

Integrating Artificial Intelligence (AI) in Principals' Communication Practices for Teachers Efficiency in Public Secondary Schools

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Abstract:

Background: The growing advancement of Artificial Intelligence (AI) has increasingly influenced educational leadership, particularly in enhancing communication practices, administrative efficiency, and teacher support. Despite the global recognition of AI as a tool for improving school management, its practical integration into principals' communication practices in Nigerian public secondary schools remains underexplored.

Purpose: This study investigated the integration of Artificial Intelligence (AI) in principals' communication practices and its association with teachers' efficiency in public secondary schools in Osun State, Nigeria.

Method: A cross-sectional descriptive survey design was adopted. Data were collected from 256 teachers selected through multistage sampling techniques using a structured questionnaire, and analysed using descriptive and regression statistics.

Results: The findings revealed that the awareness of AI integration in principals' communication practices was relatively high (Mean = 2.63). However, principals still relied and depended largely on traditional forms of communication, such as face-to-face interaction, official memos, staff meetings, and circulars (Mean = 2.98). The study further showed a low level of actual integration of AI tools in principals' communication practices (Mean = 2.42), indicating that AI awareness was mainly conceptual with limited practical application. Meanwhile, there was a relatively high level of teachers' efficiency (Mean = 2.99). The regression analysis indicated there was a significant association between principals' AI-supported communication practices and teachers' efficiency ($B = 0.611$, $\beta = 0.652$, $t = 13.65$, $p = 0.000$). The coefficient of determination ($R^2 = 0.425$) indicated that principals' AI-supported communication practices accounted for 42.5% of the observed variation in teachers' efficiency.

Conclusion/Implications: The study therefore concluded that principals' AI-supported communication practices were significantly associated with teachers' efficiency, although such association does not imply causation. The study implies that strengthening digital infrastructure, enhancing professional development, and establishing clear policy frameworks may support effective AI integration in school administration and improve communication efficiency in public secondary schools.

Keywords: *Artificial Intelligence, communication Practices, secondary schools, teachers' efficiency*

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Introduction

The swiftness in AI technology improvement is one of the factors that have been influencing the transformation of educational leadership. The improvement has particularly affected the communication among principals, the decision process, and the collaboration with the teachers aimed at enhancing the results in the schools. AI-based products like smart communication tools, fast feedback systems, and data analysis offer school leaders the potential to enhance operational efficiency, streamline information flow, and strengthen instructional support for teachers. The educational leaders are increasingly recognizing that the traditional administrative methods, especially communication with the teachers, can be significantly improved through strategic integration of AI enabling more timely, personalized, and data-informed interactions.

Principal's communication remains a decisive one among the factors contributing to the efficiency of teachers in public secondary schools in Nigeria. Various empirical studies have shown that the communication skills of the principal influenced the teacher's performance and delivery of lessons. However, this depends on the different leadership styles (Dairo et al., 2024). However, most of the research in Nigeria has concentrated on the traditional communication skills and what AI technologies could do for the school principal to communicate very well to the teachers, manage expectations, and foster their instructional development (Olowo, 2023).

In a recent study on educational leadership in Nigeria, it was found that school principals started to use AI in teaching and learning processes. This study revealed that majority of principals are moderate in their AI awareness and technological readiness. This resulted from lack of infrastructure and the insufficient number of trained professionals (Obano & Osagie, 2025). AI not only improved communication but also increased administrative efficiency (Obano & Osagie, 2025). This supported the importance of using AI in the leadership of schools when the leaders are well trained.

The use of AI in communication by the school heads corresponds to the global changes in digital and instructional leadership. The leaders are not only using technology for coordinating tasks but also for creating professional learning communities, supporting teachers' well-being, and making feedback loops rapid (Zeng et al., 2025). This trend could lead to a complete overhaul of the communication system utilized in schools by making it two-way, responsive, and based on data, thus making it easier for teachers to be more productive and for schools to perform better. This implies the usage of Artificial Intelligence (AI) in schools is getting more recognized and accepted as a powerful aid for better educational and communication leadership. However, the implementation of AI in communication practices among principals in Nigerian public secondary schools is not well researched. Majority of the principals seem depend on the old and manual ways of communication. This resulted in slow feedback, poor communication and less support for teachers. This consequently have negative influence on teachers' productivity and performance during the instructional period. Principals are reasonably aware of and accepted AI tools but there are problems of poor infrastructure, lack of digital skills, and no professional training (Obano & Osagie, 2025). Furthermore, weak policy frameworks and lack of ethical guidelines also constitute major factors that cut off the educational sector from the benefits of AI technology and thus the benefits of better management practices.

More also, despite the growing awareness of Artificial Intelligence (AI) in educational administration, existing studies in Nigeria have largely focused on AI adoption in teaching and learning processes rather than its integration into principals' communication practices and its relationship with teachers' efficiency. Furthermore, previous studies emphasized general technological readiness without specifically examining how principals' AI-supported communication practices relate to teachers' efficiency in public secondary schools. The reviewed literature did not identify sufficient empirical evidence on principals' AI-supported communication practices and teachers' efficiency in public secondary schools in Osun State (Olowo, 2023; Olowo & Ogungbemi, 2026). This study therefore addressed this gap by examining principals' existing communication practices, the level of awareness of AI integration, the extent of AI integration in communication practices, and the association between principals' AI-supported communication practices and teachers' efficiency in public secondary schools in Osun State. From the objectives of the study, research questions were raised as thus: what is the level of using existing principals' communication practices in public secondary schools in Osun State?; what is the level of awareness of Artificial Intelligence integration in principals' communication practices in public secondary schools in Osun State?; to what extent are Artificial Intelligence tools integrated into principals' communication practices in public secondary schools in Osun State?; what is the level of teachers' efficiency in public secondary schools in Osun State?; and what is the association between principals' AI-supported communication practices and teachers' efficiency in public secondary schools in Osun State?.

Review of Related Literature

Artificial Intelligence (AI) denotes systems of computers that are capable of executing the tasks, which conventionally demand human smartness like data interpretation, identification of patterns, and language processing (Chen et al., 2020). AI has emerged as a transformative force in the field of education, enabling data-driven decision-making, personalized learning experiences, and the development of intelligent systems of school administration. In instructional leadership, AI plays a critical role by automating routine tasks, generating predictive analytics, and supporting educators in designing adaptive instructional strategies (Ategwu et al., 2022; Luke & Uzoigwe, 2022). In the sphere of education, AI applications can help in reducing the time-consuming administrative tasks, giving immediate feedback, improving the communication between school administrators and teachers, and providing the necessary support for data-informed decision-making (Adams & Thompson, 2025).

Schools use AI technologies, which include machine learning algorithms and natural language processing and intelligent tutoring systems to boost teaching quality, student participation and school management productivity (Mbon & Uzoigwe, 2023). In addition, AI is increasingly influencing educational administration by providing tools that automate repetitive tasks and support data-driven school management. Globally, AI solutions are now used for timetable scheduling, grading, admissions processing, resource allocation, performance monitoring. These applications significantly reduce human workload while improving operational efficiency within educational institutions (Holmes et al., 2019).

Furthermore, artificial intelligence has become a disruptive innovation in the rapidly evolving educational landscape, how students learn, transforming how institutions are managed, and how administrators supervise educational processes (Alordiah, 2023b). AI-driven technologies are now integrated into many aspects of school administration, ranging from data-based decision-making to the automation of repetitive administrative tasks. As the development of AI continues, its influence extends beyond operational efficiency to affect educational governance and the wellbeing of school administrators (Alordiah, 2023a). The use of AI in the schools is generally a matter of the digital leadership of the principals, which means they would be able to staff the technology change, cooperate, and learn the integration of new teaching methods (Cheng & Wang, 2023). With AI, school leaders can easily juggle their teaching and non-teaching duties, examine student performance statistics, and offer support promptly whenever needed to ensure the latter's learning outcomes are better (Khosravi et al., 2022).

School leaders and teachers maintaining real-time, effective communication is necessary if teachers' effectiveness and school performance are to be improved. The heads of schools communicate and, in this way, make things clear, give feedback at the right time, make decisions together, and finally boost the morale of teachers (Fullan et al., 2024). Of course, conventional methods like memos and meetings still have their place in communication, but AI-assisted interaction via chatbots, dashboards, and data analytics, for example gives the advantage of speed, personalization, and being data-informed all at once (Adams & Thompson, 2025). Teachers' adoption of AI in classrooms is moderated by their perceptions, attitudes, and technological self-efficacy (Nazaretsky et al., 2022). Studies reveal that the usage of AI tools, which could make teaching more efficient, is also hampered by challenges like lack of training, poor technological infrastructure, and resistance to change (Ertmer et al., 2012). Communication and digital leadership by principals are critical in connecting these separate areas through technological promotion, professional development, and organizational support (Zeng et al., 2025). AI is of great help to them by assisting in mastering the vast amount of information, gaining productivity, and making the communication with teachers, students, parents, and educational authorities stronger (Zeng et al., 2025). By using AI tools, the communication becomes timely, clear, and customized, the errors are reduced, the routine tasks are performed automatically and the principals are left with the strategic and relational leadership functions to focus on (Northouse, 1999, 2025).

Artificial Intelligence (AI)-enabled communication tools are basically digital technologies that help school principals get better at communication, information keeping, feedback sharing, and making administrative choices inside the school system. Adams and Thompson (2025) said, AI tools improve leadership efficiency because, they help with swifter communication, handling information in real time, and coordinating school stakeholders more smoothly. In a similar way, Fullan et al. (2024) pointed out that AI-supported systems support school leadership via communication that is more responsive, faster feedback, and administrative practices that are guided by data rather than guesses. One notable AI-enabled communication tool that fits school principals well is automated messaging systems. These are AI-supported communication platforms that can send reminders, announcements, timetables, alerts, and general updates to teachers and staff automatically, using emails, SMS, or mobile applications. Adams and Thompson (2025) argued that these automated communication tools boost administrative efficiency by cutting down delays in spreading information, and by making sure communications arrive immediately. Another key tool is AI-powered dashboards. These dashboards give real-time, visual summaries of what is happening in school, including activity patterns, teacher results, attendance records, and administrative datasets. Khosravi et al. (2022) observed that dashboards assist school leaders with watching instructional work closely, following performance measures, and taking more solid administrative decisions, mainly through data visualization and analytics tools.

AI-enabled feedback and reporting systems are also crucial and important communication tools for school principals. They let principals create quick reports, monitor what teachers are doing, follow student progress, and send out timely feedback in an automatic way. Zawacki-Richter et al. (2019) noted that AI-supported reporting systems lower administrative pressure while also making communication more efficient and helping institutional management, run smoother. More importantly, AI analytics tools support school principals when it comes to gathering, processing, and analysing education data. With those tools, principals can promote communication patterns, staff needs, recurring performance issues, and operational difficulties. Zeng et al. (2025) highlighted that analytics tools help principals

make evidence-guided decisions that improve teachers' efficiency, instructional support and overall school management practices. In this study, the term AI-enabled communication tools means technological systems that principals can use to improve communication workflows, deliver feedback without delays, reinforce coordination, and help teachers in a more effective manner within public secondary schools.

Although, adoption of AI is mostly limited by financial constraints, poor digital literacy, and the lack of necessary infrastructure but study in Nigeria shows that the prevalence of AI knowledge among school managers is increasing (Obano & Osagie, 2025). Another study further emphasized that, principals' communication practices influence teachers' effectiveness and school administration (Dairo et al., 2024). Ategwu et al. (2022) highlighted that AI can improve administrative efficiency, communication, and instructional support when school leaders are adequately trained and supported.

Related international studies showed that AI supports data-driven decision-making, predictive analytics, automated communication, dashboards, reporting systems, and instructional management in educational institutions (Chen et al., 2020; Holmes et al., 2019; Khosravi et al., 2022). Some other studies also revealed that AI-supported communication improves leadership responsiveness, feedback systems, coordination, and administrative efficiency within schools (Adams & Thompson, 2025; Fullan et al., 2024; Zawacki-Richter et al., 2019). Furthermore, studies on technology adoption explained that, teachers' attitudes, AI literacy, digital competence, and technological self-efficacy influence AI adoption and integration in teaching and learning environments (Çayak, 2024; Ertmer et al., 2012; Nazaretsky et al., 2022; Pokrivcakova, 2023). Cheng and Wang (2023) and Zeng et al. (2025) established that principals' digital leadership and organizational support enhance teachers' competency in integrating AI into educational practices.

Adams and Thompson (2025) in their empirical studies discovered that AI integration leads to better administrative efficiency, improved leadership practices, and greater teacher support. This reveals the growing adoption of AI in education and its positive impact on administrative efficiency and teaching quality. Chen et al. (2020) reported that the integration of artificial intelligence in education enhances both administrative processes and instructional delivery. The AI tools can handle boring administrative tasks, analyse students' performance data, and even improve communication with staff and parents. AI, through real-time feedback and data-driven insights, allows the principals to set more achievable academic objectives, assess the progress made, and manage the resources in a more effective manner (Khosravi et al., 2022). Nevertheless, if not properly managed reliance on AI might lead to the loss of human interactions, empathy, and context-deciding skills, which are all crucial to effective school leadership (Fullan et al., 2024). School principals are to draw the line between AI efficiency and human judgment; otherwise, teachers would still feel supported and motivated while using AI for administrative and instructional purposes.

Principals who manage to harmonize AI into teaching practices can provide a boost to the teachers' efficiency through various means like personalized professional development, lessening the administrative burden, giving feedback timely, and creating a teaching culture that is informed by data (Adams & Thompson, 2025; Khosravi et al., 2022; Zeng et al., 2025). Teachers' AI literacy, attitudes, and access to resources determine the extent to which they benefit from AI-enhanced leadership (Çayak, 2024; Pokrivcakova, 2023). Besides, AI has become a bridge connecting the school principals and teachers with the help of prompt sharing of information, planning together, and providing support tailored to the instructional needs (Fullan et al., 2024). The synergy of AI tools and powerful digital leadership is the perfect recipe for elevating the quality of instruction, teacher commitment, and the entire school's performance. Conclusively, several studies reveal that artificial intelligence can reduce teachers' workload and enhance their information literacy. Teachers' perceptions toward AI remain varied, while many teachers acknowledge the role of AI in supporting professional development and improving teaching practices, some are not certain about the full benefits and implications of adopting this technology in educational settings (Xue & Wang, 2022).

The framework as shown in Figure 1 simply shows that principals' use of AI-enabled communication tools such as automated messaging, dashboards, feedback systems, chatbots, and analytics tools are the independent variables expected to influence teachers' efficiency, which is the dependent variable. Meanwhile, teachers' efficiency is viewed as a single construct reflecting teachers' efforts in timely task completion, classroom management, quality instruction delivery, among others. The framework equally indicates a positive association between principals' use of AI-enabled communication practices and teachers' efficiency. This means that effective use of AI communication tools by principals may be expected to predict teachers' performance, responsiveness, collaboration, and overall work effectiveness. In addition, the framework recognizes that some control or contextual factors such as teachers' digital competence, availability of ICT resources, school policies and support, leadership style, as well as school environment may contribute to the extent to which AI-enabled communication practices affect teachers' efficiency.

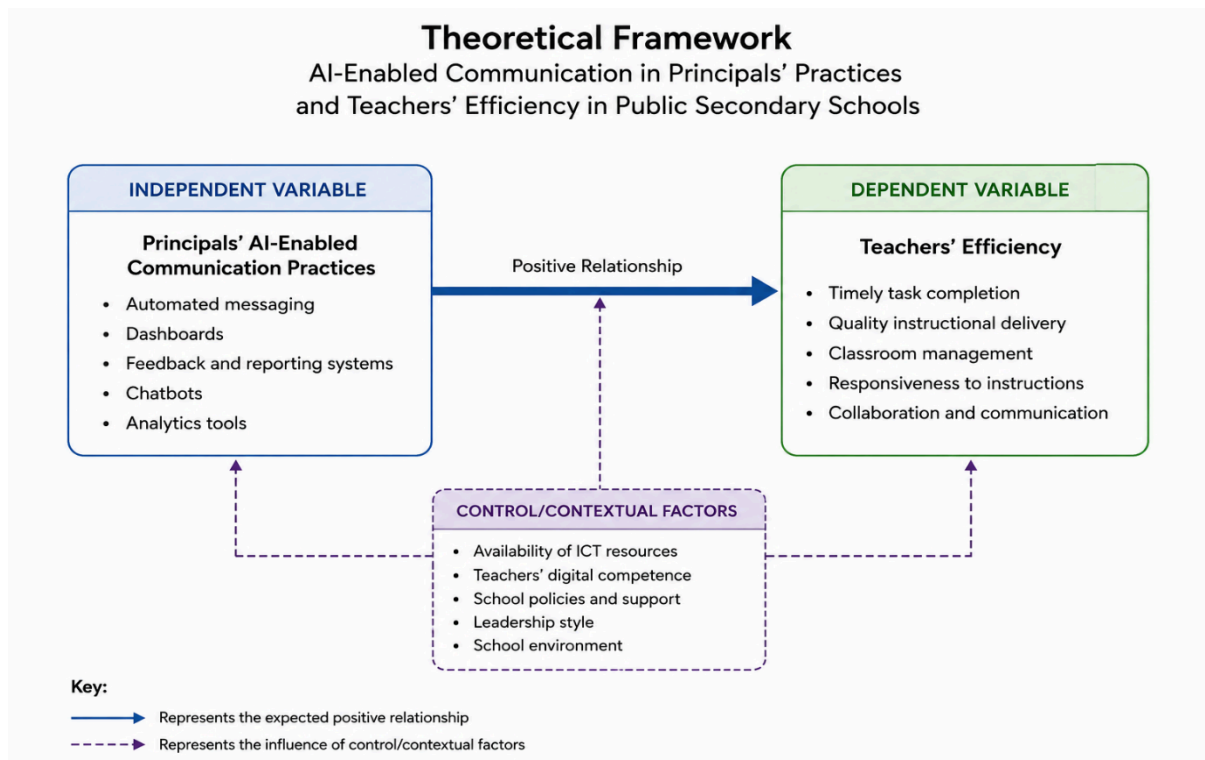


Figure 1: AI-enabled Communication Practices and Teachers' Efficiency

Theoretical Perspectives

Digital Leadership Theory highlights the role of the school management in giving rise to technology, through professional development and teacher support using digital tools. Digital leaders' competence influence teachers' acceptance of the AI tool, help with the communication practices and the quality of teaching to the ones who are involved (Alghamdi, 2024). This Theory explains how principals' ability to use digital and AI-supported communication tools can improve communication practices, teacher support, and teachers' efficiency in public secondary schools. The theory typically supports the study variables of principals' AI-supported communication practices and teachers' efficiency.

The Unified Theory of Acceptance and Use of Technology (UTAUT) argues that the use of technology is determined by performance expectations, effort expectations, social influence, and facilitating conditions (Zeng et al., 2025). The UTAUT model when applied to education indicates that principal's communication ability, teachers' attitudes, and organizational support play a key role in the adoption of AI and teacher's productivity at the schools.

The Diffusion of Innovation (DOI) Theory also gives insights into the distribution of AI technology among the educational environments, students, and teachers. Digital literacy, optimistic attitude, and readiness to incorporate AI in the practice of teaching are the educational leaders' assets that speed up the adoption process. In contrast, resistance, lack of proper training, and limited infrastructure are the barriers ((Rogers, 2003; Rogers et al., 2014). DOI explains how AI-supported communication practices spread and are adopted within schools. This denotes that digital literacy, readiness, and positive attitudes encourage AI integration, while inadequate training, resistance to change, and poor infrastructure limit the adoption of AI-supported communication practices in public secondary schools.

Summarily, Digital Leadership Theory explains principals' use of AI-supported communication practices measured in Sections B, C, and D of the questionnaire. The Unified Theory of Acceptance and Use of Technology (UTAUT) explains awareness and adoption of AI-supported communication practices measured in Sections C and D. Diffusion of Innovation Theory explains the spread and adoption of AI-supported communication tools measured in Sections C and D. Teachers' efficiency, measured in Section E, constitutes the dependent variable predicted by principals' AI-supported communication practices.

Research Method

The research design of this study was cross-sectional descriptive survey. A sample of 256 teachers out of 6,782 teachers in Osun State was selected for questionnaire administration. A multistage sampling procedure was adopted. First stage dealt with selection of four local government areas among 30 local government areas through a simple random sampling technique. The second stage involved selection of eight secondary schools in each L.G.A. through a purposive sampling technique, making a total number of 32 schools. In the third stage, simple random sampling technique was employed to select eight teachers who had spent at least three years in their respective school. This yielded a total sample size of 256 teachers for the study. The questionnaire contained five sections. Section A on demographic information about the respondents comprises of five items while Section B on existing communication usage by the principals consists of five items. Section C dealt with five items on AI integration awareness among the principals' communications. Section D looked at on extent of AI integration in the communication practices of the principals and itemized five items for the measurement while section E with have six items centred on teachers' efficiency. The 4-point Likert scale ranges from 1 to 4 was employed indicates 4 = Very High (VH), 3 = High (H), 2 = Low (L), 1 = Very Low (VL). The respondents for the study were teachers in public secondary schools in Osun State who claimed to be knowledgeable about AI. The teachers assessed and rated principals' AI-supported communication practices based on their daily interaction, feedback systems, observed communication patterns, administrative communication channels, as well as visible use of AI-supported tools within the schools. Specialists in Educational Management, Measurement and Evaluation at Obafemi Awolowo University, Ile Ife, Nigeria, established content validity of the instrument through their expert review. Their observations and suggestions guided in modifying and restructuring questionnaire before final administration. The pilot study was also conducted outside the sampled schools to pre-test the questionnaire within the period of two weeks among 41 teachers (16% of the total sample). This was to give room for further modification of the research instrument before final questionnaire administration was performed. This was followed by the final administration of the questionnaire to 256 teachers in public secondary schools in Osun State. A permission to carry out the research was sought from the principals of the schools. The questionnaires were personally distributed among the teachers, and all the 256 questionnaires were retrieved. This amounted to 100% response rate. The high rate of response resulted from personal contact with the teachers and immediate return of the questionnaires. The data collected through the questionnaires was coded with the aid of SPSS software version 20. The reliability test was carried out and the Cronbach's Alpha revealed a high overall reliability coefficient of 0.87 indicating that, the tool is very reliable. The Cronbach's Alpha of the sub-sections revealed as: Section B (0.81), Section C (0.84), section D (0.86), and section E (0.83). The use of descriptive and regression analysis techniques were used to analyse the data. The researchers used frequency counts, percentages, mean, and standard deviation to answer research questions 1 to 4. The decision rule was Mean $\geq$ 2.50 = High and Mean $<$ 2.50 = Low (The decision rule for interpreting mean scores was based on the midpoint of the 4-point Likert scale. A mean score of 2.50 and above was regarded as high, while a mean score below 2.50 was regarded as low). Regression analysis was used to determine the association between principals' AI-supported communication practices and teachers' efficiency to answer research question 5. Prior to conducting the regression analysis, the assumptions underlying linear regression were examined. Linearity was assessed using scatterplots to determine whether a straight-line relationship existed between principals' AI-supported communication practices and teachers' efficiency. Normality of residuals was examined using histogram plots and normal probability (P-P) plots, which indicated that the residuals were approximately normally distributed. Homoscedasticity was assessed by inspecting the scatterplot of standardized residuals against predicted values, and the variance appeared relatively constant across all levels of prediction. Multicollinearity was not applicable because only one predictor variable was included in the model. These diagnostic checks confirmed the suitability of the regression model for the analysis.

Result and Discussion

Result

Research Question 1

What is the level of using existing principals' communication practices in public secondary schools in Osun State?

Table 1: The Use of Existing Principals' Communication Practices (N = 256)

S/N	Items	VH	H	L	VL	Mean	SD	Decision
1	Use of staff meetings for information sharing	97	103	38	18	3.09	0.77	High

2	Use of circulars and official memos	90	95	44	27	2.98	0.84	High
3	Use of notice boards for communication	85	101	46	24	2.97	0.82	High
4	Use of face-to-face communication with teachers	102	96	39	19	3.10	0.79	High
5	Use of telephone calls and SMS for communication	71	87	61	37	2.75	0.95	High
Grand Mean						2.98	0.83	High

Table 1 reveals the usage of existing communication techniques by principals in public secondary schools in Osun State. The results show that grand mean of 2.98 (SD = 0.83) strongly suggests that traditional communication methods were widespread throughout the schools. The principal means of direct and face-to-face communication with teachers scored the highest mean (Mean = 3.10, SD = 0.79). This implies that the principals mainly depend on direct interpersonal communication to give the information effectively to the staff. Staff meetings (Mean = 3.09, SD = 0.77) is the next medium of communication while writing of circulars and memos (Mean = 2.98, SD = 0.84) and notice boards (Mean = 2.97, SD = 0.82) also show high-level of usage. This implies that most of the principals rely on formal and print-based communication channels. The use of telephone calls and SMS had the lowest mean score among the items (Mean = 2.75, SD = 0.95). It can be inferred that principals still prefer to adopt traditional means of communication.

Research Question 2

What is the level of awareness of Artificial Intelligence integration in principals' communication practices in public secondary schools in Osun State?

Table 2: The Awareness of AI Integration in Principals' Communication Practices (N = 256)

S/N	Items	VH	H	L	VL	Mean	SD	Decision
1	Awareness of AI tools for school communication	83	91	55	27	2.91	0.93	High
2	Awareness of AI-based messaging platforms	34	75	58	89	2.40	0.97	Low
3	Awareness of AI for feedback and reporting	40	67	66	83	2.39	1.00	Low
4	Awareness of AI-supported data communication	61	86	69	40	2.66	0.99	High
5	Awareness of AI benefits teachers' efficiency	72	90	60	34	2.79	0.95	High
Grand Mean						2.63	0.97	High

The level of awareness of Artificial Intelligence integration in principals' communication practices in public secondary schools in Osun State as shown in Table 2, reveals how much the public secondary school's principals in Osun State aware of the Artificial Intelligence (AI) integration in their communication practices. The high level of awareness drew out the major mean of 2.63 with a standard deviation of 0.97. This implies that, in general, the respondents are conscious of the significance and future of AI in improving school communication. Awareness of AI tools for school communication was at the high end with a mean score of (Mean = 2.91, SD = 0.93) which suggests that the majority of the respondents are acquainted with the idea of AI in communication in schools. Likewise, the awareness of AI-supported data communication (Mean = 2.66, SD = 0.99) and the awareness of the benefits of AI for teachers' efficiency (Mean = 2.79, SD = 0.95) were also rated high indicates the respondents recognized that AI could improve information management and hence make teachers' work more efficient. However, the awareness of the more specific and functional applications of AI was quite low. The awareness of AI-based messaging platforms (Mean = 2.40, SD = 0.97) and that of AI for feedback and reporting (Mean = 2.39, SD = 1.00) were both rated low which signifies that there is no much knowledge about the practical AI tools that help with automated communication and performance feedback. Although, the principals and the teachers have the idea and the advantages of AI but the low rating on their awareness of AI-based messaging platforms and AI for feedback and reporting indicates that their comprehension of the communication tools driven by AI is still not sufficient.

Research Question 3

To what extent are Artificial Intelligence tools integrated into principals' communication practices in public secondary schools in Osun State?

Table 3: Extent of Integration of AI Tools in Principals' Communication Practices (N = 256)

S/N	Items	VH	H	L	VL	Mean	SD	Decision
1	Use of AI tools for staff information dissemination	51	78	83	44	2.54	1.02	High
2	Use of AI for automated feedback to teachers	43	67	91	55	2.39	1.04	Low
3	Use of AI-based communication platforms	46	70	87	53	2.43	1.03	Low
4	Use of AI for monitoring and reporting	38	65	95	58	2.32	1.05	Low

5	Use of AI to enhance principal–teacher interaction	44	69	88	55	2.41	1.03	Low
Grand Mean						2.42	1.03	Low

The researchers went further to investigate into the extent of integration of AI tools in communication practices of school principals. Contrary to the high awareness reported earlier, the results reveal a low level of actual integration of AI tools, with a grand mean of 2.42 (SD = 1.03) as shown in Table 3. Among the items, staff information dissemination via AI tools marginally emerged as the high rated with the mean score of 2.54 (SD = 1.02) indicating limited and inconsistent usage. On the other hand, the use of AI in providing automated feedback to teachers (Mean = 2.39, SD = 1.04), AI-based communication platforms (Mean = 2.43, SD = 1.03), AI for monitoring and reporting (Mean = 2.32, SD = 1.05), and AI to enhance principal–teacher interaction (Mean = 2.41, SD = 1.03) were all assessed as low. It can therefore be inferred that, AI tools are more or less completely out of the picture when it comes to daily communication between school principals and teachers. The difference between high awareness and low integration reveals the existence of an awareness–integration gap. This could emanate from challenges such as limited or lack of infrastructure and lack of sufficient trained staff.

Research Question 4

What is the level of teachers' efficiency in public secondary schools in Osun State?

Table 4: Level of Teachers' Efficiency (N = 256)

S/N	Items	VH	H	L	VL	Mean	SD	Decision
1	Teachers complete assigned instructional tasks promptly	91	100	42	23	3.02	0.84	High
2	Teachers prepare lesson notes and instructional materials regularly	87	95	49	25	2.96	0.87	High
3	Teachers demonstrate punctuality and regular attendance	94	98	41	23	3.03	0.83	High
4	Teachers effectively manage classroom activities	83	103	47	23	2.96	0.85	High
5	Teachers respond promptly to administrative instructions	88	96	46	26	2.97	0.88	High
6	Teachers effectively collaborate with school management and colleagues	85	101	45	25	2.97	0.86	High
Grand Mean						2.99	0.86	High

The findings as shown in Table 4 revealed a grand mean score of 2.99, with a standard deviation of 0.86 on teachers' efficiency in public secondary schools in Osun State. This implies a relatively high level of teachers' efficiency in the sampled schools. In other words, teachers were generally effective in carrying out both instructional and administrative responsibilities. The result also showed that teachers' punctuality and regular attendance had the highest mean score (Mean = 3.03, SD = 0.83). This suggests that the teachers seemed committed to school activities and their instructional duties, not just showing up, but also doing it consistently. Likewise, prompt completion of instructional tasks recorded a high mean score (Mean = 3.02, SD = 0.84), meaning assigned duties were handled efficiently within the expected time. In addition, preparation of lesson notes and teaching materials (Mean = 2.96, SD = 0.87) was rated high, following the same pattern of effective classroom management (Mean = 2.96, SD = 0.85). Teachers showed prompt response to administrative instructions (Mean = 2.97, SD = 0.88), and collaborated with school management and colleagues (Mean = 2.97, SD = 0.86). This generally indicates that teachers in public secondary schools in Osun State exhibited a relatively high level of professional efficiency.

Research Question 5

What is the association between principals' AI-supported communication practices and teachers' efficiency in public secondary schools in Osun State?

Table 5: Regression Analysis

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate	F-value	Sig. (p-value)
1	0.652	0.425	0.422	0.431	186.52	0.000*

*Significant at $p < 0.05$

Table 6: Regression Coefficients

Predictor Variable	B	Std. Error	Beta (β)	t-value	Sig. (p-value)
AI-supported Communication Skills	0.611	0.045	0.652	13.65	0.000*

*Significant at $p < 0.05$

Tables 5 and 6 present the results of the regression analysis examining the association between principals' AI-supported communication practices and teachers' efficiency in public secondary schools in Osun State. According to Table 5, the correlation coefficient ($R = 0.652$) reveals association between principals' AI-supported communication skills and teachers' efficiency. While the coefficient of determination ($R^2 = 0.425$) demonstrates that 42.5% of the variance in teachers' efficiency is attributable to principals' AI-supported communication skills. The remaining 57.5% might be attributed to other factors not included in the study. The adjusted R^2 value (0.422) provides further evidence of the model's legitimacy, reliability and consistency.

Table 6 further indicates that the AI-supported communication of the principal has a positive association with the efficiency of the teacher ($B = 0.611$, $\beta = 0.652$, $t = 13.65$, $p = 0.000$). This indicates that higher levels of principals' AI-supported communication practices were associated with higher levels of teachers' efficiency among the sampled respondents. The beta coefficient further substantiates that AI-supported communication practices are a powerful predictor of teachers' efficiency. Although, the overall level of AI integration was low, differences in the extent of AI-supported communication practices across schools were sufficient to produce a statistically significant association with teachers' efficiency. This suggests that limited use of AI-supported communication tools may be associated with more effective information sharing, feedback delivery, and administrative coordination, which in turn relate to higher levels of teachers' efficiency.

Discussion

This section explains the main findings of the research and relates them with the research objectives, research questions, hypothesis, and the current empirical and theoretical literature on Artificial Intelligence (AI), the communication practices of principals, and the efficiency of teachers in public secondary schools. The findings showed that the principals of public secondary schools in Osun State extensively used traditional communication methods such as face-to-face interaction, staff meetings, circulars, official memos, notice boards, and telephone communication/SMS. The high grand mean score demonstrates that communication via the conventional methods is still the primary way of interaction between principals and teachers. This finding is consistent with the study of Dairo et al. (2024), which discovered that the methods of communication in school leadership are still mainly manual and interpersonal with limited digital infrastructure. The personal communication and the staff meetings were the most methods of communication in school leadership. This connotes that the principals perceived the direct communication as a need for clarity, the control of the process, and good relationships. From the perspective of leadership, this is in line with Fullan et al. (2024) who argued that face-to-face communication plays the key role in trust and collaboration within the school environment. While these traditional practices are good for normal administration, their predominance also indicates slow move to technology-enhanced communication, which might restrict efficiency, speed and teaching quality in modern school management. This implies that Nigerian public secondary schools are still in early stage of the digital leadership transformation.

According to the findings, the awareness level about AI integration in communication practices of principals was found to be high, but different applications. The respondents recognized very well the general AI tools, AI-based data communication, and the benefits of AI for teachers' efficiency. This indicates an increasing familiarity with the AI discourse and the acknowledgment of its potential value in the administration of schools. This result supports the findings of Obano and Osagie (2025) that reported an increase in AI awareness among school leaders, due to the global digitalization trends and policy discussions. The outcome also conforms to the Diffusion of Innovation Theory, which states that awareness is a precondition for the adoption of new technologies (Rogers et al., 2014). Nonetheless, the awareness of certain AI applications, like AI-driven messaging platforms and automatic feedback/reporting systems, was limited. This disparity points out that awareness is mostly theoretical rather than practical. Teachers and principals might perceive AI as a concept but do not have adequate knowledge of how specific AI tools operate in communication between schools and among the stakeholders. The same pattern was reported by Cai (2023) who said that lack of hands-on experience leads to a superficial understanding of AI capabilities. This finding calls for professional development that is specific and goes beyond just making them aware of the technology to practical demonstrations and skills acquisition.

The research despite the high level of awareness, reported that AI tools were not actually integrated to a large extent in the communication practices of principals. Except for the use of AI for disseminating staff information, the majority of AI-related practices such as automated feedback, AI-based platforms, and monitoring, and reporting with interaction, were poorly integrated. This finding discloses that being aware of something does not necessarily lead to its adoption. It also supports previous studies, which revealed deficits in infrastructure, limited digital skills,

inadequate training, and lack of supportive policies as the main obstacles to the integration of AI in schools ((Almaiah et al., 2022; Obano & Osagie, 2025).

The study further showed that high level of teachers' efficiency in the sampled schools implies that teachers were generally effective in carrying out their instructional and administrative responsibilities. This study corroborate with findings of Olowo (2023) which stated that teachers in south-western Nigeria were highly efficient on their duty.

The regression analysis indicated that there was a statistically significant association between principals' AI-supported communication practices and teachers' efficiency. This suggests that principals' AI-supported communication practices significantly predict variations in teachers' efficiency based on respondents' perceptions. This finding corroborates the results of evidence-based studies that indicated that technology-enhanced leadership results in better administrative efficiency, more instructional support and hence, greater teacher productivity (Adams & Thompson, 2025; Zeng et al., 2025). AI-supported communication facilitates the timely sharing of information, setting of clearer expectations, getting quicker feedback, and making decisions based on data, all these factors lead to better teacher performance. The result further affirms the Digital Leadership Theory which states that leaders who are good, at using digital tools effectively, will create an environment where teachers are efficient and innovative (Alghamdi, 2024).

Although the overall level of AI integration in principals' communication practices was low, the regression analysis revealed a strong and statistically significant association with teachers' efficiency. This apparent contradiction may be explained in several ways. First, variations in the degree of AI-supported communication practices across schools, even at generally low levels, may have been sufficient to account for observable differences in teachers' efficiency. Second, the measures used in this study were based on teachers' perceptions and self-reports, which may reflect subjective evaluations of principals' communication effectiveness rather than objective evidence of AI use. Third, because both the predictor and outcome variables were collected from the same respondents using the same instrument, the observed association may partly reflect shared-method bias, which can inflate relationships between variables. Furthermore, the AI-supported communication construct may represent broader digital leadership skills, communication responsiveness, and innovation readiness rather than direct or extensive AI implementation. Therefore, the strong association should be interpreted cautiously as reflecting perceived communication quality and school-level variation, rather than direct effects of AI integration.

Conclusion

The study concluded that traditional communication practices remain dominant among principals in public secondary schools in Osun State. Although respondents demonstrated relatively high awareness of AI integration, the actual use of AI-supported communication tools remained low, suggesting an awareness–practice gap. The findings further revealed that teachers' efficiency was relatively high and that principals' AI-supported communication practices were significantly associated with teachers' efficiency. However, these findings were based on teachers' self-reported perceptions obtained through a cross-sectional survey design. Consequently, the results should be interpreted as associative rather than causal, as the study does not establish cause-and-effect relationships. Nonetheless, the findings provide empirical evidence that greater integration of AI-supported communication practices may relate to improved administrative communication and teachers' work efficiency when supported by adequate infrastructure, professional training, and institutional policy frameworks.. As a result, the study made the following recommendations:

1. Training, workshops, and seminars for the purpose of enhancing the digital leadership and AI-related communication skills of school principals should be organized regularly by the Osun State Ministry of Education. The emphasis of these events should be on combining AI tools for school communication, feedback, monitoring, and reporting with their practical applications.
2. The government and other relevant stakeholders should jointly put money into the enhancement of digital infrastructure in the public secondary schools, such as the availability of internet, electricity, and digital devices. Also, there should be a provision for strong technical support systems which will be given to AI tools users to motivate them to keep using those tools.
3. It is necessary to create and provide clear policy frameworks and guidelines that will allow the ethical and effective use of AI in school leadership and communication. Policies like these should set the rules for the usage of data, privacy, accountability, and responsible AI in the education sector.

4. The introduction of continuous professional development programmes will lead to higher teachers' AI literacy and more teachers ready to work with the AI-supported communication. This will lead to widespread acceptance, less resistance to change, and more collaboration between principals and teachers.
5. Principals should employ a communication strategy that is balanced, and at the same time, focuses on AI-supported tools with the usual face-to-face interactions. This will allow the human attributes of leadership like understanding and trust to remain while the AI technologies' efficiency and responsiveness are being enjoyed.
6. The AI-supported communications initiatives should be piloted in some selected public secondary schools in Osun State. The experience gained from these pilots can be used to plan and support the wider implementation and scaling of the initiative all over the state.

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