

INVESTIGATING EDUCATION TECHNOLOGY LECTURERS' AWARENESS LEVEL OF ARTIFICIAL INTELLIGENCE INNOVATIONS IN UNIVERSITIES IN SOUTH-SOUTH, NIGERIA

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Abstract: This study investigates awareness level of education technology lecturers on artificial intelligence (AI) innovations in universities in South-South, Nigeria. The research comprises three objectives and research questions, and one null hypothesis, employing a descriptive survey design. The population includes 1,990 education technology lecturers in South-South Nigeria, with a purposive stratified random sample of 199. The data collection utilized an instrument named Awareness of Education Technology Lecturers Questionnaire (AOETLQ), employing a four-point Likert scale expressed from Very high level to Very low level. The reliability index of the instrument was 0.72. Face and content validity were established by experts in measurement and evaluation of the University of Port Harcourt. Statistical analysis employed mean, standard deviation with hypotheses tested using ANOVA, at a significance level of 0.05. Findings indicate a Strong awareness of artificial intelligence innovations among education technology lecturers. Although senior lecturers were more positively influenced, the difference was not significant. This minimal influence indicated no substantial variation among the different ranks of lecturers. The study therefore recommends that senior lecturers should collaborate with their colleagues in using artificial intelligence innovations. The Universities should provide trainings, and workshops to support professional growth.

Keywords: Artificial Intelligence, AI, Innovations, Education Technology, Lecturers, South South, Nigeria.

1. INTRODUCTION

Innovation in the field of education refers to the introduction and application of new concepts, procedures, and technological advancements to enhance the educational process. This includes creative methods of instruction, curriculum development, and delivery of learning, creating an engaging and productive learning environment that goes beyond conventional instructional models. The phrase "technology awareness" describes a person's understanding and knowledge of a certain technology, including its features, functions, and potential uses. It might also provide an individual's perspective on the benefits and drawbacks of the technology. We may talk about the typical process people go through when they become aware of technology, even though there might not be steps or awareness levels that are widely accepted. The individual's background and interests, in addition to the level of sophistication of the technology, may all influence the awareness steps. People may not be fully aware of a new technology, like artificial intelligence (AI), when they first come into contact with it. But their awareness can change when they learn more about the topic, go to courses, or use AI apps.

In the broad field of computer science, artificial intelligence (AI) focuses on developing algorithms and computational models that mimic human cognitive processes. Artificial Intelligence (AI) is the development of intelligent beings that can reason, learn, adapt, and perform jobs that fall outside the traditional purview of human cognition. Experts, like Haroon et al. (2023), emphasize the simulation of human-like intelligence, which includes making decisions, solving problems, and identifying patterns without the need for explicit human programming. Artificial Intelligence has the potential to revolutionize teaching approaches and learning experiences in education, with worldwide ramifications.

This scholarly investigation explores the awareness levels of Education Technology instructors regarding AI breakthroughs, with a particular focus on the unique environment of South-South Nigerian colleges. These experts, who focus on technology integration, are essential in utilizing new developments in technology to improve teaching and learning. The purpose of this study is to ascertain the degree of awareness regarding educational technology among teachers in Nigeria's south-south universities. If they are aware of the advancements in artificial intelligence technology that are accessible globally for use in education.

Professionals with expertise in integrating technology into teaching are known as educational technology lecturers. They are essential in utilizing educational technology to improve instruction and student learning. These people are skilled in using a range of instruments, platforms, and online resources to design interactive and productive learning environments. To ensure that teachers and students alike benefit from the newest developments in educational technology, lecturers in education technology are at the forefront of adopting and implementing cutting-edge technologies like artificial intelligence.

This work builds on earlier research that examined the application of AI characteristics in educational settings in order to provide a thorough assessment of the competency levels of university instructors in South-South Nigeria. It also takes into account how artificial intelligence—chatbots—can be incorporated into education, as investigated in a relevant study. The setting of Artificial Intelligence innovation in Nigerian educational institutions is further influenced by the understanding and preparedness of polytechnic students to embrace AI in libraries (Afonughe, et al, 2021).

This study, which seeks to provide valuable insights into the level of AI knowledge among education technology instructors in South-South Nigerian universities, is both relevant and timely. Additionally, it fills in the vacuum in the literature, especially in the South-South region where there may be variations in the effects of AI on educational practices. Notably, recent research has examined how AI technology might be incorporated into Nigerian classrooms, highlighting the potential for these tools to encourage student creativity and entrepreneurship. Nonetheless, little research has been done expressly on the awareness levels of education technology lecturers, who are crucial in determining how higher education uses technology.

Research on the awareness levels of education technology lecturers, who play a critical role in determining the technological landscape of higher education, is scarce, despite the fact that recent studies have demonstrated AI's potential in Nigerian education (Thomas et al, 2021; Afonughe et al, 2021).

This study fills a vacuum in the literature by highlighting the diverse ways that artificial intelligence has affected educational practices, especially in the South-South region. In order to contribute to the continuing conversation about artificial intelligence's potential to influence education in the region, the research attempts to offer insightful information about the present state of AI awareness among education technology lecturers in South-South Nigerian universities.

Objectives of the study

- 1) To ascertain the AI innovation awareness level of education technology lecturers
- 2) To investigate the influence of gender on awareness level of education technology lecturers
- 3) To find out if university type (Federal, State, and Private) influences education technology lecturers' awareness level of Artificial intelligence innovations.

Research Questions

- 1) What is the awareness level of education technology lecturers on Artificial Intelligence Innovations?
- 2) How does gender influence education technology lectures' awareness of Artificial Intelligence innovation?
- 3) Does University type (Federal, State and Private) influence education technology lecturers' awareness of Artificial Intelligence Innovation?

Hypotheses

1. There is no significant difference in Education Technology Lecturers' awareness level of AI Innovations based on gender.
2. University type (Federal, State, and Private) does not influence education technology lecturers' awareness of Artificial Intelligence innovation.

2. REVIEW OF RELATED LITERATURE

Udoh et al. (2022) study investigates journalistic knowledge of artificial intelligence (AI) for news production among working journalists in Ebonyi State. The study, employing census sampling with 250 registered journalists, utilized a survey research approach. The data analysis was conducted using simple frequency and percentage tables. The study's foundation was rooted in the diffusion of innovation theory and the metamorphosis hypothesis. Notably, the research found that all journalists in Ebonyi State, registered under NUJ, were aware of AI usage in news production.

Fubara's (2020) study investigates the relationship between organizational innovation and social awareness among managerial employees in manufacturing companies in Rivers State. The study employs a cross-sectional research design with a small sample size of 97 participants. Census sampling and a structured questionnaire were utilized for data collection. The study employs descriptive statistics and Spearman's Rank Order Correlation Coefficients for analysis and finds a strong correlation between organizational innovation and social awareness. *Ikwuka et al. (2021)* study explores secondary school students' knowledge, acceptability, and implementation of ICT advancements. The research employs a robust survey research design, investigating three key aspects: awareness, acceptance, and adoption of ICT innovations among 7012 pupils in 18 public secondary schools in Anambra State's Aguata Local Government Area. A sample of 360 students, selected through a multi-stage sampling technique, participated in the study. The study lacks an in-depth analysis of the specific contextual factors influencing students' awareness, acceptance, and adoption of ICT innovations, which could enhance the study's applicability.

Adli et al. (2020) conducted research on the level of awareness among Malaysian construction practitioners regarding the use of Artificial Intelligence (AI) for risk analysis in construction projects. The study involved a survey of 184 practitioners, revealing a limited awareness of AI applications for risk analysis. Most respondents lacked knowledge about AI, didn't use it in their tasks, and hadn't received formal training. The findings suggest a gap in artificial intelligence awareness and adoption in the Malaysian construction industry. *Owolabi et al (2021)* study investigates the awareness and perception of artificial intelligence (AI) in the management of university libraries in Nigeria. Employing a survey design incorporating both qualitative and quantitative approaches, the study focuses on eighty academic librarians from purposively selected university libraries. The findings indicate that librarians are cognizant of artificial intelligence usage in libraries but express concerns about potential job loss, despite recognizing the technology's potential for enhancing user satisfaction.

Dergunova et al (2022) study investigates the awareness levels of artificial intelligence among university students, specifically those studying engineering. Conducted during the fall semester of 2021–2022, the research employs a qualitative research design with 98 students sampled purposefully. Data collection involved artificial intelligence awareness research questions, analyzed using content analysis. The study's focus on engineering students provides targeted insights into AI awareness within a specific academic group. *Aswathy et al (2021)* study explores the awareness about artificial intelligence among youth and its impact on employment, shedding light on the negative perceptions held by many young individuals regarding AI and its potential threat to careers.

Adebayo et al (2021) study investigates university students' awareness, access, and usage of artificial intelligence for learning in Kwara State, employing a descriptive survey method. The research focuses on the lack of awareness among students and emphasizes the critical role of digital technology access in exploring resources like AI. The study's alignment with this research theme of awareness makes it directly applicable to the work, emphasizing the importance of digital literacy among students. In the study conducted by *Wajid et al (2023)*, an insightful exploration into the awareness, perceptions, and opinions of pharmacy undergraduate students at King Saud University (KSU), Riyadh, Saudi Arabia, regarding Artificial Intelligence (AI) in healthcare was undertaken. The study employed robust methodologies, including online surveys and statistical analysis with SPSS, to gauge the perspectives of 157 senior pharmacy students. The study's emphasis on the need for early exposure to AI-related education in pharmacy curricula aligns with real-world applications, suggesting actionable strategies for educational institutions to prepare future professionals for AI integration.

3. METHODOLOGY

A descriptive survey research design method was used for this study. This study was conducted in South-South Geopolitical Zone of Nigeria, which spans approximately 84,587 square kilometres. The region includes Akwa Ibom, Bayelsa, Cross River, Delta, Edo, and Rivers States, the study's population consists of 1,990 education technology lecturers from the Department of Curriculum Studies and Education Technology across 31 universities in South-South Nigeria. The study used the Taro Yamen sampling method to compose a sample size of 199 from the population. Multi-stage sampling technique was used to draw out this sample size from the population in stages. The instrument called Artificial Intelligence Innovation Awareness of Education Technology Lecturers Questionnaire (AIIAQ) was validation by the experts and using Cronbach Alpha a reliability of 0.72 was achieved. The instrument was dispersed to respondents using e-copies and hard copies to obtain the required information from respondents. The collected data were analyzed using descriptive statistics, including mean scores and standard deviation. A decision threshold or criterion mean of 2.50 was set, indicating that any item statement with a mean score of 2.50 or higher was considered accepted. Mean and standard deviation was used to answer all questions while t-test was used to test the hypotheses.

4. RESULTS

Research question 1. What is the awareness level of education technology lecturers on Artificial Intelligence Innovations?

Mean and standard deviation of education technology lecturers' awareness level on Artificial Intelligence Innovations.

S/N	Items	N	Male 62 \bar{x}	Std. D	Female 63 \bar{x}	Std. D	Remark
1a	I am aware of the Copy AI Paraphrasing tool.	125	2.76	.81	2.72	.71	Accept
1b	I am aware of the Jasper AI Paraphrasing tool .	125	2.00	.00	2.10	.20	Reject
1c	I am aware of the QuillBot AI Paraphrasing tool.	125	3.50	.83	3.55	.73	Accept
1d	I am aware of the Scispace AI Paraphrasing tool.	125	2.50	.50	3.24	.50	Accept
2a	I am aware of the Research Assistant AI Literature Review tool	125	2.84	.85	2.67	.65	Accept
2b	I am aware of the Scite AI Literature Review tool.	125	2.26	.44	2.16	.54	Reject
2c	I am aware of the Elicit AI Literature Review tool.	125	2.79	.41	2.87	.41	Accept
2d	I am aware of the Research Rabbit AI Literature Review tool.	125	2.00	.00	1.68	.10	Reject
3a	I am aware of Visme's AI Image Creator.	125	2.77	.81	2.67	.71	Accept
3b	I am aware of DALL-E AI Image creator.	125	2.77	.84	2.98	.74	Accept
3c	I am aware of Craiyon AI Image creator.	125	3.25	.84	2.70	.84	Accept
3d	I am aware of Midjourney AI Image creator.	125	2.76	.43	2.92	.53	Accept
4a	I am aware of PyTorch Mathematical AI tool.	125	3.10	1.08	2.77	1.06	Accept
4b	I am aware of Symbolab Mathematical AI tool.	125	2.29	1.11	2.10	1.03	Reject
4c	I am aware of Desmos Mathematical AI tool .	125	3.24	.43	2.77	.53	Accept
4d	I am aware of My Script Calculator Mathematical AI tool.	125	2.47	.50	2.30	.50	Reject
5	I've attended workshops on various AI tools, including QuillBots, Spinbots, Grammarly, ChatGBT, and more.	125	2.50	.50	2.76	.60	Accept
6	I can differentiate among various AI tools, such as EduBirdie, Undetectable AI, Chugzi, Jarvis, QuillBot, Bing, Zotero and so on.	125	3.48	.72	3.50	.70	Accept
7	I can cite specific AI applications in Paraphrasing, Literature Review, Mathematics, and Image Creation tools.	125	2.77	.84	2.59	.74	Accept
8	I frequently read about artificial intelligence advancements and innovations	125	2.90	1.28	3.24	1.18	Accept

9	I recognize the ethical importance of integrating AI tools like Grammarly paraphrasing, QuillBot, Bing, Elicit.org, and others	125	3.14	1.17	2.70	1.27	Accept
10	I am aware of artificial intelligence communities and projects within my institution.	125	2.08	.70	2.92	.80	Reject
11	I've talked with colleagues about the impact of AI tools like Grammarly paraphrasing, QuillBot, and others on my profession.	125	2.31	.84	2.37	.74	Reject
12	I recognize the need to assess the effectiveness of AI tools like QuillBots, Spinbots, Grammarly, , and so on before adopting them.	125	2.42	.91	2.40	.81	Reject
13	I follow AI-focused blogs and online communities for these specific groups Paraphrasing Tools, Literature Review Tools, Mathematics Tools, and Image Creator Tools	125	2.76	.43	3.25	.53	Accept
14	I know how to use features in all AI tools for Paraphrasing, Literature Review, Mathematics, and Image Creation.	125	2.47	.50	2.36	.60	Reject
15	I can conveniently rate my overall knowledge of artificial intelligence concepts	125	1.68	.80	2.10	.70	Reject
16	I have extensively explored more than one AI-powered platforms and software	125	2.70	.79	2.89	.70	Accept
17	I can easily use AI tools I am conversant with on my laptop and phone effectively	125	2.92	.70	3.24	.60	Accept
	Average		2.67	0.70	2.73	0.69	

Grand Mean

2.68

Table 1 shows the awareness level of education technology lecturers in South-South Nigeria on Artificial intelligence innovations of each scaled item. The grand mean of 2.68 indicates that education technology lecturers have a high level of awareness, surpassing the criterion mean of 2.50. They favored item 6, which states: item 6 which states “I am aware of the QuillBot AI Paraphrasing tool. (3.45, SD=0.83, and 3.55, SD=0.73) which is followed by “I can differentiate among various AI tools, such as EduBirdie, Undetectable AI, Chugzi, Jarvis, QuillBot, Bing, Zotero, Paperpal, Score AI, Scispace, Elicit.org, Consensus AI, Open Read, Jenni AI, HIX.AI, Hypotenuse AI, etc”. Item 15 “I can conveniently rate my overall knowledge of artificial intelligence concepts” was least preferred with (1.68, SD=0.80, 2.10, SD=.70).

Research Question 2. How does gender influence education technology lectures' awareness of Artificial Intelligence innovation?

Gender	N	\bar{x}	Std. D	\bar{x} Diff.
Male	62	2.67	0.70	0.06
Female	63	2.73	0.69	
Total	125			

The table above revealed the male mean score was 2.67 with a standard deviation of 0.70 The female mean score was 2.73 with a standard deviation of 0.69 and a mean difference of 0.06. The mean difference of 0.06 shows that gender influence on education technology lectures' on Artificial intelligence innovation awareness is very minimal.

Research Question 3. Does University type (Federal, State and Private) influence education technology lecturers' awareness of Artificial Intelligence Innovation?

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Mean and standard deviation of University type (Federal, State and Private) influence on education technology lecturers' awareness of Artificial Intelligence Innovation

S/N	Items	N	FEDRRAL UNI NO. 111 \bar{x}	STATE UNI NO. 83 \bar{x}	PRIVATE UNI NO. 5 \bar{x}
1a	I am aware of the Copy AI Paraphrasing tool.	125	2.76, .50	2.45, .81	2.72, .54
1b	I am aware of the Jasper AI Paraphrasing tool .	125	2.00, .68	2.16, .00	2.10, .67
1c	I am aware of the QuillBot AI Paraphrasing tool.	125	3.50, .64	2.10, .83	3.55, .96
1d	I am aware of the Scispace AI Paraphrasing tool.	125	2.50, .70	2.10, .50	3.24, .78
2a	I am aware of the Research Assistant AI Literature Review tool	125	2.84, .72	2.15, .85	2.67, .92
2b	I am aware of the Scite AI Literature Review tool.	125	2.26, .74	2.15, .44	2.16, .50
2c	I am aware of the Elicit AI Literature Review tool.	125	2.79, .64	2.23, .41	2.87, .81
2d	I am aware of the Research Rabbit AI Literature Review tool.	125	2.00, .83	2.00, .00	1.68, .63
3a	I am aware of Visme's AI Image Creator.	125	2.77, .82	2.77, .81	2.67, .69
3b	I am aware of DALL-E AI Image creator.	125	2.77, .90	2.50, .84	2.98, .52
3c	I am aware of Craiyon AI Image creator.	125	3.25, .91	2.76, .84	2.70, .65
3d	I am aware of Midjourney AI Image creator.	125	2.76, .86	2.64, .43	2.92, .84
4a	I am aware of PyTorch Mathematical AI tool.	125	3.10, .85	3.00, 1.08	2.77, .68
4b	I am aware of Symbolab Mathematical AI tool.	125	2.29, .45	2.84, 1.11	2.10, .96
4c	I am aware of Desmos Mathematical AI tool .	125	3.24, .64	2.56, .43	2.77, .80
4d	I am aware of My Script Calculator Mathematical AI tool.	125	2.47, .101	3.10, .50	2.30, .62
5	I've attended workshops on various AI tools, including QuillBots, Spinbots, Grammarly, ChatGBT, and more.	125	2.50, .50	2.35, .50	2.76, .91
6	I can differentiate among various AI tools, such as EduBirdie, Undetectable AI, Chugzi, Jarvis, QuillBot, Bing, Zotero and so on.	125	3.48, .83	3.15, .72	3.50, .56
7	I can cite specific AI applications in Paraphrasing, Literature Review, Mathematics, and Image Creation tools.	125	2.77, .65	3.02, .84	2.59, .76
8	I frequently read about artificial intelligence advancements and innovations	125	2.90, .72	2.73, 1.28	3.24, .72
9	I recognize the ethical importance of integrating AI tools like Grammarly paraphrasing, QuillBot, Bing, Elicit.org, and others	125	3.14, .62	2.15, 1.17	2.70, .82
10	I am aware of artificial intelligence communities and projects within my institution.	125	2.08, .73	2.34, .70	2.92, .65
11	I've talked with colleagues about the impact of AI tools like Grammarly paraphrasing, QuillBot, and others on my profession.	125	2.31, .73	2.61, .84	2.37, .92
12	I recognize the need to assess the effectiveness of AI tools like QuillBots, Spinbots, Grammarly, , and so on before adopting them.	125	2.42, .57	1.98, .91	2.40, .84
13	I follow AI-focused blogs and online communities for these specific groups Paraphrasing Tools, Literature Review Tools, Mathematics Tools, and Image Creator Tools	125	2.76, .70	2.62, .43	3.25, .72
14	I know how to use features in all AI tools for Paraphrasing, Literature Review, Mathematics, and Image Creation.	125	2.47, .08	2.32, .50	2.36, .82
15	I can conveniently rate my overall knowledge of artificial intelligence concepts	125	1.68, .90	2.10, .80	2.10, .78
16	I have extensively explored more than one AI-powered platforms and software	125	2.70, .75	2.56, .79	2.89, .76
17	I can easily use AI tools I am conversant with on my laptop and phone effectively	125	2.92, .72	2.12, .70	3.24, .81
	Average		2.67, .74	2.46, .62	2.53, .53

From the result above federal university has a mean score of 2.67, and SD of 0.74, state university has 2.46 and an SD of 0.62 while Private university has 2.53 and SD of 0.53. this indicate that the federal university lecturers are more aware of Artificial intelligent innovation than the state and private university lectures. From the mean variation and SD, it is also obvious that the awareness varies more among the federal university lecturers also with the highest SD of 0.74.

Hypothesis 1: There is no significant difference in Education Technology Lecturers' awareness level of AI Innovations based on gender.

Table 4: t-test on education technology lectures' awareness of Artificial Intelligence innovation

Gender	N	\bar{x}	SD	df	t	Sig	Remark
Male	62	2.69	0.69	123	0.590	0.651	Accepted
Female	63	2.73	0.70				

Table 4 shows df 123, t=0.590, p=0.651, this implies that the hypothesis which states that there is no significant difference in Education Technology Lecturers' awareness level of AI Innovations based on gender was accepted. It is evident from the table that both male and female lecturers have the same disposition towards the awareness of artificial innovation awareness in South-South, Nigerian Universities.

Hypothesis 2: University type (Federal, State, and Private) does not influence education technology lecturers' awareness of Artificial Intelligence innovation.

Table 5: One way ANOVA of influence of type of University on Lecturers' awareness of Artificial Intelligence Innovations

	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Between Groups	.082	2	.041	1.86	0.158	Statistically not significant
Within Groups	31.070	122	.255			
Total	31.152	124				

Since the p-value (0.158) is greater than the significance level ($\alpha=0.05$ \alpha = 0.05 $\alpha=0.05$), we fail to reject the null hypothesis. Conclusion is that there is no statistically significant evidence to suggest that university type (Federal, State, and Private) influences education technology lecturers' awareness of AI innovation.

5. DISCUSSION

The Awareness of Education Technology Lecturers on Artificial Intelligence Innovations

The outcomes depicted high level of artificial intelligence innovations awareness among education technology lecturers in the South-South Nigeria Universities. This finding is consistent with the studies by Udoh et al. (2022), Owolabi et al. (2021), Dergunova et al. (2022), Aswathy et al. (2021), and Wajid et al. (2023), all of which reported high awareness of artificial intelligence innovations. These studies comprehensively evaluate various aspects of artificial intelligence awareness, including its utility in healthcare, potential benefits, and the necessity for further education in the field.

This multifaceted approach enriches the depth of the research findings which was that there was a high level of awareness of artificial intelligence among pharmacy students at King Saud University. The result agrees with the findings of the current study. While (Fubara, 2020; Ikwuka et al., 2021; Adli et al., 2020; and Adebayo et al., 2021) in their various studies disagree with the finding indicating that artificial intelligence innovations are not popular in among professionals in some sectors.

Gender and Lectures' Adoption Category of Artificial Intelligence Innovation

In the studies carried out by Ananya, and Sraboni's, 2016; Suhong et al. (2018) gender was identified as a key factor in describing human behavior towards technological uptake. It was further discovered that gender influences the desire to accept new technology in a small number of situations, and there are other situations in which gender differences cannot be distinguished. Yi-Shun et al. (2014), disagrees with this in their finding, they discovered that gender was not a factor in using AI.

6. CONCLUSION

This study analyzed the awareness of artificial intelligence advancements among 125 education technology lecturers in South-South Nigerian universities. It found that there is a high awareness of AI innovations especially among the senior lectures. The study suggests that promoting expert forums and promoting knowledge dissemination can sustain the growth of educational technology instructors. Future projects should build on these findings to improve AI integration in South-South Nigerian universities.

7. RECOMMENDATIONS

Based on the findings, the following recommendations were made:

- 1) Universities should implement standardized artificial intelligence awareness programs to ensure equal exposure and knowledge dissemination.
- 2) Workshops across various university settings should be organized to foster a consistent understanding, awareness, and positive attitude toward Artificial Intelligence innovations among lecturers, thereby promoting a standardized approach to education.
- 3) It is recommended that gender equity initiatives in education technology be implemented to ensure equal opportunities, resources, and support for both male and female educators in utilizing AI innovations.

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