling institutions to tailor instruction to individual learner profiles and thereby elevate educational efficacy (Kamalov et al., 2023, Acheme et al,2023; Adetunji et al,2022; Chinedu et al,2021;Nwankwo, Nwankwo & Adigwe,2022; Nwankwo et al,2022; Nwankwo et al,2024).

Lecturers occupy multifaceted roles—encompassing instruction, research, mentoring, and community engagement—and AI tools are progressively automating many routine aspects of academic work. For instance, algorithmic grading engines, automated assessment frameworks, and report-generation systems have been shown to streamline workload and free educators to focus on higher-order tasks such as curriculum design and scholarly inquiry (Wang et al., 2024). Moreover, intelligent tutoring systems and learning management platforms increasingly integrate AI agents that support personalized content delivery, predictive analytics for student success, and virtual research assistants (Senior College and University Commission, 2021).

Yet, harnessing these advantages is contingent upon lecturers' digital literacy—the ensemble of skills required to locate, evaluate, and deploy digital information and tools effectively (Pangrazio et al., 2020). In this study, digital literacy is conceptualized as the ability to engage with AI-based interfaces, interpret algorithmic outputs, and integrate AI insights into pedagogical and research practices. While prior investigations have examined digital competencies among academic staff, there remains a notable dearth of empirical research focused on specialized universities in Nigeria.

To address this lacuna, the present research assesses the digital literacy of lecturers at two institutions—the Federal University of Petroleum Resources, Effurun, and the Nigeria Maritime University, Okerenkoko—illuminating both the proficiency levels and challenges that influence AI adoption in these specialized educational contexts. This study seeks to understand digital literacy among lecturers in the age of artificial intelligence using two Nigerian specialized universities as the case study. The specific objectives of the study are to:

a) Evaluate the extent of digital literacy possessed by the lecturers in the use of artificial intelligence in the two specialized universities.
b) Measure the extent of the use of artificial intelligence by the lecturers in the two specialized universities.
c) Identify the purposes of the use of artificial intelligence by the lecturers in the two specialized universities.
d) Investigate the challenges militating against the use of artificial intelligence by the lecturers in the two specialized universities.

To achieve the stated objectives, this study addresses the following questions:

a) To what extent do lecturers in the two specialized universities possess the digital literacy required to effectively apply artificial intelligence?
b) To what extent do these lecturers integrate artificial intelligence into their academic practices?

c) For what purposes do lecturers employ artificial intelligence across their teaching, research, and service roles?
d) What barriers hinder the adoption and effective use of artificial intelligence by lecturers in the two specialized universities?

2. Literature Review

2.1 Theoretical Framework

This study is anchored on the Technology Acceptance Model (TAM) developed by Davis (1989). The TAM is one of the most influential theories for understanding the adoption and use of technology. It posits that two primary factors determine users' acceptance of new technologies: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). The Perceived Usefulness (PU) as defined by Davis (1989) refers to the degree to which an individual believes that using a particular technology will enhance their job performance. The Perceived Ease of Use (PEOU) refers to the degree to which an individual believes that using the technology will be free of effort (Davis, 1989). In the context of this study, the TAM helps to explain lecturers' willingness and ability to adopt artificial intelligence tools in their professional activities. A lecturer who perceives AI as useful for teaching, research, mentoring, and administrative tasks, and who finds AI tools easy to use, is more likely to integrate them into daily routines. However, lecturers with low levels of digital literacy may perceive AI as difficult to use, thus hindering their adoption of such technologies.

2.2 Degree of Digital Literacy Among Lecturers for AI Adoption

In a study, Kasinidou et al (2025) assessed thhe digital literacy possessed by Cypriot lecturers in the use of artificial intelligence. The findings indicated that the faculty members possessed intermediate digital and artificial intelligence literacy necessary for deploying artificial intelligence to meet their diverse needs. In yet another study, Goncalves et al (2024a) examined the digital literacy among lecturers in a private university in Timor-Leste. It was revealed in the finding that 58.2% of the respondents indicated they possess the digital literacy necessary to deploy artificial intelligence for meeting their various needs. The digital literacy level for deploying artificial intelligence among lecturers in the faculty of art in Nigeria was examined by Ibrahim (2024). The findings revealed that the lecturers in the faculty of art possessed a moderate level of digital literacy for deploying artificial intelligence to meet their diverse needs. The study specifically recommended the need to develop the digital literacy of lecturers to improve their use of artificial intelligence.

Olatunde-Aiyedun and Hamma (2023) assessed lecturers' digital literacy in the use of Canva, Gamma, and MS PowerPoint at the University of Abuja, Nigeria. The findings indicated that the lecturers are not skilled in the use of the aforementioned artificial intelligence tools and the researchers recommended the need for training programmes to enhance their competencies in the deployment of artificial intelligence. At the University of Applied Sciences in Germany, the findings of a study by Mah and Grob (2024) revealed that the lecturers and students lacked the required digital literacy to deploy artificial intelligence to meet their various needs and many of the participants were interested in self-development programmes to enhance their digital literacy level.

2.3 Extent of AI Integration in Lecturers' Academic Practice

Eze and Onah (2024) explored the deployment of artificial intelligence by lecturers of the public universities in Enugu State, Nigeria. The study revealed that educational artificial intelligence tools, particularly ChatGPT and Chatbot, are extensively utilized by vocational education lecturers in public

universities in Enugu State, Nigeria, for teaching and learning purposes. In Ecuador, Marin and Gomez (2024) examined the implementation of artificial intelligence by university educators, assessing the extent of usage. The findings indicated that the extent of use is still in its infant stages due to a lack of knowledge. At Ambrose Alli University, Ekpoma, Asika and Asika (2024) assessed the extent of the use of artificial intelligence by the lecturers. The findings revealed that artificial intelligence tools were used to a small extent by the lecturers examined. The study highlighted the need to improve the power supply in the university before the full implementation of artificial intelligence at Ambrose Alli University, Ekpoma. Loan and Thuy (2024) examined the application of artificial intelligence by the lecturers of Thu Dau Mot University, Vietnam. The findings indicate that the application of artificial intelligence by the lecturers at Thu Dau Mot University, Vietnam was to a great extent and the application has brought a lot of favourable innovations to the university. In Nigerian universities, Lionel et al (2024) assessed the proficiency level in teaching English and practicing librarianship using artificial intelligence tools. The findings revealed that artificial intelligence is extensively used by the lecturers in the Nigerian universities examined.

2.4 The Purpose of the Use of Artificial Intelligence by Lecturers

In a study by Marin and Gomez (2024) examined the implementation of artificial intelligence by university teachers in Ecuador, particularly how it affects their educational processes. From the findings, the purpose of using artificial intelligence by lecturers in universities is to improve the quality of education, personalize learning experiences, and prepare students for an evolving world, although current implementation is limited due to a lack of knowledge and training. Kotamjani et al (2023) examined Uzbekistan lecturers' views of the use of artificial intelligence for meeting their various goals in Tertiary institutions. From the findings, it was revealed that the lecturers use artificial intelligence for content creation, assessment and feedback, and research. Ezekiel and Akinyemi (2022) examined the use of artificial intelligence by the lecturers of the University of Ibadan. The findings indicate that the purpose of using Artificial Intelligence by lecturers includes enhancing educational methods, improving teaching efficiency, and facilitating personalized learning experiences. Despite some reservations, lecturers at the University of Ibadan are willing to adopt AI to benefit the educational system. In a Timor-Leste private university, Goncalves et al (2024b) looked at artificial intelligence literacy among lecturers. The findings revealed that the purpose of using artificial intelligence by lecturers includes enhancing educational experiences, improving operational skills, and leveraging AI's benefits in teaching. Gandhi and Gani (2024) examined the various purposes of deploying artificial intelligence in research writing by the lecturers in Indonesia. The findings indicate that the purpose of using artificial intelligence by lecturers is to enhance the quality and productivity of writing scientific articles, facilitating tasks such as grammar improvement, summarization, and ensuring information security while addressing concerns about software misuse and plagiarism.

2.5 The Challenges Militating Against the Use of Artificial Intelligence by Lecturers

In a study, Ibrahim (2024) assessed the knowledge and perception of lecturers regarding the integration of artificial intelligence for research and teaching in the faculty of arts in Nigeria. The findings revealed that the challenges militating against the use of artificial intelligence by lecturers include technical barriers, limited resources, and the need for AI systems to understand context and nuance, particularly in fields like literary translation, which complicates effective integration into teaching and research. Also, Abdelaal and Sawy (2024) looked at Egyptian professors' perception, drawbacks, and benefits in the deployment of artificial intelligence for educational purposes. The findings revealed that the drawbacks militating against the deployment of artificial intelligence include difficulties in understanding artificial intelligence algorithmic outcomes, the complex autonomy of AI systems, financial implications of implementation, and concerns regarding data privacy, alongside apprehensions about AI's impact on teaching and professors' roles. At Northern Border University in Saudi Arabia, the findings of a study by Alenezi (2024) revealed

that insufficient support and training were identified as the primary obstacles to AI tool use in Blackboard among faculty members. Additionally, factors such as gender and educational level influenced the adoption of AI tools, highlighting various challenges in integration. Ezekiel, and Akinyemi (2022) study indicated that the University of Ibadan, Nigeria lecturers exhibit a lack of understanding and unease with technology as the major barrier in their use of artificial intelligence. Preston (2024) highlighted in a study that college professors face challenges in integrating artificial intelligence into their teaching style which would result in a shift from their traditional style of teaching, also balancing the use of artificial intelligence to avoid overuse is another challenge faced by professors according to a study.

3. Methodology

3.1 Choice of Methodology

To align with the study's objectives—to assess (1) lecturers' digital literacy for AI application, (2) their extent of AI use, (3) the purposes for which they employ AI, and (4) the challenges they face—a survey strategy was adopted. Surveys enable the systematic collection of standardized data from a clearly defined population, facilitating the quantification of trends and the examination of relationships among variables relevant to our research questions (Bhaskaran, 2023).

3.1.1 Research Design

A descriptive survey research design was employed to capture lecturers' self-reported competencies, behaviors, and perceptions regarding AI. Such a design is ideal when the goal is to depict the current state of phenomena—here, digital literacy levels, AI adoption patterns, usage purposes, and barriers—without manipulating any variables (Salaria, 2012). As Edgar and Manz (2017) note, this approach prioritizes the characterization of variables over hypothesis testing, which is consistent with our intent to answer:

1. To what extent do lecturers possess the digital literacy needed to apply AI?
2. To what extent do they integrate AI into their academic practices?
3. For what purposes do they employ AI?
4. What barriers inhibit their effective use of AI?

By administering a structured questionnaire to lecturers in both institutions, the design ensures direct mapping of each research question to specific survey items, thereby yielding descriptive insights that address all four study questions.

3.1.2 Population and Sampling Strategy

The study population comprised all full-time lecturers at the Federal University of Petroleum Resources, Effurun (n = 254) and the Nigeria Maritime University, Okerenkoko (n = 291), totaling 545 individuals. To ensure representativeness and sufficient statistical power for analyzing each research question:

Sample size determination--Yamane's formula was applied to the full population, yielding a target sample of 231 respondents (with a 95 % confidence level and ±5 % precision).

The Yamane's formula applied is given below:

$$n=N/(1+Ne^2) \qquad (1)$$

Where:

n = Sample Size
N = Population Size
e = Margin of Error (Commonly 0.05 for 95% confidence level)
Given the formula above
N = 545
e = 0.05

$$n = \frac{545}{1+545(0.05)2} = \frac{545}{1+545(0.0025)} = \frac{545}{1+1.3625} = \frac{545}{2.3625}$$

$$n = 231$$

Sampling technique--A proportionate stratified random sampling procedure was used, with strata defined by university and academic rank. This approach guaranteed that both institutions and all lecturer grades were appropriately represented in the final sample.

This sampling strategy supports robust, generalizable findings on digital literacy competencies, AI utilization patterns, stated purposes, and encountered challenges among lecturers in these two specialized universities.

3.1.3 Instrumentation and Measurement

Data were collected using a structured questionnaire specifically designed to address each research question: digital-literacy competencies (RQ1), AI-usage patterns (RQ2), AI-usage purposes (RQ3), and AI-adoption barriers (RQ4). The questionnaire comprises five sections:

1. Section A: Demographics--Age, gender, academic rank, years of teaching experience, and department—used to describe the sample and to explore any demographic effects on AI adoption.
2. Section B: Digital Literacy for AI (4-point Likert scale) --Eight items measuring familiarity with AI interfaces, data interpretation, and ethical use of AI tools (1 = Strongly Disagree; 4 = Strongly Agree).
3. Section C: Extent of AI Use (4-point Likert scale) --Seven items quantifying frequency of AI integration in teaching, research, and service activities (1 = Never; 4 = Always).
4. Section D: Purposes of AI Use--Five closed-ended items (multiple-choice) and two open-ended prompts probing motivations—e.g., "Which of the following best describes your primary purpose for using AI?" followed by "Please describe any other purpose not listed."
5. Section E: Barriers to AI Adoption--Six closed-ended items (multiple-choice) and one open-ended item eliciting perceived obstacles—technological, institutional, or personal.

Validity and Reliability

The content validity was established via expert review by two senior librarians and one AI-in-education specialist, who assessed each item for relevance and clarity; items with a Content Validity Index (CVI) below 0.80 were revised or eliminated. A pilot study with 10 librarians outside the study population yielded Cronbach's alpha = 0.84, exceeding the recommended threshold of 0.70 for internal consistency (Nunnally, 1978), thereby confirming instrument reliability.

3.1.4 Data Collection Procedure

Data were gathered over a three-week period at FUPRE and NMU. After obtaining ethical clearance and institutional permissions, the researchers and three trained research assistants:

i. Introduced the study to departmental meetings, distributed informed-consent forms detailing participants' rights, study objectives, and confidentiality assurances.
ii. Collected signed consent forms before administering the questionnaires in person.
iii. Followed up via reminders to maximize response rate, achieving a final sample of 231 completed instruments (42.4 % response rate).

3.1.5 Data Analysis

Quantitative data (Sections A–C, closed-ended items in D and E) were coded and analyzed in **SPSS v25** using:

i. Descriptive statistics (frequencies, percentages) to profile demographics and barrier prevalence;
ii. Weighted means to rank digital-literacy levels and AI-use intensity (threshold: ≥2.50 indicates moderate-to-high agreement).

Qualitative responses from open-ended items were subjected to thematic analysis:

i. Transcribed verbatim and imported into NVivo;

ii. Coded inductively to identify emergent themes related to novel AI applications and unanticipated challenges;
iii. Triangulated with quantitative findings to enrich interpretation and ensure comprehensive coverage of all four research questions.

4. Results and Discussion

4.1 Questionnaire Response Rate

Table 1 shows the number of questionnaires distributed and th number returned. 231 questionnaires were distributed to the participants, and 228 were retrieved and used for analysis.

Table 1: Questionnaire Response Rate

The number of questionnaires distributed	No of Questionnaire Returned	Percentage of Return
231	228	99%

4.2 Participant Demographic Distribution

The findings in Figure 1 indicate that 55.3% of the participants were male, while 44.7% of the participants were female. This implies that there are more male participants in the study than females.

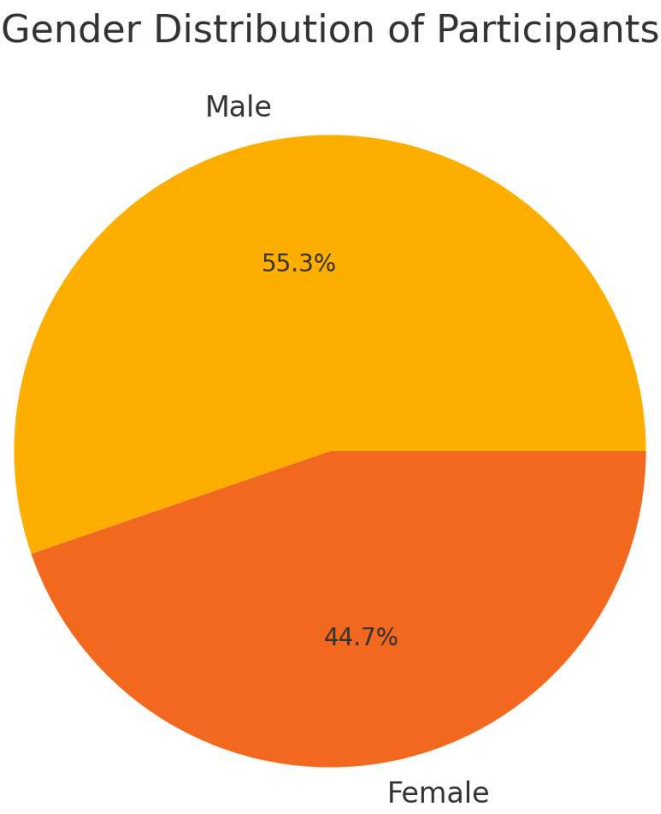

Figure 1: Gender Distribution

4.3 *Lecturers' Digital Literacy in AI*

Figure 2 shows a plot of the Lecturer's digital literacy item means. Overall mean rating across all item-responses was **2.74**, significantly above the criterion of 2.50 (one-sample t-test: t(2279)=10.34, p<.001),

indicating a moderate-to-high level of digital literacy for AI among lecturers. The Item-level means ranged from high competence with basic internet use (M=3.61) and plagiarism-testing software (M=3.38) down to lower proficiency in data analysis with Power BI/Excel (M=2.01) and guiding students in AI (M=2.35).

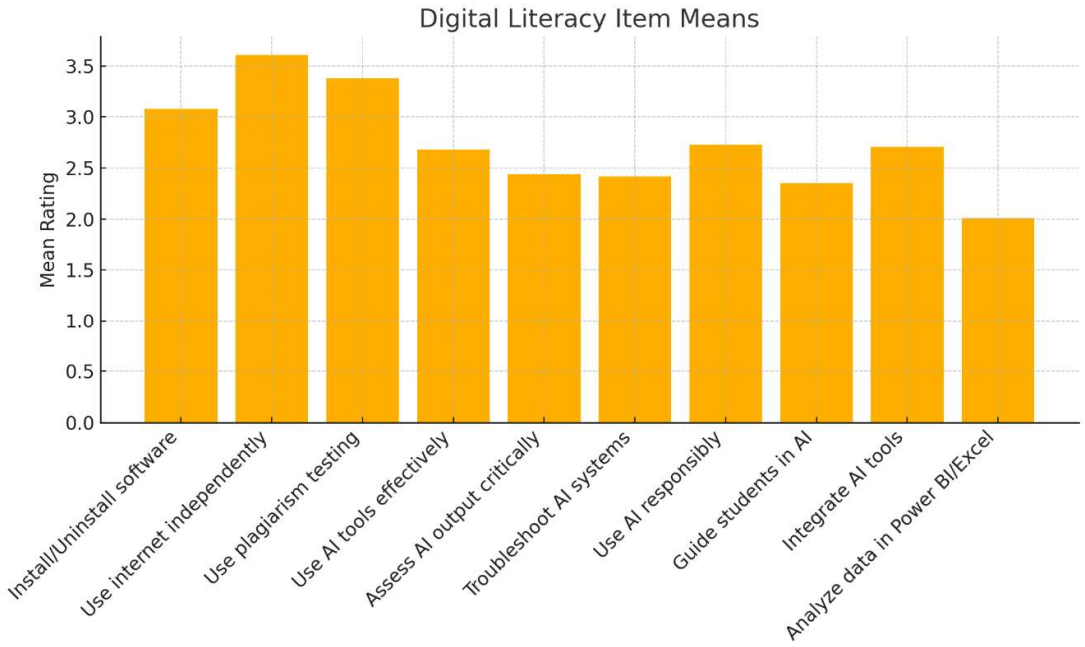

Figure 2: Plot of Lecturer's digital literacy means

4.4 *Extent of AI Adoption by Lecturers*

Figure 3 shows the plot of the mean extent of AI adoption by lecturers. Overall mean rating was 2.48, not significantly different from the 2.50 criterion ($t(2279)=-1.14$, $p=0.25$), suggesting that lecturers' actual AI usage is low to moderate. Highest adoption: using ChatGPT for lesson-planning (M=3.13) and Turnitin for plagiarism/AI-score checks (M=3.00). Lowest adoption: literature search via Perplexity/Scispace (M=2.03), reference-management tools like MyBib/Zotero (M=1.93), and Canva visuals (M=2.04).

Figure 4 is exploratory regression plot **(Item-level), a** simple linear model to predict AI-adoption means from digital-literacy means across the 10 paired items. The yield is given: **Slope** = 0.45, **Intercept** = 1.23, and $\mathbf{R^2}$ = 0.26. The interpretation is that items with higher perceived digital-literacy competence tend to show higher AI-usage, accounting for ~26 % of variance at the item level (limited by aggregated data).

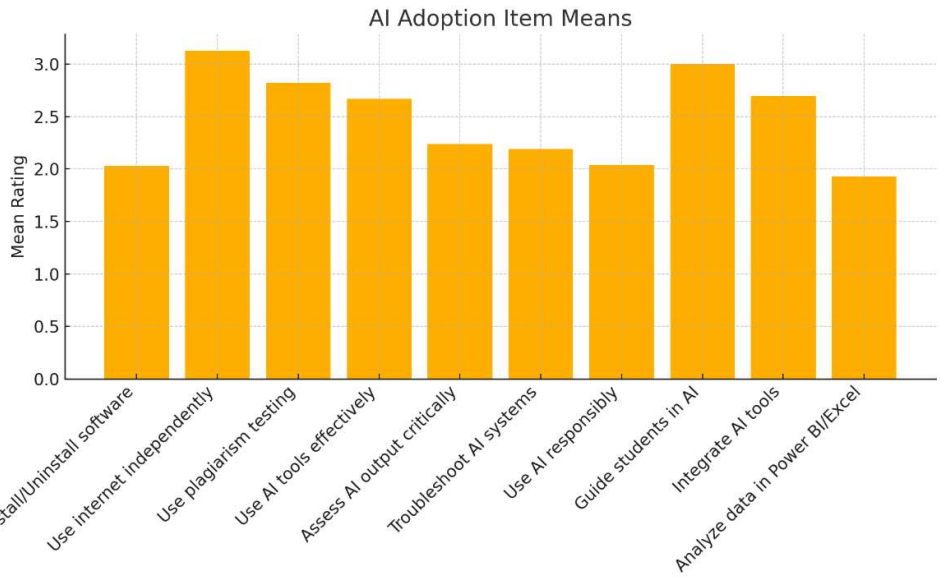

Figure 3: Lecturer's adoption of AI

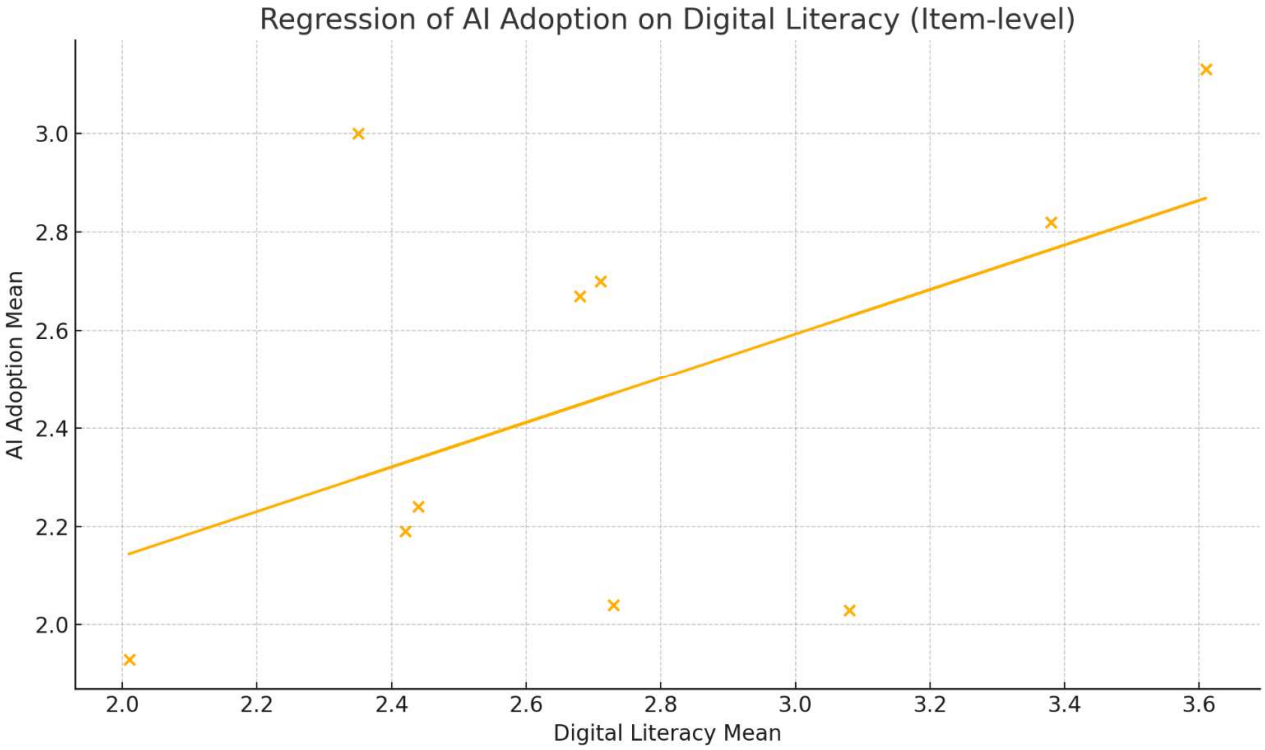

Figure 4: Exploratory regression chart of AI Adoption on Digital Literacy

4.5 *Lecturers' Objectives for Using Artificial Intelligence*

Figure 5 presents the various intentions for which AI is used by the lecturers in the specialised universities. 100 % of lecturers use AI for **research and writing**, followed by plagiarism detection (89 %) and data analysis (76 %). Less frequent purposes (<40 %) include support for students with disabilities (21 %) and automating administrative tasks (14 %).

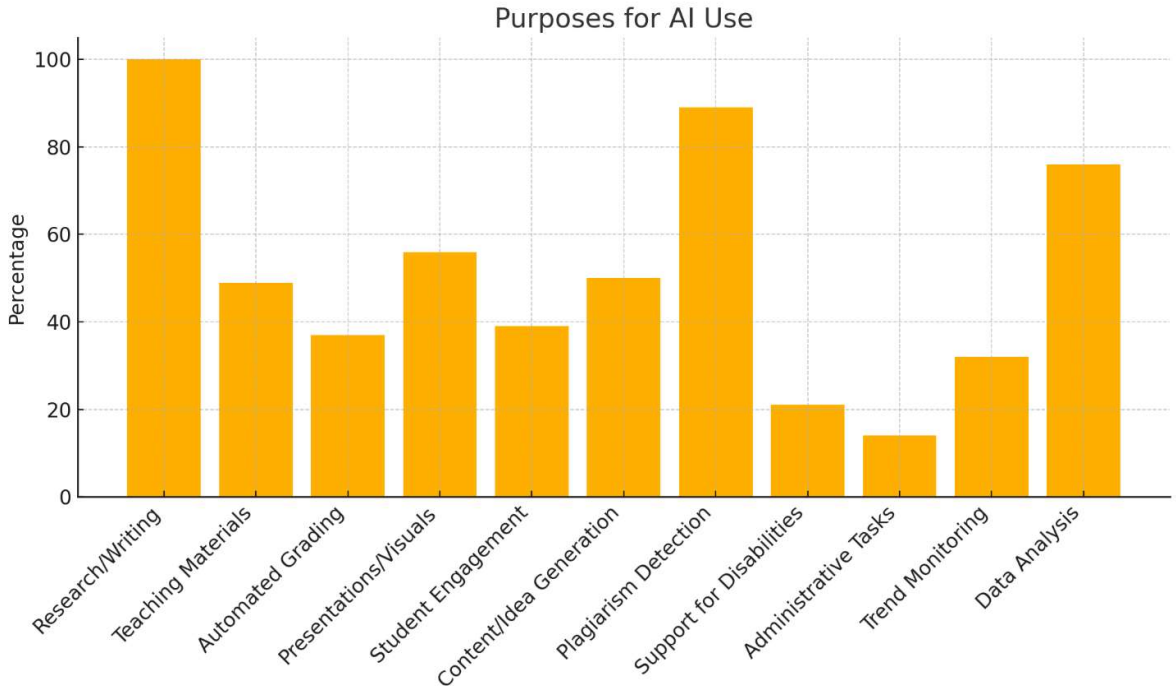

Figure 5: Purposes for AI Use

4.6 *Challenges Militating Against the Use of AI by Lecturers*

As indicated in Figure 6, there are universal barriers (100 %) to AI adoption among the lecturers. These include inadequate internet service, limited management support, and integration issues with traditional teaching styles. Other prominent challenges are: lack of time (94 %), high platform costs (89 %), and erratic power supply (47 %).

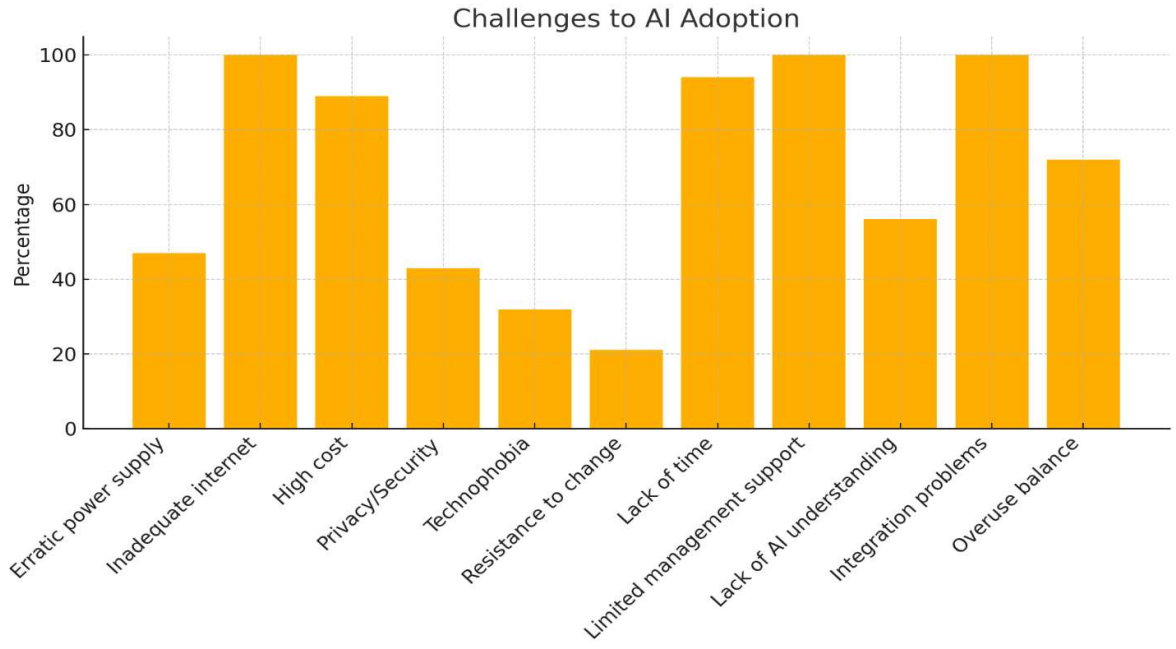

Figure 5: Challenges to AI Adoption

4.7 Implications

Although foundational digital skills are strong among the lecturers, targeted training is needed in advanced data analysis (Power BI/Excel) and pedagogical guidance for AI to boost both digital literacy and application. Another issue is **Infrastructure and Policy Support.** 100 % endorsement of poor internet, power, and managerial encouragement underscores an urgent need for institutional investment in reliable connectivity, power backup, and leadership advocacy. Encouraging the use of under-utilized AI tools (e.g. Perplexity AI for literature review, Zotero/MyBib) could broaden lecturers' engagement beyond core tasks (research/writing), thereby enriching teaching and administrative workflows.

Compared to prior work reporting moderate digital-literacy levels among university lecturers (Gonçalves et al., 2024; Ibrahim, 2024), our finding of an overall mean of 2.74 (on a 1–4 scale) confirms that lecturers in these two specialized Nigerian universities possess slightly above-moderate competence in AI-related skills. However, while Gonçalves et al. (2024) and Ibrahim (2024) stopped at descriptive levels, our one-sample t-test ($t(2279)=10.34$, $p<.001$) statistically validates that this digital-literacy level significantly exceeds the 2.50 benchmark. This suggests that management should build on existing competencies—particularly reinforcing weaker areas such as data analysis ($M=2.01$) and student guidance in AI ($M=2.35$)—to ensure lecturers can fully leverage AI for teaching, research, content creation, assessment, and administrative workflows.

By contrast, the extent of AI adoption in our sample (mean = 2.48) did not differ significantly from the 2.50 criterion ($t(2279)=–1.14$, $p=0.25$), indicating low-to-moderate use. This aligns with findings by Marin and Gomez (2024), who documented nascent AI deployment in Ecuadorian universities, and Asika and Asika (2024), who reported similar low uptake at Ambrose Alli University. Conversely, Loan and Thuy (2024) observed high AI use among Thu Dau Mot University lecturers—a divergence likely attributable to stronger infrastructure and targeted training in that context. Our results therefore underscore that, despite adequate digital-literacy foundations, actual AI integration remains constrained by factors such as inadequate internet, power instability, and limited managerial support (all 100 % endorsement).

Regarding purposes of AI use, our study replicates Gandhi and Gani's (2024) Indonesian findings—100 % of our respondents use AI for research and writing, and 89 % for plagiarism detection—while also revealing robust engagement in data analysis (76 %) and presentation design (56 %). This partly contrasts with Kotamjani et al. (2023), who identified content generation and assessment as Uzbek lecturers' primary AI applications. The broader array of uses observed here suggests that, when infrastructural and training barriers are addressed, lecturers can diversify AI tools to enhance pedagogy, personalize learning, and streamline administrative tasks.

Finally, the challenges we documented—universal concerns over internet reliability, managerial support, and integration into traditional teaching—mirror Alenezi's (2024) Northern Border University results and Preston's (2024) findings on resistance to pedagogical change. Beyond confirming these barriers, our data quantify their prevalence (e.g., 94 % cite lack of time, 89 % cite cost), providing concrete targets for policy intervention. In sum, while digital literacy among these Nigerian lecturers is moderately strong, low AI adoption persists due to systemic constraints; addressing these through enhanced infrastructure, leadership advocacy, and focused professional development will be critical to translating digital-literacy gains into meaningful AI integration.

5. Conclusion

This study demonstrates that lecturers at the Federal University of Petroleum Resources, Effurun, and the Nigeria Maritime University, possess a moderately high level of digital literacy for engaging with AI—an overall mean of 2.74 on a 1–4 scale that significantly exceeds the 2.50 benchmark ($t(2279)=10.34$, $p<.001$). While proficiency is strongest in foundational tasks such as internet navigation and plagiarism checking, it remains relatively weak in advanced areas like data analysis and student mentoring. In contrast, actual AI

adoption is low to moderate (mean = 2.48), with high uptake only for a few tools—ChatGPT for lesson planning and Turnitin for plagiarism detection—while specialized applications such as literature searching, reference management, and visual-design platforms see minimal use. The primary drivers for AI engagement are research and writing (100 %) and plagiarism prevention (89 %), but lecturers report systemic barriers—unreliable internet, insufficient management support, inadequate integration with established teaching practices, and resource constraints—that impede broader tool utilization. These findings imply that, despite a solid digital-literacy foundation, meaningful AI integration will not materialize without concerted institutional effort. University leadership must therefore invest in robust infrastructure—ensuring stable connectivity and power supply—and subsidize access to essential AI platforms. Equally important is the provision of continuous, hands-on professional development that moves beyond introductory overviews to include advanced workshops on data analytics, pedagogical design, and student-centered AI applications. Embedding AI training into workload models, recognizing AI-driven innovation in appraisal systems, and establishing dedicated support structures—such as an AI-in-Education steering committee—can create the organizational momentum required to shift from sporadic use to systematic adoption. By aligning lecturers' above-moderate digital-literacy skills with targeted infrastructure upgrades, tailored training programs, and strategic leadership support, these specialized universities can accelerate AI diffusion. Such an approach holds promise not only for enhancing teaching efficiency and research productivity but also for enriching student learning experiences and streamlining administrative workflows, thereby fully realizing the transformative potential of artificial intelligence in higher education.

Acknowledgements

Conflict of Interest
The authors declared no conflict of interest.

References

Abdelaal, N., & Al Sawy, I. (2024). Perceptions, challenges, and prospects: University professors' use of artificial intelligence in education. *The Australian Journal of Applied Linguistics,* 7(1), 1309. https://doi.org/10.29140/ajal.v7n1.1309

Acheme, I.D., Nwankwo, W., Olayinka, A.S., Makinde, A.S., Nwankwo, C.P. (2023). Petroleum Drilling Monitoring and Optimization: Ranking the Rate of Penetration Using Machine Learning Algorithms. In: Hu, Z., Zhang, Q., He, M. (eds) Advances in Artificial Systems for Logistics Engineering III. ICAILE 2023. Lecture Notes on Data Engineering and Communications Technologies, vol 180. Springer, Cham. https://doi.org/10.1007/978-3-031-36115-9_15

Adetunji,C.O., Osikemekha, A.A., Olaniyan, T. O., Daniel, I.H., Nwankwo, W., Olayinka,A.S..(2022). Toward the design of an intelligent system for enhancing salt water shrimp production using fuzzy logic. In A. Abraham, S. Dash, J.J.P.C. Rodrigues, B. Acharya, S. K. Pani(Eds.), *Intelligent Data-Centric Systems: AI, Edge and IoT-based Smart Agriculture*(pp.533-541), Academic Press. https://doi.org/10.1016/B978-0-12-823694-9.00005-0.

Alenezi, A. (2024). Obstacles to the use of AI applications in blackboard for faculty members at Northern Border University, Saudi Arabia. *MIER Journal of Educational Studies Trends and Practices, 14*(2), 248–268. https://doi.org/10.52634/mier/2024/v14/i2/2581

Asika, M. O. & Asika, I. J. (2024). Assessing the extent of utilization and availability of artificial intelligence in teaching and assessment of students by lecturers in university. *Asian Journal of Assessment in Teaching and Learning, 14*(2), 87–95.

Bhaskaran, V. (2023). Survey Research: Definition, Examples and Methods. *QuestionPro*. https://www.questionpro.com/blog/survey-research/

Chinedu, P.U., Nwankwo, W., Masajuwa, F.U. and Imoisi, S. (2021). Cybercrime Detection and Prevention Efforts in the Last Decade: An Overview of the Possibilities of Machine Learning Models. *Review of International Geographical Education (RIGEO)*, 11(7), 956-974. Doi: 10.48047/rigeo.11.07.92

Davis, F. (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*, 319-340.

Edgar, T. W. & Manz, D. O. (2017). Descriptive Study. In: Research Methods for Cyber Security. *Elsevier EBooks*, 131–151. https://doi.org/10.1016/b978-0-12-805349-2.00005-4

Eze, A. O., & Onah, B. I. (2024). Analysis of educational artificial intelligence tools utilized by vocational education lecturers in teaching and learning in public universities in Enugu State, Nigeria. *E-Learning and Digital Media*.

Ezekiel, O. B. & Akinyemi, A. L. (2022). Utilisation of artificial intelligence in education: The perception of University of Ibadan lecturers. *Journal of Global Research in Education and Social Science*, *16*(5), 32–40. https://doi.org/10.56557/jogress/2022/v16i58053

Gandhi, A., & Gani, P. H. (2024). Would lecturers use AI-Based Software to write scientific articles? A quantitative approach in Indonesia. *Ingénierie des Systèmes d'Information*, 29(3), 941–950.

Goncalves, A. D. S., Junior, J. D. O., Parada, N. P., & Ulfa, S. (2024a). *AI Literacy Among Lecturers in University: A Case Study in a Private University in Timor-Leste.* Proceedings of the 32nd International Conference on Computers in Education., Asia-Pacific Society for Computers in Education (APSCE). https://library.apsce.net/index.php/ICCE/article/view/5043

Goncalves, A. D. S., Oliveira, J. D., Parada, N. P., & Ulfa, S. (2024a). *AI literacy among lecturers in university: A case study in a private university in Timor-Leste.* International Conference on Computers in Education. https://doi.org/10.58459/icce.2024.5043

Ibrahim, A. B. (2024). Assessing the Knowledge and Perception of Artificial Intelligence for Teaching and Research Among Lecturers in the Faculties of Arts in Nigeria. *Journal of Global Research in Education and Social Science*, *18*(2), 25–33. https://doi.org/10.56557/jogress/2024/v18i28671

Igulu, K. T., Nwankwo, W., Palimote, J., & Onuodu, F. (2024). Algorithms for robot navigation and positioning. In N. Singh, T. P. Singh, & B. Azzopardi (Eds.), Advances in autonomous navigation through intelligent technologies (AAP Advances in Artificial Intelligence and Robotics, 1st ed.). CRC Press.

Kamalov, F., Santandreu C. D., & Gurrib, I. (2023). New era of artificial intelligence in education: Towards a sustainable multifaceted revolution. *Sustainability, 15*(16), 12451. https://doi.org/10.3390/su151612451

Kasinidou, M., Kleanthoys, S., & Otterbacher, J. (2025). Cypriot teachers' digital skills and attitudes towards AI. *Discover Education*, *4*(1). https://doi.org/10.1007/s44217-024-00390-6

Kotamjani, S. S., Shirinova, S., & Fahimirad, M. (2023). *Lecturers' perceptions of using artificial intelligence in tertiary education in Uzbekistan*. Proceedings of the 7th International Conference on Future Networks and Distributed Systems, 570–578. https://doi.org/10.1145/3644713.3644797

Lionel, D. E., Uzoegbu, F. M., Nwaigwe, U. C., & Uchenna, O. B. (2024). Impact of Artificial Intelligence (AI) on Lecturers' Proficiency Levels in English Teaching and Library Practice in Nigerian Universities. *The International Journal of Research and Innovation in Social Science, 8*(3), 2217–2235.

Loan, T. T. T., & Thủy, N. T. H. (2024). Vietnamese university lecturers apply ai in teaching: A case study in Thu Dau Mot University. *European Journal of Theoretical and Applied Sciences*, *2*(6), 643–650. https://doi.org/10.59324/ejtas.2024.2(6).57

Mah, D.K., & Groß, N. (2023). Artificial intelligence in higher education: exploring faculty use, self-efficacy, distinct profiles, and professional development needs. *International Journal of Educational Technology in Higher Education, 21*, 58. https://doi.org/10.1186/s41239-024-00490-1

Marín, A.A.M., & Gómez Rivero, J.O. (2024). Implementation of artificial intelligence in the educational processes of university teachers. *Data Metadata*, *3*, 338. https://doi.org/10.56294/dm2024.338

Nwankwo, W.,Nwankwo., Adigwe Wilfred(2022). Leveraging on Artificial Intelligence to Accelerate Sustainable Bioeconomy. *IUP Journal of Knowledge Management*, 20(2),38-59.

Nwankwo W., Adetunji C.O., Olayinka A.S. (2022) IoT-Driven Bayesian Learning: A Case Study of Reducing Road Accidents of Commercial Vehicles on Highways. In: Pal S., De D., Buyya R. (eds) Artificial Intelligence-based Internet of Things Systems. Internet of Things (Technology, Communications and Computing). Springer, Cham. https://doi.org/10.1007/978-3-030-87059-1_15

Nwankwo, W., Orukwo, J., Umezuruike, C., Nwankwo, C.P., Chinedu, P.U., Obasi, C. (2024). IoT-Driven Analytics and Edge Intelligence in Autonomous Navigation Systems. In: Pal, S., Savaglio, C., Minerva, R., Delicato, F.C. (eds) IoT Edge Intelligence. Internet of Things. Springer, Cham. https://doi.org/10.1007/978-3-031-58388-9_11

Nwankwo, W., Adigwe,W., Umezuruike, C., Acheme, D.I., Nwankwo,C.P., Ojei, E., Oghorodi,D.(2023). Application of Support Vector Machine to Lassa Fever Diagnosis. In: Hu, Z., Zhang, Q., He, M. (eds) Advances in Artificial Systems for Logistics Engineering III. ICAILE 2023. Lecture Notes on Data Engineering and Communications Technologies, vol 180. Springer, Cham. https://doi.org/10.1007/978-3-031-36115-9_16

Olatunde-Aiyedun, T. G., & Hamma, H. (2023). Impact of artificial intelligence (AI) on lecturers' proficiency levels in MS PowerPoint, Canva and Gamma in Nigeria. *Horizon: Journal of Humanity and Artificial Intelligence*, *2*(8), 1–16.

Olayinka A.S., Adetunji C.O., Nwankwo W., Olugbemi O.T., Olayinka T.C. (2022) A Study on the Application of Bayesian Learning and Decision Trees IoT-Enabled System in Postharvest Storage. In: Pal S., De D., Buyya R. (eds) Artificial Intelligence-based Internet of Things Systems. Internet of Things (Technology, Communications and Computing). Springer, Cham. https://doi.org/10.1007/978-3-030-87059-1_18

Olayinka A.S., Nwankwo W., and Olayinka T.C. (2020). Model based Machine Learning Approach to Predict Thermoelectric Figure of Merit. *Archive of Science and Technology*, 1(1),55-57.

Onwodi, G., Nwankwo,W., Ojosu, O.A., Oyenusi,F., Awodele,O.,Ebem, D., Ukaoha, K.C.(2024). Development of Intelligent Anti-Cannibalistic Prototyping for Sustainable Catfish Farming. *2024 IEEE 5th International Conference on Electro-Computing Technologies for Humanity (NIGERCON)*, Ado Ekiti, Nigeria, 2024, pp. 1-5, doi: 10.1109/NIGERCON62786.2024.10927292.

Pangrazio, L., Godhe, A.-L., & Ledesma, A. G. L. (2020). What is digital literacy? A comparative review of publications across three language contexts. *E-Learning and Digital Media*, *17*(6), 442–459. https://doi.org/10.1177/2042753020946291

Preston, G. (2024). *Teaching with AI: How college professors are redefining the classroom*. OHIO Today. https://www.ohio.edu/news/2024/09/teaching-ai-how-college-professors-are-redefining-classroom

Salaria, N. (2012). Meaning of the term- descriptive survey research method. *International Journal of Economics and Business Management*. http://ijtbm.com/images/short_pdf/Apr_2012_NEERU%20SALARIA%202.pdf

Senior College and University Commission. (2021). *AI in Education: 39 Examples*. University of San Diego Online Degrees. https://onlinedegrees.sandiego.edu/artificial-intelligence-education/

Sheikh, H., Prins, C., & Schrijvers, E. (2023). Artificial intelligence: Definition and background. in: Mission AI. Research for Policy. *Springer, Cham*. https://doi.org/10.1007/978-3-031-21448-6_2

Ukhurebor, K.E., Nwankwo, Adetunji, C.O., Makinde, S.(2020). Artificial Intelligence and Internet of Things in Instrumentation and Control in Waste Biodegradation Plants: Recent Developments. In C.O. Adetunji, D.G. Panpatte & Y.K. Jhala (Eds.), *Microbial rejuvenation of polluted environment – Vol.3*, Springer Nature. Available at https://www.springer.com/gp/book/9789811574580#

Wang, S., Wang, F., Zhu, Z., Wang, J., Tran, T., & Du, Z. (2024). Artificial intelligence in education: A systematic literature review. *Expert Systems with Applications*, *15*, 124-167.