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Abstract

The integration of Artificial Intelligence (AI) in education holds immense potential to enhance teaching and learning. However, its effective adoption depends on teachers' readiness, which is influenced by factors such as demographic characteristics, AI familiarity, self-efficacy, perceived benefits, challenges, and institutional support. This study assesses the AI readiness of selected teachers in the Northern Region of Ghana using a quantitative research approach. A structured survey was administered to 300 teachers across various educational levels and subject specializations. Findings reveal a balanced gender representation (51.3% female, 48.7% male) and diverse teaching experience, with 36.7% having 1–5 years of experience. While STEM teachers form the largest group (47.7%), Senior High School teachers constitute the majority (39.3%). AI familiarity varies, with 37% reporting high or very high familiarity, whereas 39.6% have low or very low familiarity. Statistical analysis indicates no significant relationship between AI familiarity and teaching experience ($p = .096$) or gender ($p = .506$). Teachers demonstrate moderate self-efficacy in AI use, with confidence levels averaging between 2.89 and 2.97 on a 5-point scale. Perceived benefits include workload reduction ($M = 3.00$) and personalized learning ($M = 2.87$), while key challenges encompass inadequate training ($M = 3.08$), limited infrastructure ($M = 3.00$), and ethical concerns ($M = 2.92$). Institutional support is moderate, with school encouragement ($M = 3.07$) ranking highest. To enhance AI readiness, the study recommends AI-focused professional development, investment in infrastructure, and dedicated technical support. Strengthening institutional policies, addressing ethical concerns, and fostering AI awareness through engagement initiatives will be critical for successful integration. AI adoption can be effectively leveraged to transform education in Ghana when these gaps are addressed.

Introduction

Artificial Intelligence (AI) is changing education with personalized learning, automated grading and intelligent tutoring systems. These innovations in the industry give teachers tools to improve instruction, administrative tasks and cater for diverse student needs (Oseremi et al., 2024). Tools powered by AI such as adaptive learning platform, natural language processing tools and assisted assessments can lead to paradigm shift in teaching-learning practices (Strielkowski et al., 2024). But the success of AI in education isn't just a matter of the

technology itself, it's a matter of teachers' abilities to integrate these tools into their pedagogy.

Success in Teachers AI adoption in education can be measured with different dimensions. These dimensions cover areas such as familiarity with AI tools, confidence in using them, perceived benefits, challenges and levels of institutional support for AI in use (Oved & Alt, 2025). So teachers with strong digital literacy skills and positive attitude to technology and AI will be more capable to harness the potential of AI to enhance teaching and learning outcomes. Barriers to AI Adoption can get severely adversely affected by those who lack the knowledge, confidence or access to necessary resources, which can lead to resistance (Ofosu-Ampong, 2024).

In a country like Ghana where teachers vary in technology literacy, assessing teachers' readiness to adopt AI is important. Moving forward, the country's education sector has progressed in integrating technology within classrooms, yet challenges remain, including infrastructure deficit, a low level of training in technology use among educators as well as skepticism towards the use of AI tools in education (Osondu et al., 2024). The insights from this study will benefit policymakers, school authorities and teacher training centers as they help understand how teachers in the Northern Region of Ghana perceive AI tools and their willingness to adopt them in their pedagogical practices.

This study aims to evaluate the readiness of instructors to implement AI tools in the classroom by investigating factors such as self-efficacy, AI awareness, perceived benefits and challenges, and institutional support. The results will contribute to the ongoing discourse on digital transformation in education and will provide guidance on the most effective strategies for the integration of AI in schools. This study will assist in the development of targeted professional development programs and policy interventions to provide teachers with the necessary skills and resources for AI-driven education by identifying knowledge gaps, confidence gaps, and support system gaps.

Problem Statement

Although there is growing global interest in technology and artificial intelligence (AI) for education, there is little research on Ghanaian teachers' preparedness to use AI tools in their classrooms. While some studies have shown that AI powered educational technologies such as intelligent tutoring systems, automated grading software and adaptive learning platforms can enhance instructional effectiveness and personalize student learning experiences (Ayeni et al., 2024). But adoption of AI in education largely depends on teachers' readiness which includes their knowledge, confidence, attitude and institutional support for AI integration (Osondu et al., 2024).

In the Northern Region, as opined be Soma et al. (2021) that digital literacy, lack of technological resources and varying teacher training in emerging educational technologies are big challenges to technology adoption (Soma et al., 2021). Many teachers may not be aware of AI tools or feel they are not prepared to use them in their teaching practice (UNESCO, 2023). Furthermore, concerns related to infrastructure, ethical considerations, and resistance to change may hinder AI implementation in classrooms (Rane et al., 2024). Without a clear understanding of these factors, efforts to promote AI adoption in education may face resistance or yield suboptimal results.This study seeks to address this gap by systematically assessing the readiness of teachers in the Northern Region of Ghana

to use AI tools in their classrooms. Through assessing teachers' awareness, confidence, perceived benefits and challenges, and the extent of institutional support available, this research will provide empirical evidence on the state of AI preparedness among educators especially in developing regions.

Research Objectives

The study seeks to:

1. Understand how well teachers are acquainted with AI tools in the classroom.
2. Assess their confidence levels in integrating AI into their teaching practices.
3. Identify the potential advantages and challenges they associate with AI adoption.
4. Examine the extent to which institutional support impacts their readiness to use AI.

Research Questions

1. To what degree are teachers familiar with AI-powered tools in education?
2. How comfortable and confident do they feel in using these tools for instructional purposes?
3. What benefits and challenges do teachers perceive in adopting AI in their classrooms?
4. How does the availability of institutional support influence teachers' readiness to use AI technology in classroom?

Literature Review

Artificial Intelligence (AI) is providing innovative solutions that enhance teaching and learning (Oseremi et al., 2024). One of the most outstanding AI applications in education is intelligent tutoring systems (ITS). This application provide students with real-time, personalized feedback and guidance based on their learning progress (Ayeni et al., 2024). These systems use machine learning algorithms to adapt instructional content to individual student needs thereby helping to address learning gaps and improve comprehension (Graesser et al., 2018). ITS platforms, such as Carnegie Learning's MATHia and IBM's Watson Tutor, have demonstrated the ability to improve student performance by providing specialized support beyond the capabilities of traditional classroom instruction (Koceska et al., 2024).

One significant AI innovation is automated grading and assessment tools, which reduce the administrative load on teachers by evaluating student assignments, test, and exams (Strielkowski et al., 2024). AI-powered grading systems, such as Turnitin's AI-driven plagiarism detection and Google's AutoML for essay scoring, enable educators to provide faster and more consistent feedback (Graesser et al., 2018). These tools help improve assessment efficiency and allows teachers to focus more on teaching activities and student engagement. However, concerns regarding the accuracy, fairness, and ethical implications of AI grading systems remain critical areas of discussion in educational research (Zawacki-Richter et al., 2019).

Also, systems like Knewton and DreamBox Learning analyze student interactions with digital content to

customize lessons, ensuring that learners receive the appropriate level of challenge and support (Sahu, 2024). This level of personalization enhances student engagement, promotes self-paced learning, and addresses individual differences in learning styles (Rane et al., 2023). On the other hand, platforms like Squirrel AI and Quizlet's AI-powered study tools provide teachers with automated content suggestions based on curriculum requirements (Sur et al., 2024).

Despite these great advancement, the adoption of AI in education is agued to not only dependent on its technological capabilities; rather, it relies heavily on teacher competence, confidence, and willingness to integrate AI into their instructional practices. Educators need adequate training, digital literacy skills, and institutional support to effectively incorporate AI tools into their teaching methodologies (Rane et al., 2024). Studies indicate that while many teachers recognize the potential benefits of AI, concerns about data privacy, ethical considerations, and the fear of AI replacing human teachers contribute to hesitancy in adoption (Ayeni et al., 2024; Oseremi et al., 2024). Additionally, access to AI infrastructure, particularly in resource-constrained environments such as parts of Ghana, remains a critical barrier to widespread integration of technology (Soma et al., 2021).

Given these considerations, assessing teacher readiness for AI adoption is essential in determining how best to support educators in leveraging AI for improved teaching and learning especially in developing regions of a developing country. Understanding teachers' awareness, self-efficacy, perceived benefits and challenges, and institutional support will provide insights into the conditions necessary for successful AI integration in classrooms.

Teacher Readiness and Technology Adoption

A study by Lyu et al. (2025) found that while many instructors reported moderate to high familiarity with GenAI, their actual use of these tools for instructional purposes was limited. The study also revealed that trust and distrust in GenAI are not simply opposites, as an instructor can simultaneously exhibit both. Furthermore, familiarity with GenAI varied significantly among instructors with different levels of trust and skepticism. These findings highlight the need for balanced and informed perspectives to support educators in effectively incorporating GenAI into their teaching practices (Lyu et al., 2025).

Research also shows that institutional factors, including professional development opportunities, school policies, and access to technological resources, significantly shape teacher readiness for technology adoption (Tondeur et al., 2017). Teachers who constantly receive training and support from school leadership demonstrate greater confidence and competence in using educational technology (Voogt et al., 2018). In addition, other factors like teaching experience and subject taught by teachers can also influence their readiness. Though STEM educators often exhibiting higher levels of technological familiarity than their counterparts in humanities and social sciences (Li et al., 2025). Even with these variations, fostering a technology-positive culture within schools, in addition to specified professional development programs, can increase teachers' readiness and encourage sustained technology use in education. Therefore, addressing both individual and institutional factors is essential in ensuring teachers are equipped to adopt and integrate digital tools effectively in the classroom.

Methodology

Research Design

The study adopted a quantitative survey research design, which is suitable when collecting numerical data that can be analyzed statistically (Sarantakos, 2005). This design allows for an objective assessment of teacher readiness to adopt AI tools in the classroom by gathering data from a large sample of teachers at a single point in time. A structured questionnaire was used as the primary data collection instrument due to its efficiency in gathering standardized responses across multiple respondents (Martin & Bridgmon, 2012). The questionnaire comprised of closed-ended and 5 – point Likert-scale questions, enabling the researchers to quantify variables such as familiarity, confidence, perceived benefits, and institutional support for AI adoption. The quantitative approach facilitates the identification of patterns, trends, and relationships within the data, providing valuable insights for policymakers, educational leaders, and training providers in the Northern Region of Ghana (Martin & Bridgmon, 2012).

Population and Sampling

The study had a target population comprising pre-tertiary teachers (i.e., teachers working at the Basic and Senior High levels) in the Northern Region of Ghana. This region was selected due to its unique educational and technological challenges. This may influence teachers' readiness to adopt AI in teaching and learning. The population is diverse, including urban and rural schools, and representing a range of subject areas and teaching experience levels.A stratified random sampling technique was employed to ensure that the sample adequately reflects the population's diversity. The sample was stratified based on several key demographic variables: Gender, Subject Area and Teaching Experience. Thus, the study includes a diverse group of teachers, considering their years of experience, gender, and subject specialization to gain a well-rounded understanding of AI readiness in education.

The study had a target population consisting of all teachers in pre-tertiary schools in the Northern Region. A total of sample of 300 teachers were randomly selected from a mix of urban and rural schools. This sample size is adequate to provide statistical power and allow for meaningful comparisons across the different demographic groups (Chanuan et al., 2021).

Data Collection Instrument

A Survey instrument was designed for this study. The instrument seeks to assess different aspects of teacher readiness for AI adoption in the classroom. It consists of five key sections:

1. *Demographics* – data collected on age, gender, teaching experience, and subject area to analyze differences in AI readiness.
2. *AI Familiarity* – seeks to measure teacher's awareness and exposure to AI tools in education, such as intelligent tutoring systems and adaptive learning platforms.
3. *AI Self-Efficacy* – Assessed teacher's confidence in integrating AI into teaching practices, including

lesson planning and student assessments.

4. *Perceived Benefits and Challenges* – this examined expected advantages (e.g., increased student engagement, reduced workload) and challenges (e.g., ethical concerns, lack of infrastructure).
5. *Institutional Support* – Evaluated school and system-level support, including professional development opportunities and access to AI-related resources.

The survey uses *a 5-point Likert scale (*1 = Strongly Disagree to 5 = Strongly Agree) to quantify teachers' attitudes and perceptions, enabling standardized comparison and statistical analysis.To ensure validity and reliability, the questionnaire underwent expert review and pilot testing (Sarantakos, 2005). Educational technology and measurement experts assessed the instrument for content validity, ensuring alignment with the study objectives. A pilot study was conducted with 30 teachers who were not part of the main sample. Their responses were analyzed for internal consistency using Cronbach's alpha, and necessary modifications were made to improve clarity and reliability before full deployment. The reliability of the survey was found to be *0.82*, indicating good internal consistency.

Data Analysis

The data from the responded questionnaires were analyzed using both descriptive and inferential statistics with the aid of *SPSS,* a widely used statistical software for quantitative research. All statistical significance were determined at the *0.05* level, and the results interpreted to inform recommendations for policy and practice in teacher training and AI integration in Ghana's educational system.

1. *Descriptive Statistics*: The descriptive statistics was used to summarize the data and present an overview of teachers' AI readiness. Measures such as *mean, frequency distributions*, and *percentages* were employed to describe teachers' familiarity with AI tools, their confidence levels, the perceived benefits and challenges, and the extent of institutional support. This provided a clear picture of the overall readiness of teachers in the Northern Region.
2. *Chi – Square*: This test was used in the analysis to examine whether there was a significant association between teachers' knowledge of AI and two key demographic variables: teaching experience and gender.

Ethical Considerations

All participants were informed of the study's objective, the voluntary nature of their participation, and their right to withdraw at any time without penalty. Their confidentiality was guaranteed and maintained throughout the research process.

Results

Demographic Characteristics

This section presents an overview of key attributes, including gender, teaching experience, subject specialization, and teaching level. The table below summarizes the demographic distribution of the respondents in this study.

Table 1. Demographic Data

Variable	Category	Frequency	Percent	Valid Percent	Cumulative Percent
Sex	Male	146	48.7	48.7	48.7
	Female	154	51.3	51.3	100.0
	Total	**300**	**100.0**	**100.0**	**100.0**
Teaching Experience	1–5 years	110	36.7	36.7	36.7
	6–10 years	66	22.0	22.0	58.7
	11–15 years	67	22.3	22.3	81.0
	More than 15 years	57	19.0	19.0	100.0
	Total	**300**	**100.0**	**100.0**	**100.0**
Subject Taught	STEM	143	47.7	47.7	47.7
	Social Science	57	19.0	19.0	66.7
	Language	61	20.3	20.3	87.0
	Business	39	13.0	13.0	100.0
	Total	**300**	**100.0**	**100.0**	**100.0**
Level of Teaching	Primary	87	29.0	29.0	29.0
	JHS	95	31.7	31.7	60.7
	SHS	118	39.3	39.3	100.0
	Total	**300**	**100.0**	**100.0**	**100.0**

The study sample comprises 300 teachers who are distributed almost equally between male and female participants totaling 146 males (48.7%) and 154 females (51.3%). The teacher participants have diverse lengths of teaching experience: 36.7% reported 1–5 years of experience and other groups divided at 22.3% for 11–15 years, 22% for 6–10 years and 19% for more than 15 years' experience in the field. The study sample shows that STEM fields represent half (47.7%) of teachers whereas languages and social sciences each contain 20.3% and 19% respectively and business subjects make up 13%. The participants teach in various educational stages from primary to junior high school (JHS) and senior high school (SHS) representing 29% and 31.7% and 39.3% respectively. This segmentation allows for broad teacher inclusion. This collection of demographic data about respondents created a complete picture of the teaching staff within the Northern Region of Ghana.

Familiarity of Teachers with AI Tools

Assessing teachers' familiarity with AI tools is crucial in understanding their readiness to integrate AI into classroom instruction. Teacher familiarity with AI will influences confidence, willingness to adopt AI, and the effectiveness of its implementation. This section showed the distribution of teachers' self-reported familiarity with AI tools, highlighting the extent to which they have been exposed to and understand AI applications in education. The table below summarizes the findings.

Table 2. Knowledge/Familiarity of AI

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Low	61	20.3	20.3	20.3
	Low	58	19.3	19.3	39.7
	Moderate	70	23.3	23.3	63.0
	High	60	20.0	20.0	83.0
	Very High	51	17.0	17.0	100.0
	Total	300	100.0	100.0	

Table 2 showed a mixed level of awareness and exposure. While 23.3% of respondents reported a moderate familiarity, a combined 37% (Very High and High) of teachers indicated strong familiarity with AI, suggesting that a significant proportion have some understanding of AI applications in education. However, a considerable 39.6% (Very Low and Low) of teachers reported limited familiarity, highlighting a potential knowledge gap. This variation suggests that while some teachers are well-acquainted with AI, a substantial number may require targeted training and capacity-building initiatives to enhance their readiness for AI integration in the classroom.

Table 3.Chi-Square Tests on Teaching Experience and AI Knowledge

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	18.692[a]	12	.096
Likelihood Ratio	18.725	12	.095
Linear-by-Linear Association	.644	1	.422
N of Valid Cases	300		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.69.

Table 3 presents the chi-square test results examining the association between teaching experience and AI knowledge among teachers. The Pearson Chi-Square value ($\chi^2 = 18.692$, df = 12, p = .096) indicates that there is no statistically significant relationship between teaching experience and AI knowledge at the conventional significance level of 0.05. Similarly, the Likelihood Ratio test (p = .095) and the Linear-by-Linear Association test (p = .422) suggest no clear trend linking years of teaching experience to AI knowledge. This implies that AI familiarity is not necessarily dependent on teaching tenure, and both early-career and experienced teachers demonstrate varying levels of AI knowledge.

Table 4.Chi-Square Tests on Gender and AI Knowledge

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.318[a]	4	.506
Likelihood Ratio	3.346	4	.502
N of Valid Cases	300		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 24.82.

Table 4 presents the Pearson Chi-Square test ($\chi^2 = 3.318$, df = 4, p = .506) indicating no statistically significant association between sex and AI knowledge. This suggests that gender does not play a critical role in determining familiarity with AI tools among teachers, as both male and female respondents showed comparable levels of AI knowledge. Other factors may have a greater influence on AI knowledge.

Teacher Self-Efficacy in AI Usage

Teacher self-efficacy in using AI tools is a very important factor in the successful integration of AI into classroom instruction. Self-efficacy reflects teachers' confidence in their ability to plan lessons with AI, integrate AI with ease, evaluate its benefits, and believe in its overall effectiveness. The table below presents the descriptive statistics on teachers' self-efficacy in using AI tools.

Table 5 showed that the analysis of teachers' confidence in using AI tools for instructional purposes reveals moderate confidence levels across different AI-related tasks. The mean scores for confidence in lesson planning (2.97), integrating AI with minimal assistance (2.90), evaluating AI benefits (2.89), and belief in AI effectiveness (2.93) all hover around the midpoint of the scale (1–5). This suggests that, on average, teachers neither feel completely unprepared nor highly confident in using AI for teaching.

Table 5. AI Self-Efficacy

	Confidence in lesson planning	Integrating AI with minimal assistance	Evaluating AI benefits	Belief in AI effectiveness
Mean	2.97	2.90	2.89	2.93
Std. Deviation	1.426	1.442	1.422	1.440
Minimum	1	1	1	1
Maximum	5	5	5	5

The standard deviations (ranging from 1.422 to 1.442) indicate some variability in responses, meaning that while some teachers feel confident, others may lack the necessary skills or experience to integrate AI effectively. The minimum score of 1 (low confidence) and maximum score of 5 (high confidence) across all categories highlight that confidence levels are not uniform, with some teachers being highly confident while others struggle with AI integration.

Perceived Benefits of AI Adoption in the Classroom

AI integration in education has the potential to enhance teaching effectiveness by improving student engagement, personalizing learning experiences, and reducing teachers' workload. However, the extent to which educators recognize these benefits varies. The table below presents teachers' perceptions of AI's advantages in the classroom.

Table 6. Perceived Benefits

		AI improves student engagement	AI personalizes learning	AI reduces workload
N	Valid	300	300	300
	Missing	0	0	0
Mean		2.85	2.87	3.00
Std. Deviation		1.394	1.420	1.408
Minimum		1	1	1
Maximum		5	5	5

The analysis of teachers' perceptions of AI benefits in education in Table 6, based on the mean scores, reveals mixed attitudes toward its implementation. The statement "AI reduces workload" received the highest mean score (M = 3.00, SD = 1.408), indicating that teachers generally acknowledge AI's potential to ease their responsibilities, such as grading and lesson planning. However, the moderate score suggests that while some teachers strongly believe in AI's efficiency, others remain uncertain or skeptical. The perception of "AI personalizes learning" (M = 2.87, SD = 1.420) and "AI improves student engagement" (M = 2.85, SD = 1.394) follows a similar trend. While these means lean toward agreement, they are not adequately high, indicating that teachers may not yet fully trust AI's ability to adapt instruction to individual student needs or enhance engagement. The relatively high standard deviations suggest diverse opinions among respondents, possibly influenced by varying levels of exposure to AI tools.

Perceived Challenges of AI Adoption in the Classroom

While AI presents numerous opportunities for enhancing teaching and learning, its adoption in education also comes with challenges. Some teachers still struggle with issues such as ethical concerns, inadequate infrastructure, and insufficient training, all of which have impact on their readiness to integrate AI into their instructional practices. The table below presents teachers' perceptions of these challenges.

Table 7. Challenges of AI Adoption

		AI raises ethical concerns	Lack of infrastructure hinders AI	Need more AI training
N	Valid	300	300	300
	Missing	0	0	0
Mean		2.92	3.00	3.08
Std. Deviation		1.410	1.462	1.328
Minimum		1	1	1
Maximum		5	5	5

The analysis of teachers' perceptions of AI-related challenges in Table 7 indicates that the need for more AI training is the highest concern, with the highest mean score (M = 3.08, SD = 1.328). This results shows that many teachers feel not prepared to integrate AI tools effectively into their teaching practices, emphasizing the necessity for professional development programs. The lack of infrastructure (M = 3.00, SD = 1.462) is another critical barrier to AI adoption. The relatively high standard deviation implies that even though some teachers strongly agree that infrastructure challenges hinder AI integration in the classroom, others may have better access to technological resources. This finding highlights disparities in resource availability across schools, particularly between urban and rural areas. Also, ethical concerns surrounding AI (M = 2.92, SD = 1.410) are also acknowledged by teachers, though with slightly less emphasis. This indicates that while some teachers recognize potential ethical dilemmas such as data privacy and biases in AI-driven assessments, others may not perceive these issues as major obstacles.

Institutional Support for AI Adoption

Factors like an access to AI tools, encouragement from school leadership, availability of technical support, and government policies play an important role in shaping teachers readiness to use AI. The table below presents teachers' perceptions of the institutional support available for AI adoption.

From Table 8, the analysis of institutional support for AI adoption showed moderate perceptions among teachers regarding the availability of resources and encouragement from their institutions. "School encourages AI use" recorded the highest mean score (M = 3.07, SD = 1.322), revealing that some schools promote AI use in teaching, though not universally. "Government supports AI integration" (M = 3.01, SD = 1.428) and "School provides AI tools" (M = 2.99, SD = 1.436) indicate that while some teachers acknowledge these forms of support, many may still feel that AI resources and policies are insufficient.

Table 8. Institutional Support for AI Adoption

		School provides AI tools	**School encourages AI use**	**Technical support available**	**Govt supports AI integration**
N	Valid	300	300	300	300
	Missing	0	0	0	0
Mean		2.99	3.07	2.96	3.01
Std. Deviation		1.436	1.322	1.448	1.428
Minimum		1	1	1	1
Maximum		5	5	5	5

The lowest mean was observed for "Technical support available" (M = 2.96, SD = 1.448), highlighting a possible lack of adequate assistance for teachers in implementing AI. The relatively high standard deviations across all variables suggest diverse experiences, likely influenced by differences in school infrastructure, administrative priorities, and policy implementation.

Discussion

The purpose of this study was to assess teachers' readiness to use AI tools in the classroom by examining their familiarity with AI, self-efficacy in AI adoption, perceived benefits and challenges, and the role of institutional support. The findings provide valuable insights into the current state of AI readiness among teachers in the Northern Region of Ghana. The researchers found in the study that teachers showed different levels of familiarity with AI tools, with 23.3% of them showing a moderate level, while 20.3% and 19.3% indicated very low and low familiarity, respectively. This suggests that a considerable proportion of teachers are still in the early stages of AI awareness. The chi-square test results ($\chi^2 = 18.692$, df = 12, p = .096) indicate that familiarity with AI is not significantly associated with teaching experience, implying that both early-career and experienced teachers exhibit similar levels of AI knowledge. Additionally, the chi-square test examining gender differences in AI knowledge ($\chi^2 = 3.318$, df = 4, p = .506) shows no statistically significant relationship between sex and AI familiarity, suggesting that male and female teachers are equally likely to have varying levels of AI knowledge. These findings align with prior research suggesting that technology adoption in education does not necessarily increase with years of teaching experience (Ofosu-Ampong, 2024) and no significant association between gender and AI familiarity, reinforcing that AI adoption is not inherently gender-dependent (Iddrisu et al., 2025). The results highlight the need for targeted AI literacy programs that cater to all teachers, regardless of experience or gender, to enhance their exposure and competence in using AI tools effectively.

Also, Teachers demonstrated moderate confidence in utilizing AI for instructional purposes. The mean scores for confidence in lesson planning (M = 2.97, SD = 1.426), integrating AI with minimal assistance (M = 2.90, SD = 1.442), evaluating AI benefits (M = 2.89, SD = 1.422), and belief in AI effectiveness (M = 2.93, SD = 1.440) suggest that while teachers recognize the potential of AI, their confidence levels remain uncertain. These findings resonate with studies by Osondu et al. (2024) and Zawacki-Richter et al. (2019), which emphasize the importance of professional development programs in enhancing teachers' confidence in technology adoption. The variation in the standard deviations suggests that whereas some teachers feel adequately prepared to use AI, others may require additional training and support.

Also teachers noted several benefits of AI with the highest mean score for "AI reduces workload" (M = 3.00, SD = 1.408). This is in line with existing literature that shows AI can automate administrative tasks so teachers can focus more on teaching (Rane et al., 2024; Sur et al., 2024). Teachers also perceived benefits of AI in personalizing learning (M = 2.87, SD = 1.420) and student engagement (M = 2.85, SD = 1.394). However, the scores are moderate and teachers may not fully trust AI to improve instruction yet (Rane et al., 2024). The high standard deviations for these variables suggest teachers may have different opinions possibly due to their prior experience with AI in education. Despite the benefits of AI teachers also reported some challenges. The highest mean score was for more AI training (M = 3.08, SD = 1.328) so many teachers feel unprepared to use AI in the classroom. Infrastructure (M = 3.00, SD = 1.462) and ethical issues (M = 2.92, SD = 1.410) were also major obstacles to AI adoption. This is in line with previous studies that have found lack of training and infrastructure as major challenges in integrating AI in education (Ayeni et al., 2024; Oseremi et al., 2024). We need to invest in AI training and digital infrastructure as also stipulated by Ghimire et al. (2024).The study also looked at institutional

support for AI. The results showed that schools provide moderate support for AI adoption with "School encourages AI use" getting the highest mean score (M = 3.07, SD = 1.322). However, access to AI tools (M = 2.99, SD = 1.436), technical support (M = 2.96, SD = 1.448) and government support (M = 3.01, SD = 1.428) was lacking in some schools. So while some institutions are trying to promote AI integration, there's still room for improvement in providing the necessary resources and support. Miao et al. (2021) also found that policy frameworks play a big role in AI readiness among educators.

Implications for Policy, Teacher Education, and Classroom Practice

The findings of the study have several implications for various stakeholders and teacher education Here are the key implications:

1. *Policy Makers and Educational Authorities*: The findings have been emphasizing a need for certain policies that may help in the integration of AI in education. The government needs to make a strategic investment in infrastructure, professional development programs, and technical support for teachers. Besides this, policy framers need to lay down guidelines so that privacy and fairness are assured in AI use in classrooms. Educational authorities also need to make economic provisions and equipment such that AI technologies become distributed among schools equitably, especially in backward areas.
2. *Teacher Education Institutions*: Since the education landscape is changing with AI, teacher preparation programs must change with it, adding AI training to their curricula. They should be trained not only in pedagogy, but also in how to use AI tools effectively in teaching and learning. Schools should therefore create specialized professional development courses that introduce the different types of AI technologies, and how they can be used in the classroom. In order to incentivize long-term engagement with AI, a continuous and effective training program for teachers will need to be established.
3. *School Administrators and Institutions*: Apart from computers and infrastructure (like reliable internet access) to use AI successfully, schools and institutions need to invest in training resources on how to leverage AI effectively. Ministries have to create an atmosphere of support: cultivate or better yet create a culture of innovation and empower teachers to experiment with AI tools. The administrators need to put in place support systems, like dedicated technical assistance and mentorship programs, to help teachers mitigate any challenges they face with integrating AI.
4. *Teachers:* Teachers should be constantly learning about AI to feel more comfortable and confident with it. By using AI tools, teachers can enhance student learning, personalize instruction and reduce administrative burden. Teachers can also be advocates for better resources and professional development to match the changing needs of education.
5. *Students:* AI in the classroom can benefit students with personalized learning experiences, real time feedback and adaptive learning. It can also teach them digital literacy for a world that is becoming increasingly technology driven.

Conclusion

This study examined the propensity of teachers to use AI tools in classrooms by investigating awareness, self-

efficacy in perceived usefulness, and challenges to be addressed through institutional support. The results indicate that teachers had a moderate ranking of familiarity with AI tools. However, teachers' confidence was mixed in the integration of AI into instruction. Most teachers recognize the potential of AI to improve student engagement, personalize learning, and reduce workload; however, ethical concerns, a lack of infrastructure, and insufficient training are reasons teachers remain skeptical. Besides, institutional support for AI adoption is uneven-once some schools encourage the use of AI, whereas others lack technical resources and policy guidance.

The chi-square analyses also yielded no significant associations between demographic variables, such as gender and teaching experience, and teachers' knowledge of AI; maybe this again suggests that perhaps exposure to AI tools is not systematically influenced by such variables. In sum, while teachers recognize the benefits brought about by AI, to a great extent, their actual use of these tools will be built on greater support, training, and infrastructure development. Strengthening these aspects will be essential for developing AI readiness and successful integration into the classroom.

Recommendations

Based on the findings of this study, the following recommendations are proposed to enhance teachers' readiness for AI integration in the classroom:

1. Educational institutions and policymakers should prioritize AI-centered professional development programs. Workshops, practical training sessions, and continuous learning opportunities will equip teachers with the necessary skills and confidence to integrate AI tools effectively.
2. Schools should invest in the necessary infrastructure, including reliable internet access, AI-compatible devices, and software. Additionally, dedicated technical support teams should be established to assist teachers in troubleshooting AI-related challenges.
3. Schools and educational authorities must implement clear policies that encourage AI adoption. Government agencies should collaborate with stakeholders to provide schools with AI tools, resources, and funding to ensure equitable access and integration.
4. AI training programs should include ethical considerations, ensuring that teachers understand data privacy, bias mitigation, and responsible AI usage. Policymakers should also establish guidelines to protect student data and uphold ethical AI implementation.
5. Educational institutions should foster an AI-positive culture by organizing discussions, seminars, and research initiatives that encourage teachers to explore AI’s benefits. Exposure to successful AI use cases in education can help reduce skepticism and increase adoption rates.

By implementing these recommendations, educational institutions can enhance teachers' readiness for AI integration, ensuring that AI tools are effectively utilized to improve teaching and learning outcomes.

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