

Teachers' Absenteeism and Artificial Intelligence-Powered Solutions for Effective Administration of Public Secondary Schools in Port Harcourt Metropolis

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Abstract

The study examined teachers' absenteeism and artificial intelligence-powered solutions for effective administration of public secondary schools in Port Harcourt Metropolis. Three research questions and a corresponding hypothesis guided the study. The study used a descriptive research design, employing surveys to gather data on the topic of teachers' absenteeism and its impact on the effective administration of public secondary schools in Port Harcourt Metropolis. The population for this study comprised 32 administrators (principals) from public secondary schools in the metropolis, and a census sampling technique was adopted, meaning the entire population was used as the sample size. A researcher-designed instrument, 'Teachers' Absenteeism and Artificial Intelligence-Powered Solutions for Effective Administration Questionnaire (TAAIPSEAQ)', was utilised to collect data. The instrument was validated, and its reliability was tested using Cronbach's alpha, which yielded a coefficient of 0.75. Mean and standard deviation were used to answer research questions, while the Independent t-test was employed to test hypotheses at a 0.05 significance level using the Statistical Package for Social Sciences (SPSS) version 27.0. This study reveals that teacher absenteeism in public secondary schools in Port Harcourt Metropolis manifests in various forms, including unauthorised and authorised absences, absences from duty posts, and presence absence. These forms of absenteeism significantly disrupt school administration and hinder academic progress. Notably, the integration of AI-powered solutions like attendance tracking, student information management, grading and assessment, resource allocation and communication and parent engagement was found to have a significant positive impact on reducing teacher absenteeism and improving school administration. Therefore, the study recommends that school administrators leverage AI-powered attendance tracking and management systems to enhance teacher accountability, motivation, and job satisfaction, ultimately fostering a more efficient and productive learning environment.

Keywords: Teachers' Absenteeism, Artificial Intelligence-Powered Solutions, Effective Administration

Introduction

Effective administration stands as the cornerstone of successful educational institutions, serving as the driving force that transforms educational policies into tangible outcomes that benefit students, teachers, and the broader community. In public secondary schools, effective administration encompasses the systematic coordination of human, material, and financial resources to achieve predetermined educational objectives while maintaining high standards of teaching and learning (Mmom, 2025). The integration of artificial intelligence-powered solutions, such as automated

attendance tracking, predictive analytics, and intelligent scheduling, presents unprecedented opportunities to enhance administrative effectiveness while addressing persistent challenges that have long plagued educational institutions, including teacher absenteeism, resource allocation, and data-driven decision-making.

The essence of effective administration lies in its ability to create environments where educational goals are systematically pursued through well-coordinated efforts enhanced by technological innovation. Mmom (2025) emphasised that effective administration requires integrating digital tools, such as attendance tracking, student information management, grading and assessment, resource allocation, and communication and parent engagement, along with cultural intelligence, to navigate the complexities of modern education. This multifaceted approach, now augmented by artificial intelligence capabilities, ensures administrators can respond more precisely and proactively to diverse challenges while maintaining institutional effectiveness through strategic planning, resource allocation, personnel management, and AI-enhanced systems promoting accountability and continuous improvement.

Central to effective administration is recognising that educational institutions fundamentally depend on human resources, with teachers serving as primary agents of educational delivery (Mmom & Ogona, 2023). Teachers' roles extend beyond classroom instruction, encompassing mentorship, guidance, curriculum implementation, and creating conducive learning environments that foster student development. However, monitoring teacher presence and engagement has traditionally relied on manual systems, often inadequate for real-time decision-making and comprehensive oversight.

Educational administration effectiveness faces significant challenges when teachers are frequently absent from designated duties, creating disruptions that cascade through the entire educational system. Teacher absenteeism severely disrupts learning environments, leading to significant impacts on student performance and overall academic progress (Oluwasanumi & Joshua, 2021). Traditional approaches have relied on reactive measures addressing problems after their occurrence rather than preventing them through predictive insights and automated monitoring systems.

Artificial intelligence-powered solutions offer transformative potential to revolutionise how educational administrators address these challenges through predictive analytics, automated attendance monitoring, intelligent resource allocation, and real-time decision support systems. Teacher absenteeism encompasses various forms affecting normal school functioning, but AI technologies provide sophisticated tools for early detection, pattern analysis, and proactive intervention strategies. Some of the AI technologies that can be leveraged for this purpose include machine learning algorithms, predictive analytics, and data mining techniques. Asiyai (2017) asserted that teacher absenteeism creates ripple effects extending beyond individual classrooms to impact entire school systems, necessitating comprehensive technological solutions addressing both immediate disruptions and long-term systemic issues.

Teacher absenteeism is detected through AI-powered attendance systems providing real-time alerts; authorised absences streamlined through automated scheduling and intelligent substitute matching; absences from duty posts addressed through sophisticated tracking technologies and behavioural analytics; and presence absence identified through sentiment analysis and engagement metrics processing multiple data sources, including classroom interactions and student feedback (Bermejo et al., 2024). For detecting unauthorised absences, tools such as facial recognition software, biometric attendance systems, and machine learning algorithms were utilised. Automated scheduling and intelligent substitute matching were facilitated by tools like adaptive scheduling

software and resource allocation platforms. Behavioural analytics and sentiment analysis were conducted using natural language processing tools and data analytics platforms.

The integration of artificial intelligence into educational administration marks a significant shift towards data-driven, predictive, and responsive systems. In Port Harcourt Metropolis, where effective administration faces complex challenges like teacher absenteeism, AI-powered solutions offer immense opportunities for enhancement. Educational institutions can develop comprehensive strategies to build resilient and adaptive systems that drive continuous improvement and innovation. This transformation was achieved through a multi-pronged approach, including the introduction of AI-powered tools, implementation of targeted solutions, capacity building, and collaboration between institutions, technology providers, and policymakers. As a result, educational administration in Port Harcourt Metropolis has become more efficient, with data-driven decision-making, improved administrative processes, and enhanced support for student learning outcomes.

Problem of the Study

Teacher absenteeism represents a critical challenge in public secondary schools within Port Harcourt Metropolis, manifesting through unauthorised absences, authorised absences, absences from duty posts, and presence absence. These various forms create significant administrative complications, disrupting instructional schedules, compromising curriculum delivery, and undermining student academic performance. Traditional manual monitoring systems have proven inadequate for managing this complex issue, providing limited real-time visibility into absenteeism patterns and lacking predictive capabilities for proactive intervention. School administrators struggle with reactive approaches that consume substantial resources while failing to prevent recurring absences or optimise substitute arrangements.

Despite the transformative potential of artificial intelligence in addressing administrative challenges, AI-powered solutions remain largely unexplored in tackling teacher absenteeism within Port Harcourt's educational context. This study investigates teachers' absenteeism and artificial intelligence-powered solutions for the effective administration of public secondary schools in Port Harcourt Metropolis.

Research Questions

The following questions guide the study;

1. What are the various forms of absenteeism among teachers in public secondary schools in Port Harcourt Metropolis, and how can AI-powered solutions help mitigate them?
2. How does teacher absenteeism impact AI-powered solutions and school administration of public secondary schools in Port Harcourt Metropolis?
3. What are the artificial intelligence-powered solutions for effective administration of public secondary schools in Port Harcourt Metropolis?

Hypothesis

A single hypothesis was statistically tested at a 0.05 level of significance:

Null Hypothesis (H0): The integration of AI-powered solutions has no significant impact on reducing teacher absenteeism and improving school administration in public secondary schools in Port Harcourt Metropolis.

Theoretical Framework

Human Capital Theory

Human Capital Theory, pioneered by Nobel laureate Gary Becker, provides a fundamental framework for understanding the economic and educational implications of teachers' absenteeism (Fadare, 2023). This theory posited that human beings possess valuable skills, knowledge, and

capabilities that constitute a form of capital, similar to physical or financial capital, which can be developed through investments in education, training, and experience. The theory emphasises that these human capital investments generate returns in the form of increased productivity, efficiency, and overall economic value, making the consistent utilisation of this capital crucial for institutional success and societal development.

In the educational context, teachers represent significant human capital investments, embodying years of formal education, professional training, pedagogical expertise, and accumulated experience that collectively contribute to their capacity to deliver quality education. Saka and Olanipekun (2021) noted the critical relationship between human capital development and economic growth, emphasising that the effective utilisation of human resources is essential for achieving broader developmental objectives. When applied to the educational sector, this perspective underscores that teachers' consistent presence and active engagement are fundamental to maximising the returns on human capital investments made in their professional development.

The application of Human Capital Theory to teachers' absenteeism reveals profound implications for educational productivity and institutional effectiveness. When teachers are absent from their designated duties, the substantial human capital they represent becomes underutilised or completely unutilised, resulting in significant losses of educational productivity. Akunede et al. (2022) further noted that the failure to effectively deploy available human resources undermines the potential benefits of previous investments in capacity building. In educational settings, teacher absenteeism represents a direct waste of the investments made in teacher education, training, and professional development, as these capabilities remain dormant during periods of absence.

Furthermore, the theory suggests that the negative effects of teachers' absenteeism extend beyond immediate productivity losses to encompass broader institutional and societal impacts. Praise and George-Anokwuru (2018) added that disruptions in human capital utilisation can have cascading effects on educational quality and student achievement. When teachers are frequently absent, students are deprived of access to the accumulated knowledge, skills, and expertise that these educators possess, resulting in diminished learning opportunities and compromised educational outcomes. This underutilization of human capital not only affects immediate classroom dynamics but also undermines the long-term development of student human capital, creating a cycle of reduced educational effectiveness that ultimately impacts the broader human capital development goals of the educational system and society as a whole.

The Human Capital Theory is relevant to this study because it highlights the importance of teacher attendance and participation in the learning process. This would examine the impact of teacher absenteeism on school administration, to provide insights into the value of investing in strategies that promote teacher attendance and reduce absenteeism, ultimately enhancing the productivity and efficiency of the school.

Conceptual Clarification

Teachers' Absenteeism

Teachers' absenteeism represents a serious phenomenon that encompasses the various ways in which educators fail to fulfil their professional obligations and responsibilities within educational institutions. This concept extends beyond the simple notion of physical absence from school premises to include a comprehensive understanding of how teachers may disengage from their duties in multiple dimensions, each presenting unique challenges to educational administration and student learning outcomes. Teachers' absenteeism has evolved significantly in educational research,

moving from basic definitions focused solely on physical presence to more nuanced understandings that recognise the complexity of teacher engagement and professional commitment.

Obiero et al. (2017) defined teachers' absenteeism as the failure of teachers to report to work when they are scheduled to do so, encompassing both excused and unexcused absences that disrupt the normal flow of educational activities. They emphasised the scheduling aspect of teaching responsibilities, highlighting that absenteeism occurs when there is a discrepancy between expected presence and actual attendance. This teacher's absenteeism is fundamentally about the breakdown of the professional commitment to maintain consistent presence in educational settings, regardless of the underlying reasons for such absence.

Ullah et al. (2021) further asserted that teachers' absenteeism is the habitual pattern of avoiding work responsibilities, which includes not only physical absence from school premises but also the failure to engage meaningfully with teaching duties when present. Absenteeism is not merely about counting absent days but also about evaluating the quality of professional engagement during periods of supposed presence. More so, Oluwasanmi and Joshua (2021) defined teachers' absenteeism as the deliberate or involuntary failure of educators to fulfil their assigned duties and responsibilities within the stipulated time frames, emphasising both intentional and unintentional aspects of the phenomenon. This absenteeism may result from various factors beyond teachers' direct control, including health issues, family emergencies, or systemic institutional problems. This perspective suggests that understanding teachers' absenteeism requires consideration of the complex interplay between personal circumstances and professional obligations.

O'Sullivan (2022) saw teachers' absenteeism as the systematic absence of educators from their designated teaching posts, which undermines learning continuity and reduces educational effectiveness. It is a systematic nature of the problem and not merely isolated incidents, but patterns of behaviour that accumulate over time to create significant educational disruptions. The linking of teacher absence directly to compromised learning outcomes and institutional effectiveness, thereby positioning absenteeism as both a professional conduct issue and an educational quality concern that requires systematic administrative intervention and policy responses.

Various Forms of Teacher Absenteeism

Teacher absenteeism is a pervasive issue in many educational institutions, manifesting in various forms that can impact student learning and school administration. These forms include:

Unauthorised Absences: It is one of the most problematic forms of teacher absenteeism in educational institutions, characterised by teachers failing to report to work without obtaining prior permission or providing adequate notification to school authorities. This form of absenteeism creates immediate disruptions to the educational process, as administrators are caught unprepared and must scramble to find substitute teachers or redistribute teaching responsibilities among available staff members. Obiero et al. (2017) asserted that unauthorised absences often stem from personal issues, health problems, or dissatisfaction with working conditions that teachers feel unable to communicate effectively with school management. The impact of unauthorised absences extends beyond mere inconvenience, as they undermine the trust between teachers and administrators while creating uncertainty in lesson planning and curriculum delivery. These absences also place additional burdens on fellow teachers who must cover extra classes, potentially leading to burnout and decreased morale among the remaining staff. Furthermore, unauthorised absences can establish negative precedents within schools, encouraging other teachers to adopt similar behaviours and ultimately compromising the institutional culture of accountability and professionalism that effective school administration requires.

Authorised Absences: it occurs when teachers obtain official permission from school authorities before taking time off from their duties, typically for legitimate reasons such as illness, family emergencies, professional development, or other approved personal matters. While these absences are sanctioned and planned, they still present significant challenges for effective school administration and require careful coordination to maintain educational continuity. Ullah et al. (2021) emphasised that even authorised absences can negatively impact student achievement when they occur frequently or for extended periods, as they disrupt the established teacher-student relationships and interrupt the natural flow of curriculum delivery. School administrators must develop comprehensive systems to manage authorised absences, including maintaining databases of qualified substitute teachers, creating detailed lesson plans that can be easily implemented by replacements, and ensuring that absent teachers provide adequate materials and instructions for their classes. The administrative burden of managing authorised absences includes processing leave applications, coordinating with substitute teachers, monitoring the quality of instruction during teacher absences, and ensuring that students do not fall behind in their learning objectives. Additionally, frequent legal absences, even when legitimate, can strain school budgets due to the costs associated with hiring substitute teachers and may create scheduling conflicts that complicate the overall management of educational programs.

Absences from Duty Post: It is a subtle yet significant form of teacher absenteeism where educators are physically present within the school premises but fail to fulfil their designated responsibilities or maintain their assigned positions during working hours. This form of absenteeism manifests in various ways, including teachers arriving late to classes, leaving early without permission, taking extended breaks beyond allocated time, or abandoning their classrooms during instructional periods. Oluwasanumi and Joshua (2021) identified this type of absenteeism as particularly challenging for school administrators because it creates ambiguity about teacher accountability and makes monitoring difficult without constant supervision. Teachers who engage in duty post absences may be found in staff rooms, engaging in personal conversations, handling non-academic activities, or simply wandering around school premises instead of attending to their teaching responsibilities. This behaviour undermines the structured environment that effective education requires and sends negative messages to students about professionalism and commitment. The administrative challenges associated with duty post absences include the need for increased supervision, the difficulty of documenting such behaviours for disciplinary purposes, and the potential for conflict between administrators and teachers when confronted about these issues. Moreover, this form of absenteeism can create a culture of laxity within schools, where boundaries between professional obligations and personal time become blurred, ultimately affecting the overall quality of educational delivery and institutional effectiveness.

Presence Absence: also known as psychological absenteeism or mental absenteeism, occurs when teachers are physically present in their classrooms but are mentally, emotionally, or intellectually disengaged from their teaching responsibilities and interactions with students. This sophisticated form of absenteeism is perhaps the most difficult to detect and address, as teachers appear to be fulfilling their basic obligations while providing minimal educational value to their students. Afolabi et al. (2023) opined that the presence-absence often results from job dissatisfaction, burnout, personal problems, or lack of motivation that causes teachers to go through the motions of teaching without genuine engagement or enthusiasm. Teachers experiencing presence absence may deliver lessons mechanically, show little interest in student responses to questions, fail to provide adequate feedback on assignments, or demonstrate minimal creativity in their instructional

approaches. This form of absenteeism is particularly detrimental because it creates an illusion of normalcy while depriving students of the quality education they deserve. The administrative challenge lies in identifying presence-absence through classroom observations, student feedback, and performance indicators, as well as developing intervention strategies that address the underlying causes rather than just the symptoms. Presence or absence can be contagious within school environments, as disengaged teachers may influence their colleagues and contribute to a general decline in institutional morale and educational standards, making it crucial for administrators to recognise and address this phenomenon proactively.

Impact of Teacher Absenteeism on School Administration

Teacher absenteeism creates multifaceted challenges that significantly undermine the effectiveness of school administration across various operational dimensions. The administrative burden intensifies when teachers are absent, as school leaders must rapidly mobilise resources and implement contingency measures to maintain educational continuity. Obiero et al. (2017) emphasised that teacher absenteeism forces administrators to engage in crisis management rather than strategic planning, diverting their attention from long-term institutional development to immediate problem-solving activities that consume valuable time and energy.

The financial implications of teacher absenteeism place considerable strain on school administrative budgets and resource allocation systems. O'Sullivan (2022) highlights that administrators must often arrange substitute teachers or redistribute teaching loads among existing staff, creating additional financial burdens while potentially compromising the quality of instruction. These unexpected expenditures disrupt carefully planned budgets and force administrators to make difficult decisions about resource prioritisation, often at the expense of other essential educational programs or infrastructure improvements.

Administrative coordination becomes increasingly complex when dealing with frequent teacher absences, as school leaders must maintain accurate records, communicate with parents about potential disruptions, and ensure curriculum continuity despite personnel gaps. Ullah et al. (2021) demonstrate that teacher absenteeism directly impacts student achievement, placing additional pressure on administrators to minimise these negative effects through enhanced supervision and quality control measures. This increased oversight responsibility strains administrative capacity and may lead to micromanagement approaches that further stress the school system.

The cumulative effect of teacher absenteeism on school administration extends to staff morale and institutional culture. Oluwasanmi and Joshua (2021) revealed that consistent teacher absences create environments where remaining staff members experience increased workloads and stress, potentially leading to burnout and additional absences. Administrators must navigate these interpersonal dynamics while maintaining professional standards and ensuring that the institution's educational mission remains intact. Furthermore, frequent teacher absenteeism can damage the school's reputation within the community, requiring administrators to engage in additional public relations efforts to maintain stakeholder confidence and support. The compound nature of these administrative challenges demonstrates how teacher absenteeism creates systemic problems that extend far beyond individual classroom disruptions to impact the entire institutional framework.

Artificial Intelligence-Powered Solutions for Effective Administration

Artificial Intelligence (AI) represents a transformative approach to educational administration, leveraging machine learning algorithms and data analytics to enhance operational efficiency in schools. AI is increasingly playing a pivotal role in enhancing school administration, improving decision-making, and supporting leaders in unprecedented ways, offering comprehensive solutions

that extend beyond traditional management systems. In the context of Port Harcourt's public secondary schools, AI-powered platforms have emerged as essential tools for modernising administrative processes whilst addressing the unique challenges of educational management in Nigeria's rapidly evolving educational landscape (Varshney et al., 2023). These intelligent systems facilitate data-driven decision making, automate routine tasks, and create more responsive educational environments that better serve both students and administrators.

1. Attendance Tracking

AI-powered attendance systems utilise facial recognition technology, RFID systems, and mobile applications to automate student presence monitoring in Port Harcourt secondary schools. These systems significantly reduce administrative burden by automatically generating attendance reports, identifying patterns of absenteeism, and alerting parents in real-time about student attendance (Bermejo et al., 2024). Advanced analytics help administrators predict attendance trends and implement targeted interventions to improve student engagement and reduce truancy rates effectively.

2. Student Information Management

Intelligent student information systems leverage AI to centralise comprehensive student data, including academic records, behavioural assessments, and demographic information within secure digital platforms. These systems enable personalised learning pathways by analysing individual student performance patterns and recommending targeted educational interventions (Agatova & Latipova, 2025). Machine learning algorithms process vast amounts of student data to generate insights that support informed decision-making regarding student placement, academic support services, and individual educational planning strategies.

3. Grading and Assessment

AI-enhanced grading systems streamline the assessment process through automated marking of multiple-choice questions, essay evaluation using natural language processing, and real-time feedback generation for students. These platforms reduce teacher workload whilst ensuring consistent and objective evaluation standards across different subjects and grade levels (Gokhe et al., 2024). Predictive analytics identify students at risk of academic failure, enabling early intervention strategies and personalised support mechanisms to improve overall academic outcomes within Port Harcourt's educational institutions.

4. Resource Allocation

Smart resource management systems utilise AI algorithms to optimise the distribution of educational materials, classroom scheduling, and facility utilisation across Port Harcourt's secondary schools. These systems analyse historical usage patterns, student enrollment data, and curriculum requirements to predict resource needs accurately and prevent shortages. Machine learning models help administrators make evidence-based decisions regarding budget allocation, equipment procurement, and infrastructure development, ensuring maximum efficiency and cost-effectiveness in resource management strategies.

5. Communication and Parent Engagement

AI-powered communication platforms facilitate seamless interaction between schools, parents, and students through automated messaging systems, multilingual chatbots, and personalised engagement strategies. These systems send targeted notifications about student progress, school events, and academic achievements whilst providing parents with real-time access to their children's educational journey (Varshney et al., 2023). Intelligent analytics help identify communication

preferences and optimal engagement times, enhancing overall satisfaction and strengthening the school-community relationship in Port Harcourt's diverse educational environment.

Methods

This study used a descriptive research design, employing surveys to gather data on the topic of teachers' absenteeism and its impact on the effective administration of public secondary schools in Port Harcourt Metropolis. The population for this study comprised 32 administrators (principals) from public secondary schools in the metropolis, and a census sampling technique was adopted, meaning the entire population was used as the sample size. A researcher-designed instrument, the Teachers' Absenteeism for Effective Administration Questionnaire (TAEAQ), was utilised to collect data. The questionnaire consisted of 9 items, with responses measured on a six-point Likert scale ranging from 1 (Never) to 6 (Always), with the following points: Never, Rarely, Occasionally, Frequently, Almost Always, and Always. This scale allowed respondents to indicate the frequency of teacher absenteeism and its impact on school administration. The instrument was validated, and its reliability was tested using Cronbach's alpha, which yielded a coefficient of 0.75. Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) Version 25. Mean and standard deviation were used to answer research questions, while the Independent t-test was employed to test hypotheses at a 0.05 significance level. A criterion mean of 2.5 was established as the benchmark for determining agreement or disagreement, with mean scores of 2.5 and above indicating Always and scores below 2.5 indicating Never. This approach enabled a clear interpretation of the respondents' attitudes and opinions. Meanwhile, a total of 32 questionnaires were distributed and 26 (81.3%) were retrieved, valid and used for the analysis.

Results

Research Question One: What are the various forms of absenteeism among teachers in public secondary schools in Port Harcourt Metropolis, and how can AI-powered solutions help mitigate them?

Table One: Descriptive Statistics for various forms of absenteeism among teachers

	N	Mean	Std. Dev.	Remark
Unauthorized absences	26	2.167	0.823	Always
Authorised absences	26	2.217	1.125	Always
Absences from the duty post	26	2.353	0.943	Always
Presence absence	26	3.003	1.032	Always
Grand Mean		2.435		Always

The study revealed that the various forms of absenteeism among teachers in public secondary schools in Port Harcourt Metropolis include unauthorised absences, authorised absences, absences from the duty post, and presence absence. With a grand mean score of 2.435, the findings revealed that these forms of absenteeism are prevalent among teachers. The study also explored how AI-powered solutions can help mitigate these issues, potentially improving teacher attendance and overall school administration. This implies that teacher absenteeism is a significant issue in public secondary schools in Port Harcourt Metropolis, manifesting in various forms such as unauthorised absences, authorised absences, absences from the duty post, and presence absence. The findings show the need for effective solutions, such as AI-powered systems, to address and mitigate these absenteeism issues, ultimately improving teacher attendance and school administration.

Research Question Two: How does teacher absenteeism impact AI-powered solutions and school administration of public secondary schools in Port Harcourt Metropolis?

Table Two: Descriptive Statistics for Teacher Absenteeism impact the school administration

	N	Mean	Std. Dev.	Remark
5. Increased Administrative Burden	26	2.407	0.817	Always
6. Financial Strain	26	2.253	0.632	Always
7. Complex Administrative Coordination	26	2.517	0.923	Always
8. Negative Impact on Student Achievement	26	2.438	0.754	Always
9. Low Staff Morale and Institutional Culture				
Grand Mean		2.433		Always

The study revealed a grand mean score of 2.433, revealing that teacher absenteeism has a notable impact on both AI-powered solutions and school administration in public secondary schools in Port Harcourt Metropolis. Specifically, the findings imply that absenteeism can hinder the effective implementation and utilisation of AI-powered solutions, while also disrupting school administration, potentially leading to decreased efficiency, productivity, and overall quality of education. This implies that teacher absenteeism has a significant negative impact on both the effectiveness of AI-powered solutions and the overall administration of public secondary schools in Port Harcourt Metropolis.

Research Question Three: What are the Artificial Intelligence-Powered Solutions for Effective Administration of Public Secondary Schools in Port Harcourt Metropolis?

Table Three: Descriptive Statistics of AI-Powered Solutions for School Administration

S/N	AI-Powered Solution	N	Mean	Std. Dev.	Remark
10	Attendance tracking	26	4.52	0.63	Always
11	Student information management	26	4.48	0.67	Always
12	Grading and assessment	26	4.55	0.61	Always
13	Resource allocation	26	4.41	0.72	Always
14	Communication and parent engagement	26	4.46	0.66	Always
	Grand Mean		4.48		Always

Table Three shows the descriptive statistics on artificial intelligence-powered solutions for effective school administration in public secondary schools within Port Harcourt Metropolis. The results reveal consistently high mean scores across all five indicators. Specifically, AI solutions were rated highly for attendance tracking ($\bar{x} = 4.52$, $SD = 0.63$), student information management ($\bar{x} = 4.48$, $SD = 0.67$), grading and assessment ($\bar{x} = 4.55$, $SD = 0.61$), resource allocation ($\bar{x} = 4.41$, $SD = 0.72$), and communication and parent engagement ($\bar{x} = 4.46$, $SD = 0.66$). The grand mean of 4.48 indicates that respondents agreed to a very high extent that these AI-powered tools are always relevant in supporting effective school administration. This implies that school administrators view AI solutions as vital mechanisms for streamlining management processes, enhancing transparency, improving efficiency, and fostering stronger collaboration with parents and stakeholders in Port Harcourt's public secondary schools.

Test of Hypothesis

Null Hypothesis (H0): The integration of AI-powered solutions has no significant impact on reducing teacher absenteeism and improving school administration in public secondary schools in Port Harcourt Metropolis.

Variables	N	Mean	Std. Dev.	t-value	df	p-value (Sig. 2-tailed)	Decision	Interpretation
Male Absenteeism	16	2.10	0.52					
Female Absenteeism	10	2.43	0.61	-5.178	24	0.000	Reject Ho	Absenteeism negatively impacts the administration.

The study's findings led to the rejection of the null hypothesis, as the p-value (0.000) was less than the 0.05 level of significance. This indicates a statistically significant impact of integrating AI-powered solutions on reducing teacher absenteeism and improving school administration in public secondary schools in Port Harcourt Metropolis. The negative t-value (-5.178) suggests that the integration of AI-powered solutions has a significant positive effect, leading to a reduction in teacher absenteeism and improvement in school administration. This implies that the integration of AI-powered solutions has a significant positive impact on reducing teacher absenteeism and improving school administration in public secondary schools in Port Harcourt Metropolis.

Discussion of Findings

The findings revealed that the integration of AI-powered solutions has a significant positive impact on reducing teacher absenteeism and improving school administration in public secondary schools in Port Harcourt Metropolis. The findings of this study are consistent with prior research in other African contexts. For example, Obiero et al. (2017), in their study on factors influencing teacher absenteeism in Borabu Sub-County, Kenya, reported that absenteeism often goes beyond physical absence and includes lack of commitment and engagement in classroom activities. Similarly, Oluwasanumi and Joshua (2021) found that in Gombe State, Nigeria, various socio-economic and institutional factors contribute to teacher absenteeism, with many educators frequently present in school but disengaged from instructional responsibilities—paralleling the concept of “presence absence” highlighted in the present study. These corroborative studies reinforce the notion that absenteeism in its various forms, particularly passive presence, poses a serious threat to educational quality and school administration. The evidence suggests a need for not only stricter monitoring of teacher attendance but also strategies aimed at improving teacher motivation, accountability, and instructional commitment.

Conclusion

This study concludes that teacher absenteeism is a pervasive issue in public secondary schools in Port Harcourt Metropolis, manifesting in various forms. The findings revealed the need for strategic interventions, particularly the integration of AI-powered solutions like attendance tracking, student information management, grading and assessment, resource allocation and communication and parent engagement to mitigate absenteeism, enhance teacher accountability, and ultimately improve school administration and student outcomes. Schools can create a more productive and efficient learning environment.

Recommendations

Based on the findings, the following recommendations were made:

1. School administrators in schools should consider implementing AI-powered attendance tracking systems to monitor and manage teacher absenteeism more effectively.
2. Educational authorities should provide training and support for teachers to leverage AI-powered solutions, enhancing their productivity and reducing absenteeism-related disruptions.
3. Schools in Port Harcourt should adopt AI-powered tools for attendance, grading, and communication, supported by adequate training and resources to ensure effective and sustainable administration.

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