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Assessing Secondary School Teachers' Awareness and Readiness to Teach Artificial Intelligence (AI) Concepts in Lagos State, Nigeria

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Abstract

This study examined the level of secondary school teachers' awareness and readiness to teach Artificial Intelligence (AI) concepts in Lagos State, Nigeria. A quantitative descriptive survey design was adopted, involving 203 teachers selected through stratified and purposive sampling techniques. Data were collected using a structured questionnaire and analysed using descriptive statistics and Pearson Product-Moment Correlation. Findings revealed that teachers have a moderate level of awareness of AI concepts (grand mean = 3.21), indicating a general understanding of AI and its relevance to education, though exposure to formal training is limited. Similarly, teachers demonstrated a moderate level of readiness to teach AI (grand mean = 2.78). While many teachers showed strong motivation to learn and some level of confidence, their readiness is constrained by inadequate access to resources, limited institutional support, and low integration of AI into classroom practice. The study further revealed a significant moderate positive relationship between teachers' awareness and readiness ($r = 0.54, p < 0.01$), suggesting that increased awareness enhances teachers' preparedness to teach AI concepts effectively. The study concludes that improving teachers' awareness through targeted training and support systems is essential for enhancing their readiness and ensuring the successful integration of AI into secondary school education.

Keywords: Artificial Intelligence; Teachers' Awareness; Readiness; Professional development; Curriculum integration

INTRODUCTION

Artificial Intelligence (AI) is increasingly reshaping contemporary education systems by enabling more personalised learning experiences and improving institutional efficiency. Through technologies such as adaptive learning systems and intelligent tutoring platforms, AI can analyse learners' data and tailor instructional content to meet individual needs, thereby enhancing engagement and academic outcomes (Holmes *et al.*, 2019). In addition, AI-powered tools provide real-time feedback and customised learning pathways, supporting a more responsive and student-centred approach to teaching and learning (Luckin *et al.*, 2016).

Beyond instructional delivery, AI contributes to administrative efficiency by automating routine tasks and enabling data-driven decision-making within educational institutions. However, despite these advantages, the integration of AI into education raises important ethical and pedagogical concerns. Issues such as data privacy, algorithmic bias, and the potential overreliance on automated systems have generated ongoing debates regarding the implications of AI for teaching and learning (Selwyn, 2020). These concerns underscore the need for educators to play an active role in guiding the responsible use of AI while promoting critical thinking and digital literacy among students.

The successful integration of AI into secondary education depends largely on teachers' preparedness. Teachers are central to curriculum implementation, and their ability to understand and teach AI concepts is influenced by several factors, including their technological pedagogical content knowledge (TPACK), confidence levels, and access to instructional resources. Research indicates that although some teachers possess adequate technological and subject knowledge, many lack the pedagogical competence required to effectively teach AI-related concepts (Doukakis *et al.*, 2021). This gap poses a significant challenge to the effective implementation of AI education in schools.

Furthermore, the limited inclusion of AI in teacher education programmes, coupled with the scarcity of continuous professional development opportunities, contributes to low levels of preparedness. Evidence from African contexts, such as Kenya, shows that AI is not yet fully integrated into existing school curricula, thereby limiting teachers' exposure and capacity to teach such content (Wambugu *et al.*, 2024). This highlights the urgent need for structured training programmes that equip teachers with both conceptual understanding and practical teaching strategies for AI.

Teachers' readiness to teach AI is a multidimensional construct encompassing cognitive, pedagogical, technical, and attitudinal components, as well as access to relevant resources (Ayanwale *et al.*, 2022; Ololube, 2013). Cognitive readiness involves teachers' understanding of fundamental AI concepts, including machine learning, data systems, and ethical considerations. However, studies in Nigeria indicate that many teachers have limited knowledge of these concepts due to outdated curricula and insufficient exposure to emerging technologies (Adesina and Omoregie, 2015; Ogunyemi *et al.*, 2020; Eze *et al.*, 2021). Afolabi and Yusuf (2022) further noted that infrastructural deficits and inadequate teacher preparation programmes compound these challenges, leaving many educators ill-equipped to integrate AI into their teaching.

Pedagogical readiness refers to the ability to effectively deliver AI content using learner-centred approaches such as inquiry-based and project-based learning. Despite this, classroom practices in many Nigerian secondary schools remain predominantly teacher-centred, with heavy reliance on traditional teaching methods and textbooks (Ugwuanyi *et al.*, 2020; Ayanwale *et al.*, 2022). In contrast, countries that have introduced coding and AI-related initiatives at the school level have reported improvements in teachers' pedagogical competence (Mwangi *et al.*, 2019).

Technical readiness relates to teachers' proficiency in using digital tools and AI technologies for instructional purposes. In many developing contexts, infrastructural challenges—including unreliable internet access and limited availability of digital devices—significantly hinder teachers' ability to integrate AI into classroom practice (Omoregie *et al.*, 2021; Zongo *et al.*, 2022; Kasozi *et al.*, 2021). Chen *et al.* (2020) observed that countries with robust digital infrastructure and clear policy frameworks have made more significant progress in integrating AI into education, highlighting the importance of systemic investment.

Attitudinal readiness, on the other hand, reflects teachers' motivation, confidence, and willingness to adopt AI in teaching. While some educators demonstrate enthusiasm toward AI integration, others express anxiety due to perceived complexity and concerns about professional relevance (Asare *et al.*, 2021; Ramdhany *et al.*, 2020). Celik (2023) found that teachers' attitudes toward AI are significantly influenced by their prior experience with technology and the level of institutional support available. These attitudinal differences play a crucial role in determining the extent to which AI is embraced in educational settings.

Assessing teachers' readiness requires a combination of quantitative and qualitative approaches. Instruments such as the Teacher AI Readiness Index (TARI) provide structured measures of cognitive, pedagogical, and technical competencies, while qualitative methods—such as interviews and focus groups—offer deeper insights into teachers' perceptions and contextual challenges (Mwangi *et al.*, 2019; Ogunyemi *et al.*, 2020). The integration of these approaches ensures a more comprehensive understanding of both perceived and actual readiness.

Closely linked to readiness is teachers' awareness of AI. Awareness refers to the extent to which teachers are familiar with AI concepts, applications, and their implications for education. It serves as a foundational element of readiness, as teachers who possess a clear understanding of AI are more likely to integrate it into their instructional practices (Selwyn, 2020). Teachers' awareness is often shaped by prior exposure, access to professional development opportunities, and the level of institutional support available within the educational system. Kim *et al.* (2022) emphasised that awareness programmes should be designed to address both technical knowledge and ethical considerations to prepare teachers for responsible AI integration.

LITERATURE REVIEW

Artificial Intelligence Concepts in Secondary Education

Artificial Intelligence (AI) concepts in secondary education refer to the foundational knowledge, practical competencies, and ethical considerations required for integrating AI literacy into school curricula. These concepts define the scope and depth of AI content suitable for secondary school learners, ensuring a balance between technical complexity and pedagogical accessibility (Ndlovu *et al.*, 2020).

AI education at the secondary level can be broadly organised into four interconnected domains: fundamental principles, real-world applications, ethical considerations, and experiential learning skills. Foundational principles include core ideas such as algorithms, data processing, machine learning, and neural networks. At this level, these concepts must be simplified and contextualised to make them accessible to learners. For instance, algorithms can be introduced using familiar, everyday processes such as cooking instructions or traffic control systems, thereby enhancing comprehension and engagement (Ogunyemi *et al.*, 2020).

Beyond foundational knowledge, exposing students to practical applications of AI—such as chatbots, recommendation systems, and automated decision-making—helps to bridge theory and practice. Equally important are ethical considerations, including issues of data privacy, bias, and responsible AI use, which are essential for developing informed and critical users of technology. Hands-on activities, such as basic coding and problem-solving tasks, further support active learning and skill development, making AI education more meaningful and relevant (Touretzky *et al.*, 2019).

Teachers' Readiness to Teach Artificial Intelligence

Teachers' readiness to teach Artificial Intelligence (AI) is a critical factor in the successful integration of AI into secondary education. It refers to the extent to which teachers are prepared to effectively deliver AI-related content in the classroom. This readiness is a multidimensional construct encompassing cognitive, pedagogical, technical, and attitudinal components, as well as access to essential instructional resources (Ayanwale *et al.*, 2022; Ololube, 2013).

Cognitive readiness involves teachers' understanding of AI concepts and their implications for teaching and learning. Pedagogical readiness relates to the ability to apply appropriate teaching strategies, while technical readiness focuses on the capacity to use digital tools and AI technologies effectively. Attitudinal readiness, on the other hand, reflects teachers' beliefs, motivation, and willingness to engage with AI in educational settings. In contexts characterised by resource constraints and systemic challenges, such as Nigeria, understanding these dimensions is crucial for designing effective interventions that support teachers' professional development (Afolabi and Yusuf, 2022).

Attitudinal Readiness

Attitudinal readiness plays a significant role in shaping teachers' engagement with AI. It encompasses their confidence, motivation, and openness to adopting new technologies in their teaching practice. While some teachers perceive AI as an opportunity to enhance teaching and learning, others experience uncertainty or anxiety due to its perceived complexity and potential impact on their professional roles (Eze *et al.*, 2021).

Empirical studies highlight varying attitudes among teachers across different contexts. For example, a study conducted in Ghana found that while over half of the teachers expressed enthusiasm about integrating AI into education, a substantial proportion remained hesitant due to inadequate training and preparedness (Asare *et al.*, 2021). Similarly, research in Nigeria indicates that some teachers feel overwhelmed by the rapid pace of technological change, which affects their confidence in adopting AI-related practices (Ayanwale *et al.*, 2022).

Addressing these concerns requires targeted interventions that build teachers' self-efficacy and confidence. Mentorship programmes, peer collaboration, and continuous professional development have been shown to improve teachers' attitudes

toward AI integration. For instance, a peer-support initiative in South Africa significantly enhanced teachers' confidence and willingness to engage with AI tools (Ramdhany *et al.*, 2020). Furthermore, teachers are more likely to embrace AI when they recognise its relevance to students' future career opportunities (Ndlovu *et al.*, 2020).

Measurement of Teachers' Readiness

Assessing teachers' readiness to teach AI requires a comprehensive approach that combines both quantitative and qualitative methods. Quantitative tools, such as structured questionnaires using Likert scales, are commonly employed to measure teachers' self-reported knowledge, confidence, and skills (Ugwuanyi *et al.*, 2020). One such instrument is the Teacher AI Readiness Index (TARI), which evaluates cognitive, pedagogical, and technical competencies through scenario-based assessments (Mwangi *et al.*, 2019).

However, reliance on self-reported data may lead to overestimation of competence. Studies have shown discrepancies between teachers' perceived readiness and their actual classroom practices, highlighting the need for complementary assessment methods (Ogunyemi *et al.*, 2020). Qualitative approaches, including interviews and focus group discussions, provide deeper insights into teachers' experiences, challenges, and perceptions. For instance, qualitative research in Ghana revealed concerns related to job security and ethical dilemmas associated with AI adoption (Asare *et al.*, 2021).

The integration of multiple data sources enhances the validity of findings and provides a more holistic understanding of teachers' readiness, particularly in diverse educational contexts where local factors significantly influence outcomes (Kim *et al.*, 2022).

Institutional Support and Teachers' Readiness

Institutional support is a key determinant of teachers' readiness to integrate AI into secondary education. It encompasses the administrative, technical, financial, and pedagogical support provided by educational institutions to facilitate the adoption of new technologies. Without adequate institutional support, even highly motivated teachers may struggle to implement AI-related content effectively.

As AI continues to gain global relevance, its inclusion in school curricula is becoming increasingly important (Holmes *et al.*, 2022). However, the success of such initiatives depends largely on the extent to which teachers are supported. Institutional support creates an enabling environment that fosters innovation and encourages teachers to experiment with new teaching approaches. Research indicates that when schools provide structured support systems, teachers are more likely to adopt and sustain the use of emerging technologies (Wang *et al.*, 2022).

Key components of institutional support include access to resources, leadership support, policy frameworks, and opportunities for professional development. These elements collectively contribute to enhancing teachers' confidence, competence, and overall readiness to teach AI (Chen *et al.*, 2020).

Professional Development and Training

Continuous professional development is central to building teachers' capacity to teach AI effectively. Given the complexity and evolving nature of AI, many teachers—particularly in developing countries—lack formal training in this area (Sands *et al.*, 2020). As a result, targeted training programmes are essential to equip teachers with both theoretical knowledge and practical teaching skills.

Effective professional development initiatives should go beyond basic awareness and focus on hands-on experiences, collaborative learning, and context-specific applications. Evidence from Taiwan shows that structured training programmes significantly improve teachers' confidence and competence in integrating AI into classroom instruction (Hsu *et al.*, 2021). Such programmes should also incorporate pedagogical strategies tailored to AI education, ensuring that teachers can translate their knowledge into effective teaching practices (Sperling *et al.*, 2024).

Darling-Hammond *et al.* (2017) emphasised that effective professional development should be sustained, collaborative, and directly connected to teachers' classroom contexts. Desimone (2009) further argued that professional development programmes must include active learning opportunities, coherence with curriculum goals, and sufficient duration to produce meaningful changes in teaching practice. These principles are particularly relevant for AI education, where teachers require ongoing support to navigate rapidly evolving technologies.

Theoretical Framework

Technological Pedagogical Content Knowledge (TPACK) Framework

This study is anchored on the Technological Pedagogical Content Knowledge (TPACK) framework, developed by Mishra and Koehler (2006). The TPACK framework provides a comprehensive model for understanding the knowledge required for effective technology integration in teaching.

The framework emphasises the interaction among three primary forms of knowledge: Technological Knowledge (TK), which involves understanding digital tools and technologies; Pedagogical Knowledge (PK), which refers to teaching methods and instructional strategies; and Content Knowledge (CK), which represents mastery of subject matter. More importantly, TPACK highlights the intersections of these domains—Technological Pedagogical Knowledge (TPK), Technological Content Knowledge (TCK), and Pedagogical Content Knowledge (PCK)—culminating in the integrated TPACK construct.

In the context of AI education, the TPACK framework is particularly relevant as it underscores the need for teachers to combine technological expertise with appropriate pedagogical approaches and subject knowledge. It provides a useful lens for examining teachers' readiness to teach AI concepts and guides the development of training programmes aimed at enhancing their instructional effectiveness.

METHODOLOGY

This section outlines the procedures and methods adopted in conducting the study. It describes the research design, population and sample, instruments for data collection, validity and reliability of the instrument, data collection procedures, methods of data analysis, and ethical considerations. These procedures were carefully selected to ensure the collection of reliable and valid data for assessing secondary school teachers' awareness and readiness to teach Artificial Intelligence (AI) concepts in Lagos State.

Research Design

This study adopted a quantitative research approach using a descriptive survey design to investigate teachers' readiness for teaching Artificial Intelligence (AI) concepts. The descriptive survey method was considered appropriate because it allows for the systematic collection of data from a large population within a relatively short period. It also facilitates the use of statistical tools to describe and analyse patterns, relationships, and trends among variables. In this study, the design enabled the researcher to examine the relationship between teachers' readiness and the effective implementation of AI teaching. The use of quantitative methods ensured objectivity, precision, and generalisability of findings across secondary schools in Lagos State Education District V.

Participants

The participants for this study comprised secondary school teachers in Lagos State Education District V who are actively involved in teaching and integrating AI-related concepts. The study employed a combination of stratified random sampling and purposive sampling techniques to ensure adequate representation. Stratification ensured that teachers from different schools and varying levels of teaching experience were proportionately included, while purposive sampling targeted teachers relevant to the study objectives. A total of 203 teachers were selected as the sample size for the study. This sample was considered sufficient to provide reliable data and meaningful insights into teachers' awareness, and readiness in teaching AI concepts within the district.

Instrument for Data Collection

The primary instrument used for data collection was a structured questionnaire titled *Secondary School Teachers' Readiness for Teaching AI Concepts Questionnaire* (SSTRACQ). The instrument consisted of 20 items designed to address four key research questions. Responses were measured using a four-point Likert scale: Strongly Agree, Agree, Disagree, and Strongly Disagree. The questionnaire was divided into three sections: Section A captured demographic information; Section B assessed teachers' awareness of AI concepts; Section C measured teachers' readiness; The structured nature of the instrument ensured uniformity in responses and ease of quantitative analysis.

Validity and Reliability

The validity of the instrument was established through expert evaluation and pilot testing. A specialist in computer

education and AI pedagogy reviewed the questionnaire to ensure content, face, and construct validity, confirming that the items adequately measured the intended variables. For reliability, a pilot study was conducted with 25 secondary school teachers who were not part of the main sample. The internal consistency of the instrument was determined using Cronbach’s Alpha coefficient. A reliability coefficient of 0.70 or higher was considered acceptable for this study. These procedures ensured that the instrument was both accurate and consistent in measuring teachers’ readiness and related variables.

Data Analysis

Data collected from the respondents were analysed using both descriptive and inferential statistical methods. Descriptive statistics, including frequency counts and percentages, were used to summarise demographic information such as gender, teaching experience, and qualifications. Mean and standard deviation were employed to analyse teachers’ awareness and readiness. The results were presented in tables to enhance clarity and understanding. Inferential statistics, specifically Pearson Product-Moment Correlation, were used to examine the relationship between teachers’ awareness and their readiness to teach AI concepts. This approach enabled the researcher to draw meaningful conclusions from the data.

Ethical Consideration

Ethical standards were strictly observed throughout the study to ensure the protection of participants. Participation was voluntary, and informed consent was obtained from all respondents before data collection. Participants were assured of confidentiality and anonymity, as no personal identifiers were included in the questionnaire. The data collected were used solely for academic purposes and were securely handled to prevent unauthorised access. Respondents were also given the right to withdraw from the study at any stage without any

Table 1: Distribution of respondents by gender.

Gender	N	%
Female	107	52.7
Male	96	47.3
Total	203	100

consequences. These ethical measures helped to build trust and encouraged honest responses, thereby enhancing the credibility and integrity of the research findings.

Data Collection Procedure

The data collection process was conducted systematically to ensure accuracy and completeness. The questionnaire was administered electronically using Google Forms, allowing for easy distribution to selected secondary school teachers across the district. Respondents were given clear instructions on how to complete the questionnaire. Follow-up reminders were sent to encourage participation and improve the response rate. Upon completion, the responses were carefully monitored and screened to ensure completeness and consistency. Any incomplete or inconsistent responses were excluded from the final analysis. This structured procedure ensured the collection of reliable and high-quality data for the study.

RESULTS

Demographic Data

The survey sample of 203 respondents (Table 1) exhibits a slight female majority, with 107 women comprising 52.7% and 96 men accounting for 47.3% of the total sample. This gender distribution indicates a relatively balanced representation of male and female teachers in the study, though with a marginally higher proportion of female participants. The standard error of proportion for the female category was calculated as $SE = \sqrt{(0.527 \times 0.473)/203} = 0.035$, yielding a 95% confidence interval of 45.8% to 59.6%

Table2: The level of awareness of secondary school teachers regarding artificial intelligence (AI) concepts.

	SA	A	D	SD	MEAN	STD.DEV
I have a basic understanding of AI concepts.	70 34.5%	117 57.6%	11 5.4%	5 2.5%	3.24	0.66
I am aware of the different applications of AI in education.	59 29.1%	126 62.1%	12 5.9%	6 3.0%	3.17	0.66
I keep myself updated with AI advancements.	48 23.6%	120 59.1%	28 13.8%	7 3.4%	3.03	0.72
I have attended a seminar or workshop on AI.	44 21.7%	86 42.4%	60 29.6%	13 6.4%	2.79	0.85
AI concepts are relevant to secondary school education.	73 36%	112 55.2%	14 6.9%	4 2.0%	3.25	0.67
I can differentiate between AI and traditional computing.	62 30.5%	112 55.2%	24 11.8%	5 2.5%	3.14	0.71
AI literacy should be part of teacher training programs.	105 51.7%	88 43.3%	6 3.0%	4 2.0%	3.45	0.65
I understand how AI is used in student assessment and feedback.	32 15.8%	124 61.1%	42 20.7%	5 2.5%	3.24	0.56
AI can enhance personalised learning in the classroom.	77 37.9%	116 57.1%	7 3.4%	3 1.5%	3.32	0.61
I believe AI will significantly impact future teaching methods.	100 49.3%	92 45.3%	8 3.9%	3 1.5%	3.42	0.64
Grand Mean : 3.21						

for the female proportion. This suggests that the true proportion of female teachers in the population is likely between these bounds, indicating that the sample is representative of the gender distribution within the teaching workforce in Lagos State Education District V.

Research Question One

What is the level of awareness of secondary school teachers regarding artificial intelligence (AI) concepts?

The results in Table 2 indicate that secondary school teachers have a moderate level of awareness of artificial intelligence (AI) concepts, as reflected by the grand mean of 3.21 on a 4-point scale, with a standard deviation of approximately 0.67 across all items. This grand mean corresponds to 80.25% of the maximum possible score, suggesting that teachers, on average, agree with statements indicating awareness of AI concepts.

Teachers demonstrated high awareness regarding the importance of integrating AI into teacher training ($M = 3.45$, $SD = 0.65$), its impact on future teaching methods ($M = 3.42$, $SD = 0.64$), and its role in enhancing personalised learning ($M = 3.32$, $SD = 0.61$). Additionally, they showed a fair understanding of AI's relevance to secondary education ($M = 3.25$, $SD = 0.67$), student assessment ($M = 3.24$, $SD = 0.56$), and basic concepts ($M = 3.24$, $SD = 0.66$). The relatively low standard deviations across most items (ranging from 0.56 to 0.72) indicate that teachers' responses were fairly consistent, with limited variability in their levels of awareness.

However, lower awareness was observed in areas such as participation in AI-related workshops ($M = 2.79$, $SD = 0.85$) and staying updated with AI advancements ($M = 3.03$, $SD = 0.72$). Notably, the item on workshop attendance exhibited the highest standard deviation ($SD = 0.85$), suggesting greater variability in teachers' exposure to formal AI training. This suggests that while teachers recognize AI's significance, their exposure to formal training and continuous learning remains

limited. The mean score for formal training participation ($M = 2.79$) was substantially below the grand mean, representing a gap of 0.42 points, which may indicate systemic deficiencies in professional development opportunities.

Research Question Two

What is the level of secondary school teachers' readiness to teach AI concepts?

The results in Table 3 show that secondary school teachers have a moderate level of readiness to teach artificial intelligence (AI) concepts, as indicated by the grand mean of 2.78 on a 4-point scale, which corresponds to 69.5% of the maximum possible score. The overall standard deviation of approximately 0.72 across all items suggests moderate variability in teachers' self-reported readiness levels.

Teachers demonstrated strong motivation to learn more about AI ($M = 3.37$, $SD = 0.67$), with 93.6% of respondents either agreeing or strongly agreeing with this statement. This indicates a positive disposition toward AI integration. Additionally, teachers showed initiative in seeking professional development ($M = 2.99$, $SD = 0.63$) and moderate confidence in teaching AI concepts ($M = 2.90$, $SD = 0.72$). Approximately 75.3% of teachers reported feeling confident or somewhat confident in their ability to teach AI concepts.

However, most indicators fall below the benchmark (grand mean), revealing significant constraints. The lowest scores were recorded for government provision of AI training opportunities ($M = 2.24$, $SD = 0.89$), access to necessary resources for teaching AI ($M = 2.59$, $SD = 0.71$), and integration of AI topics into teaching practice ($M = 2.61$, $SD = 0.73$). The item on government support exhibited the highest standard deviation ($SD = 0.89$), indicating considerable disagreement among teachers regarding the availability of formal training opportunities. Government support for AI training is particularly weak, with only 35% of

Table3: Level of awareness of secondary school teachers' readiness to teach AI concepts.

	SA	A	D	SD	MEAN	STD.DEV
I feel confident in my ability to teach AI concepts.	36 17.7%	117 57.6%	43 21.2%	7 3.4%	2.90	0.72
I have access to necessary resources for teaching AI.	15 7.4%	102 50.2%	74 36.5%	12 5.9%	2.59	0.71
I integrate AI topics into my teaching.	18 8.9%	100 49.3%	73 36.0%	12 5.9%	2.61	0.73
My school encourages AI education among teachers.	21 10.3%	113 55.7%	52 25.6%	17 8.4%	2.68	0.77
I actively seek AI-related professional development opportunities.	33 16.3%	140 69.0%	24 11.8%	6 3.0%	2.99	0.63
I use AI-based tools in my teaching.	25 12.3%	119 58.6%	49 24.1%	10 4.9%	2.78	0.72
I feel prepared to answer students' AI-related questions.	25 12.3%	131 64.5%	43 21.2%	4 2.0%	2.87	0.63
I am motivated to learn more about AI.	92 45.3%	98 48.3%	9 4.4%	4 2.0%	3.37	0.67
The government provides enough AI training opportunities for teachers.	20 9.9%	51 25.1%	89 43.8%	43 21.2%	2.24	0.89
I collaborate with other teachers to improve AI instruction.	21 10.3%	126 62.1%	44 21.7%	12 5.9%	2.77	0.71
Grand Mean :					2.78	

teachers agreeing or strongly agreeing that adequate opportunities exist.

The mean difference between the highest-rated item (motivation to learn, $M = 3.37$) and the lowest-rated item (government support, $M = 2.24$) is 1.13 points on a 4-point scale, representing a substantial gap that highlights systemic deficiencies in institutional and governmental support structures. The relatively low scores on resource availability and integration of AI topics into teaching (both below 2.70) indicate that teachers' enthusiasm for AI integration is not matched by practical support mechanisms.

Overall, while teachers are willing and interested, their practical readiness is constrained by insufficient training, resources, and systemic support. The readiness grand mean of 2.78 (69.5%) falls significantly below the awareness grand mean of 3.21 (80.25%), suggesting that awareness outpaces practical readiness by approximately 10.75 percentage points. This gap may indicate that teachers recognise the importance of AI but lack the institutional support necessary to translate awareness into classroom practice.

Hypothesis One

There is no significant relationship between teachers' awareness of AI concepts and their readiness to teach AI.

The result in Table 4 shows a moderate positive and significant relationship between teachers' awareness of AI concepts and their readiness to teach AI ($r = 0.54$, $p < 0.01$), indicating that higher awareness of AI concepts is associated with greater readiness to teach AI. The correlation coefficient of 0.54 falls within the moderate range (0.30–0.70), suggesting that approximately 29.2% of the variance in teachers' readiness ($r^2 = 0.29$) can be explained by their level of awareness of AI concepts.

The statistical significance at the 0.01 level ($p = 0.00$) indicates that the probability of observing this relationship by chance is less than 1%, providing strong evidence against the null hypothesis. Therefore, the null hypothesis stating that there is no significant relationship between teachers' awareness of AI concepts and their readiness to teach AI is rejected. This finding has practical implications, as it suggests that interventions designed to enhance teachers' awareness of AI concepts could potentially yield measurable improvements in their readiness to integrate AI into classroom instruction.

The moderate strength of the correlation also indicates that while awareness is an important predictor of readiness, other factors—such as institutional support, access to resources, and prior training—also play significant roles in determining teachers' overall preparedness. The coefficient of determination ($r^2 = 0.29$) suggests that nearly 71% of the variance in readiness is attributable to other variables, highlighting the multidimensional nature of teacher readiness and the need for comprehensive support systems beyond awareness-building initiatives.

FINDINGS

The first major finding of this study reveals that secondary school teachers demonstrate a *moderate level of awareness*

Table 4: Pearson Correlation showing the relationship between teachers' awareness of AI concepts and their readiness to teach AI.

		Awareness	Readiness
Awareness	Pearson Correlation	1	0.54
	Sig. (2-tailed)		0.00
	N	20	20
Readiness	Pearson Correlation	0.54	1
	Sig. (2-tailed)	0.00	
	N	20	20
**. Correlation is significant at the 0.01 level (2-tailed).			

of Artificial Intelligence (AI) concepts (grand mean = 3.21, $SD \approx 0.67$, representing 80.25% of the maximum possible score). This indicates that while teachers are generally familiar with AI and recognise its relevance to education, their understanding remains largely foundational.

The awareness scores showed the highest agreement on items related to the importance of AI in teacher training ($M = 3.45$, $SD = 0.65$) and the impact of AI on future teaching methods ($M = 3.42$, $SD = 0.64$), suggesting that teachers conceptually understand the significance of AI. However, the lower scores on formal training participation ($M = 2.79$, $SD = 0.85$) and staying updated with AI advancements ($M = 3.03$, $SD = 0.72$) indicate a gap between recognising AI's importance and actively engaging with AI-related professional development. The standard deviation of 0.85 for workshop attendance suggests considerable variation in teachers' exposure to formal AI training, possibly reflecting disparities in access to professional development opportunities across different schools.

This finding is consistent with previous studies. For example, Safar (2024) reported that teachers possess basic awareness of AI but require deeper conceptual understanding to apply it effectively in educational contexts. Similarly, Okafor and Anyanwu (2024) found that although Nigerian secondary school teachers are aware of AI tools, their utilisation in teaching and curriculum implementation remains limited.

Taken together, these findings suggest that many teachers are in a transitional stage—moving from awareness to application, but not yet fully equipped to integrate AI meaningfully into classroom practice.

The second finding shows that teachers exhibit a *moderate level of readiness* to teach AI concepts (grand mean = 2.78, $SD \approx 0.72$, representing 69.5% of the maximum possible score). While teachers demonstrate interest and some level of confidence, their readiness is constrained by limited pedagogical competence and insufficient practical experience.

The highest readiness score was recorded for motivation to learn more about AI ($M = 3.37$, $SD = 0.67$), with 93.6% of teachers expressing agreement, indicating strong intrinsic motivation. However, the lowest scores were observed for government-provided training opportunities ($M = 2.24$, $SD = 0.89$), resource availability ($M = 2.59$, $SD = 0.71$), and integration of AI into teaching ($M = 2.61$, $SD = 0.73$). The substantial gap of 1.13 points between the highest and lowest

rated items highlights systemic constraints that limit teachers' ability to translate motivation into practice. The readiness grand mean of 2.78 (69.5%) is significantly lower than the awareness grand mean of 3.21 (80.25%), suggesting that awareness outpaces practical readiness by approximately 10.75 percentage points.

This outcome may be attributed to gaps in teacher education programmes, which tend to emphasise general digital literacy rather than emerging technologies such as AI. In addition, the absence of sustained, hands-on professional development opportunities restricts teachers' ability to translate theoretical knowledge into classroom practice. This aligns with the findings of Sperling *et al.* (2024), who emphasised that meaningful integration of AI in education requires continuous, practice-oriented training that combines technical knowledge with pedagogical application.

The third finding reveals a ***moderate, positive, and statistically significant relationship*** between teachers' awareness of AI concepts and their readiness to teach AI ($r = 0.54$, $p < 0.01$, $r^2 = 0.29$). This indicates that increased awareness is associated with greater preparedness to integrate AI into instructional practices. The coefficient of determination ($r^2 = 0.29$) indicates that approximately 29% of the variance in teachers' readiness can be explained by their level of awareness of AI concepts. The remaining 71% of variance is attributable to other factors, including institutional support, access to resources, prior training, and individual teacher characteristics. This finding underscores the multidimensional nature of teacher readiness and suggests that while awareness-building is a necessary component of preparedness, it must be complemented by systemic interventions that address infrastructural and institutional barriers.

This finding is supported by existing literature, which highlights that teachers' knowledge and familiarity with technology significantly influence their readiness to adopt it in teaching. For instance, Ayanwale *et al.* (2022) found that teachers' understanding of AI concepts strongly predicts their willingness and ability to integrate AI tools into classroom instruction. Similarly, Chai *et al.* (2020) demonstrated that teachers with higher levels of technological and pedagogical knowledge are more prepared to implement emerging technologies effectively. Kim *et al.* (2022) further emphasised that awareness-building initiatives should be an integral part of professional development programmes to bridge the gap between knowledge and practice.

The statistically significant correlation ($p < 0.01$) provides strong evidence that awareness and readiness are systematically linked, suggesting that targeted interventions to enhance teachers' knowledge of AI concepts could yield measurable improvements in their preparedness to integrate AI into classroom instruction. However, the moderate strength of the relationship also cautions against overreliance on awareness-building alone, highlighting the need for comprehensive support systems that address multiple dimensions of teacher readiness.

CONCLUSION

The findings of this study indicate that secondary school teachers in Lagos State possess ***moderate levels of awareness and readiness*** to teach Artificial Intelligence (AI) concepts. While there is increasing recognition of the importance of AI in education, significant gaps remain in terms of deep understanding and practical teaching competence.

The disparity between awareness (grand mean = 3.21, 80.25%) and readiness (grand mean = 2.78, 69.5%) represents a gap of approximately 10.75 percentage points, suggesting that teachers' conceptual understanding of AI outpaces their practical preparedness to integrate it into classroom instruction. This gap is most pronounced in areas requiring institutional support, including access to resources, government-provided training, and opportunities for hands-on application.

The study further establishes a statistically significant moderate positive relationship between awareness and readiness ($r = 0.54$, $p < 0.01$), suggesting that improving teachers' knowledge of AI is essential for enhancing their instructional preparedness. The coefficient of determination ($r^2 = 0.29$) indicates that approximately 29% of the variance in readiness can be explained by awareness levels, highlighting the importance of awareness-building as a component of teacher preparation while also acknowledging the role of other factors.

This highlights the need for structured learning pathways that move teachers beyond basic awareness toward practical application and classroom integration. The findings suggest that teacher development programmes should be designed to address both conceptual understanding and practical skills, with particular attention to overcoming systemic barriers such as resource limitations and inadequate institutional support.

Overall, the findings emphasise the importance of systemic support. Without targeted efforts to strengthen teacher capacity through training, resource provision, and institutional backing, the integration of AI into secondary education may remain limited and ineffective.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

- 1) *Integration of AI into Teacher Education*: Educational policymakers should incorporate AI literacy and pedagogical strategies into teacher education programmes to ensure that teachers acquire relevant competencies from the early stages of their training.
- 2) *Continuous Professional Development*: Teachers should be provided with sustained, hands-on professional development programmes focused on AI concepts, tools, and classroom applications. Such programmes should emphasise practical engagement and collaborative learning.
- 3) *Provision of Infrastructure and Resources*: Governments and school administrators should invest in digital

infrastructure, including reliable internet access and AI-enabled learning tools, to support effective classroom integration.

- 4) *Strengthening Institutional Support Systems*: Educational institutions should create supportive environments that encourage innovation and experimentation with AI in teaching, including policy frameworks and leadership support.
- 5) *Future Research*: Future studies should examine the long-term effects of professional development initiatives and infrastructural improvements on teachers' readiness and student learning outcomes across diverse contexts.

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Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/ or falsification, double publication and/or submission, and redundancy has been completely observed by the authors.

Life Science Reporting

No life science threat was practised in this research.

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