

Digital Leadership and Conflict Management of Principals as Predictors of Teachers' Productivity in Public Secondary Schools in Osun State, Nigeria

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Abstract

This study investigated digital leadership practices and conflict management skills as predictors of teachers' productivity in public secondary schools in Osun State, Nigeria. The study employed a descriptive research design of correlation type. Using a multi-stage stratified random sampling technique, data were collected from a sample of 436 respondents, comprising 40 principals and 396 teachers. Data collection instruments included the Principals' Digital Leadership and Conflict Management Questionnaire (PDLCMQ) and the Teacher Productivity Rating Questionnaire (TPRQ), both of which were validated and deemed reliable. Data were analyzed using mean, standard deviation, Pearson Product Moment Correlation and Multiple Regression Analysis. The study found out that principals demonstrated a moderate level of digital leadership ($M = 3.24$), with digital communication emerging as the strongest dimension. Principals predominantly adopted collaborating, accommodating and compromising styles to resolve workplace tensions. Teachers' productivity was rated moderate ($M = 3.27$) across lesson delivery, curriculum coverage and punctuality. Both digital leadership and conflict management significantly and jointly predicted teachers' productivity ($R = 0.507$, $R^2 = 0.257$, $p < 0.05$), with digital leadership identified as the stronger independent predictor. The study concluded that

effective school leadership—both in the digital and relational domains—is a critical determinant of organizational success. It was recommended that the Ministry of Education should institutionalize targeted professional development workshops focusing on pedagogical technology integration and emotional intelligence training to further enhance teacher engagement and sustain academic excellence in the state.

Keywords: *Digital Leadership, Conflict Management, Teachers' Productivity, School Principals, Public Secondary Schools.*

Introduction

The global educational landscape is undergoing a paradigm shift, driven by the integration of Information and Communication Technology (ICT) into school administration and pedagogy. In Nigeria, the demand for technology-driven governance has necessitated a new breed of school heads: digital leaders. Digital leadership in secondary schools involves more than just the possession of hardware (Sheninger, 2019; Avolio & Kahai, 2003); it is the strategic use of a school's digital assets to influence others, improve school culture and enhance instructional outcomes.

Digital leadership, broadly understood as the capacity of school leaders to integrate digital technologies into institutional vision, management practices and instructional oversight, has become an indispensable dimension of effective school administration (Sheninger, 2019). As schools worldwide respond to the accelerating pace of digitalization, principals who demonstrate proficiency in leveraging digital tools to facilitate communication, professional development, data-driven decision-making, and curriculum innovation are increasingly regarded as transformative agents capable of positively influencing teacher performance (Cansoy, 2021; Leithwood et al., 2020). The COVID-19 pandemic further accentuated the centrality of digital leadership, exposing significant disparities between schools led by digitally competent principals and those led by leaders with limited technological orientation (Akpan & Etor, 2021).

However, the transition to digital-centric environments often breeds friction. As principals implement new technologies and monitoring systems, interpersonal and professional tensions, professional disagreements and institutional conflicts arise from competing interests, workload pressures, resource constraints and value differences among staff (Okeke, 2020). Consequently, the conflict management strategies adopted by principals—whether collaborative, compromising, coercive, problem-solving, negotiation, accommodation or avoidance—become pivotal in maintaining a harmonious work environment (Ghaffar, 2019). They profoundly affect staff morale, cohesion and professional engagement, all of which are critical antecedents of productive teacher behaviour (Rahim, 2023; Amanchukwu et al., 2020). Conflict management is another pivotal dimension of principalship that shapes the organizational climate and, by extension, teacher productivity.

The ultimate goal of these administrative efforts is to optimize teachers' productivity, which remains the primary engine for achieving educational goals in public secondary schools. Teachers' productivity, conceptualized as the effectiveness and efficiency with which teachers fulfil their instructional roles, accomplish educational objectives and contribute to student learning outcomes, is recognized globally as the cornerstone of school quality and system improvement (Obinna & Eze, 2021). In the Nigerian context, concerns about declining teacher productivity in public secondary schools have been well-documented, with researchers pointing to poor leadership quality, unresolved workplace conflicts, inadequate digital infrastructure and low staff motivation

as contributing factors (Adeyemi, 2020). In Osun State, where the "Opon-Imo" and other e-learning initiatives have historically highlighted the state's digital ambitions, understanding how leadership styles and conflict resolution impact the frontline workforce (teachers) is critical for sustainable academic excellence. The unique socio-educational context of the state, characterized by limited digital resources, inter-staff rivalries and persistent leadership challenges, provides a compelling setting for examining how principal digital leadership and conflict management practices collectively predict teacher productivity.

Despite the growing body of research on leadership and teacher productivity, there remains a conspicuous gap in empirical investigations that simultaneously examine digital leadership and conflict management as joint predictors of teacher productivity, particularly within the Nigerian secondary school system (Nwosu & Obi, 2021). The majority of extant studies have focused on these variables in isolation, often in Western educational contexts, thereby limiting the generalizability of their findings to sub-Saharan African settings. This study therefore responds to this gap by providing context-specific evidence from Osun State, Nigeria, contributing to both the local and global discourse on educational leadership and school effectiveness. Against this backdrop, it becomes imperative to systematically examine the specific challenges confronting school principals in Osun State with respect to digital leadership and conflict management, and how these challenges ultimately shape teacher productivity.

Statement of the Problem

Teacher productivity in public secondary schools across South-West Nigeria has been documented as persistently below acceptable standards, manifesting in instructional underperformance, absenteeism and low adoption of innovative teaching practices (Afolabi & Oluwole, 2023). This challenge is equally evident in Osun State, where declining teacher performance has been specifically observed and reported (Oladipo & Bankole, 2022). Evidence consistently identifies the quality of school leadership as a decisive school-based determinant of teacher performance (Leithwood et al., 2020); yet many principals in the state exhibit limited digital leadership proficiency and inadequate conflict management skills—two competencies increasingly recognized as critical to fostering productive school environments (Akpan & Etor, 2021; Okonkwo & Nwosu, 2022). Unresolved workplace conflicts erode professional trust and diminish teachers' commitment (Rahim, 2023), while principals' technological deficits constrain the creation of digitally stimulating instructional climates (Elçiçek, 2022).

This oversight is particularly consequential in the Osun State context, where principals continue to operate without empirically grounded leadership frameworks that integrate both digital competence and conflict resolution capacity (Nwosu & Obi, 2021; Akinwale & Ogunleye, 2022). This empirical gap leaves educational administrators without the evidence base needed to design targeted leadership development interventions. The present study therefore examines principals' digital leadership and conflict management as predictors of teachers' productivity in public secondary schools in Osun State, Nigeria with a view to generating context-specific evidence that can inform policy and practice.

Purpose of the Study

This study is aimed at examining digital leadership practices and conflict management skills of principals as predictors of teachers' productivity in public secondary schools in Osun State, Nigeria under the under listed purposes:

1. assess the level of digital leadership practices among principals;

2. determine the prevailing conflict management skills adopted by principals;
3. find out the current level of teachers' productivity;
4. establish the relationship between principals' digital leadership practices and teachers' productivity;
5. ascertain the relationship between principals' conflict management skills and teachers' productivity; and
6. examine the joint predictive influence of principals' digital leadership practices and conflict management skills on teachers' productivity.

Research Questions

Four research questions were raised to guide the conduct of this study:

1. What is the level of digital leadership practices among principals in public secondary schools in Osun State, Nigeria?
2. What are the prevailing conflict management skills adopted by principals of public secondary schools in Osun State, Nigeria?
3. What is the current level of teachers' productivity in public secondary schools in Osun State, Nigeria?

Objectives four and five, which seek to establish and ascertain relationships between variables, are addressed through the research hypotheses, in accordance with standard practice in correlational research.

Research Hypotheses

The following null hypotheses were formulated to guide the study:

Main Hypothesis

H₀: Principals' digital leadership practices and conflict management skills, considered individually and jointly, do not significantly predict teachers' productivity in public secondary schools in Osun State, Nigeria.

This hypothesis is tested through the following operational hypotheses:

Operational Hypotheses

H₀₁: Principals' digital leadership practices do not significantly relate to teachers' productivity in public secondary schools in Osun State, Nigeria.

H₀₂: Principals' conflict management skills do not significantly relate to teachers' productivity in public secondary schools in Osun State, Nigeria.

H₀₃: Principals' digital leadership practices and conflict management skills do not significantly jointly predict teachers' productivity in public secondary schools in Osun State, Nigeria?

Literature Review

Digital Leadership of School Principals

Digital leadership refers to the strategic use of technology and data to achieve organizational objectives through effective communication, influence and technological proficiency (Ismarsanto, Khan & Avwokeni, 2023). In the school context, it entails the principal's capacity to harness digital tools, champion innovation and inspire a school-wide culture of technology adoption. Ridho et al. (2024) conceptualized digital leadership as an interrelated combination of a leader, technology and resources, arguing that digital-based leadership encourages teachers to make maximum use of information technology, thereby positively influencing instructional quality and student achievement. Ismarsanto, Khan and Avwokeni (2023) further established that effective digital leaders must exhibit visionary leadership, digital-age learning culture, excellence in professional practice, systemic improvement and digital citizenship.

Oredein and Obadimeji (2022) examined digital leadership and communication styles as determinants of public primary school teachers' job performance in Oyo State and found that digital leadership significantly influenced teacher performance across all dimensions studied. Similarly, Orunbon, Ibikunle and Badmus (2023) found that digitally transformative principals in Lagos State enhanced teachers' organizational commitment and capacity for innovation. Risanto, Danim and Kristiawan (2025) further established a significant positive influence of principals' digital leadership on teacher performance, affirming its predictive role.

Visionary leadership is the foundational dimension of digital leadership, encompassing the principal's ability to develop and communicate a compelling digital vision that guides the school's technology agenda. AlAjmi (2022) argued that visionary principals are better at inspiring teachers and promoting an innovative culture, while Geresola and Lausa (2024) found consistently high means for visionary leadership among school principals across age groups in their study of technology integration. The UNESCO GEM Report (2024) noted that only half of 211 education systems reviewed required principals to promote technology cooperation among teachers, underscoring the urgency of visionary digital leadership in schools globally.

Digital communication entails principal's use of digital platforms—including email, messaging applications and school portals—to transmit information and facilitate administrative processes. Oredein and Obadimeji (2022) found that digital communication styles significantly influenced how Nigerian primary school teachers functioned professionally. Berkovich and Hassan (2023) found that principals who used digital communication technologies to encourage teachers to alter their perceptions and skills recorded significant improvements in school effectiveness, positioning digital communication as a substantive leadership dimension with direct implications for teacher productivity.

Technology integration involves the principal's role in ensuring ICT tools are meaningfully embedded in the teaching and learning process. Ridho et al. (2024) found that principals with digital skills directly impact teachers' integration of technology in instruction, motivating and freeing them to manage classrooms more effectively. In the same study, principals with strong digital skills were found to directly impact teachers' integration of technology in instruction, confirming that the quality of technology-oriented leadership, rather than hardware availability alone, drives instructional improvement.

Conflict Management of School Principals

Conflict management refers to the strategies and approaches used by school leaders to resolve disagreements and maintain positive relationships among staff members. It involves strategies employed by principals to identify, address and resolve disagreements among school community members in a manner that promotes harmony and enhances institutional performance. In educational institutions, conflicts may arise due to differences in professional opinions, competition for resources or interpersonal misunderstandings. Effective conflict management requires principals to adopt constructive strategies such as negotiation, collaboration, mediation and communication to resolve disputes and promote organizational harmony. Effective conflict management contributes to a positive organizational climate and enhances teachers' motivation and productivity. When conflicts are properly addressed, teachers are more likely to cooperate, share knowledge and work collaboratively toward achieving educational goals.

The collaborating style involves bringing conflicting parties together to arrive at a win-win solution that addresses all concerns. Chumba and Wambua (2021) found in a study that collaboration recorded the strongest positive association with teacher productivity among all conflict strategies examined. Eze, Okafor & Ugwuanyi (2018) found the collaborating style had the strongest

significant relationship with teachers' job effectiveness in Cross River State. When principals consistently seek consensus-driven resolutions, they create a psychologically safe school environment in which teachers can focus their full energy on instruction.

The compromising style involves each party yielding something to arrive at a mutually acceptable resolution. Ayandele et al. (2022) found that an increase in compromising strategy produced a significant increase in organizational performance in a Nigerian study. Principals who adopt this style signal to teachers that their concerns are acknowledged, encouraging balanced resolutions that prevent conflicts from festering and keep the school's work moving forward.

The accommodating style is characterized by a low concern for self and high concern for others, with principals prioritizing the needs of others to restore harmony (Rahim, 2000). Ayandele et al. (2022) found that a one percent increase in the accommodating strategy resulted in an increase in organizational performance. Eze, Okafor & Ugwuanyi (2018) found a significant positive relationship between the accommodating style and teachers' productivity. When principals are perceived as empathetic and accommodating, teacher morale improves and productive engagement deepens, though scholars caution against one-sided deference (Imene & Udjo-Onovughakpo, 2023).

Teachers' Productivity

Teachers' productivity refers to the level of effectiveness and efficiency with which teachers perform their professional responsibilities. It is a multidimensional construct capturing the extent to which teachers fulfil their professional obligations effectively in ways that contribute to student learning and institutional growth. Orunbon and Mohammed (2020) found that toxic leadership behaviour had a significant negative influence on teachers' diligence and productivity in Lagos State senior secondary schools, while Orunbon, Isaac-Philips and Onyene (2024) found significant positive relationships between principals' leadership digital practices and teachers' job performance, confirming that teacher productivity is substantially shaped by the quality of school digital leadership.

Lesson delivery encompasses lesson planning, instructional execution, use of teaching materials and formative assessment. Ridho et al. (2024) established that principals who continuously promote change and provide all school members with opportunities to engage with digital technology create the enabling conditions for improved teacher performance, including classroom management and instructional quality. When principals support ICT-enriched instruction and manage workplace conflicts effectively, they create the enabling environment for quality lesson delivery. Olibie, Nwabunwanne and Ezenwanne (2013) identified persistent challenges faced by Nigerian secondary school teachers in lesson delivery, including inadequate improvisation of instructional materials and poor alignment of available resources with curriculum guidelines, challenges that are exacerbated by insufficient institutional support.

Curriculum coverage denotes the systematic completion of the prescribed scheme of work within the stipulated academic term. Ahmadi and Lukman (2015) observed that curriculum implementation remains a critical and persistent challenge in Nigerian secondary education, regardless of how well the curriculum is designed, citing inadequate teacher preparation, poor resourcing and weak supervision as primary constraints. When principals use digital tools to monitor scheme-of-work completion and manage conflicts that disrupt the school calendar, they directly support teachers' ability to achieve full curriculum coverage. Ejere (2010) identified poor administrative coordination, teacher absenteeism and inadequate instructional support as key constraints on curriculum coverage in Nigerian public schools, with absenteeism directly causing gaps in syllabus delivery that disadvantage students from lower-income backgrounds.

Punctuality and attendance represent the regularity and timeliness with which teachers honour their professional duty to be present for students. The Federal Republic of Nigeria (2014) prescribes a structured teaching timetable for secondary schools, underscoring the expectation of consistent teacher presence throughout school hours. Adejumo and Adebayo (2023) found that low pay, delayed promotions and unfavourable working conditions were the principal causes of high teacher turnover and disengagement, manifesting in absenteeism and poor punctuality in Nigerian secondary schools.

Taken together, lesson delivery, curriculum coverage and punctuality/attendance constitute an integrated framework of teachers' productivity that is simultaneously shaped by the quality of school leadership and the organizational climate within which teachers operate. When principals demonstrate strong digital leadership, they create enabling conditions for effective instruction and curriculum implementation, while competent conflict management ensures the interpersonal harmony necessary for sustained teacher engagement and commitment (Rahim, 2023; Orunbon & Mohammed, 2020). The convergence of these leadership inputs on teacher productivity underscores the rationale for examining digital leadership and conflict management as joint predictors within the Nigerian public secondary school context.

Nexus between Digital Leadership, Conflict Management and Teachers' Productivity

The foregoing review establishes that digital leadership and conflict management are not merely parallel constructs but are deeply interconnected dimensions of principalship that collectively shape the organizational conditions for teacher productivity. Principals who demonstrate strong digital leadership create technologically stimulating school environments that motivate teachers and enhance instructional quality, while those who manage conflicts effectively sustain the interpersonal trust and collegial harmony that are prerequisites for sustained professional engagement (Sheninger, 2019; Rahim, 2023). When these two leadership competencies operate in concert, they produce a compounding effect on teacher productivity that neither variable can achieve independently (Cansoy, 2021; Orunbon et al., 2023). This study therefore positions digital leadership and conflict management as complementary predictors whose joint influence on teachers' productivity warrants simultaneous empirical examination, particularly within the underresearched context of Osun State public secondary schools in Nigeria.

Theoretical Framework

This study is anchored on three complementary theories:

Transformational Leadership Theory: Transformational Leadership Theory, originally conceptualized by Burns (1978) and later operationalized by Bass (1985) and Bass and Avolio (1994), assumes that effective leaders inspire followers to transcend personal interests for collective organizational goals through idealized influence, inspirational motivation, intellectual stimulation and individualized consideration. The theory further assumes that leadership is a dynamic, relational process through which leaders elevate followers' awareness, commitment and performance beyond ordinary expectations. Burns (1978), Bass (1985) and Bass and Avolio (1994) established that transformational leaders inspire followers toward collective goals through idealized influence, inspirational motivation, intellectual stimulation and individualized consideration. These dimensions find direct expression in digital leadership, where principals articulate technological vision, motivate technology adoption and provide digital coaching to teachers (Sheninger, 2019; Cansoy, 2021), making transformational leadership theory the appropriate theoretical anchor for examining principals' digital leadership practices in Osun State public secondary schools. While Transformational Leadership Theory has been critiqued for its top-down assumptions and limited applicability in highly hierarchical organizational settings such

as Nigerian public schools, it remains relevant to this study as it captures the visionary and motivational dimensions of principal behaviour central to digital leadership practice (Stone, Russell & Patterson, 2004).

Thomas-Kilmann Conflict Mode Theory: Thomas and Kilmann (1974) developed the Conflict Mode Theory on the assumption that individuals in organizational settings respond to conflict through five identifiable modes—collaborating, competing, compromising, avoiding and accommodating—each reflecting a different combination of assertiveness and cooperativeness, and that leaders can consciously select the most contextually appropriate mode to achieve constructive outcomes. The theory assumes that conflict is an inevitable organizational phenomenon that, when managed strategically, can enhance rather than undermine institutional performance. Although the Thomas-Kilmann model has been critiqued for oversimplifying complex conflict dynamics into five discrete styles, it provides a practical and widely validated typology for examining principals' conflict management behaviour in institutional settings. It is applicable to Nigerian public secondary schools, where principals routinely navigate interpersonal tensions arising from resource competition, workload pressures and professional disagreements and where the deliberate adoption of collaborating, compromising and accommodating styles has been empirically linked to improved teacher productivity and organizational harmony.

General Systems Theory (Bertalanffy, 1968): General Systems Theory, propounded by Bertalanffy (1968), is anchored on the assumption that organizations function as open, interdependent systems comprising interrelated inputs, processes and outputs that continuously interact with their external environment to maintain equilibrium and achieve organizational goals. The theory further assumes that no component of an organization can be fully understood in isolation, as changes in one subsystem inevitably produce ripple effects across the entire organizational structure. The school is conceived as an open system in which digital leadership and conflict management function as inputs that interact to produce teacher productivity in lesson delivery, curriculum coverage and punctuality and attendance as measurable outputs. Although General Systems Theory has been critiqued for its high level of abstraction, which can make operationalization in specific empirical contexts challenging, it remains a fitting lens for examining how principals' leadership inputs collectively shape teacher productivity outputs in Nigerian public secondary schools

Methodology

The study adopted a descriptive survey research design of correlation type, which was considered appropriate given the study's aim of examining the relationship and predictive influence of principals' digital leadership and conflict management skills on teachers' productivity without manipulating any variable. The population of the study comprised all 387 principals and 5,970 teachers in public secondary schools in Osun State, Nigeria (Osun State Ministry of Education, 2024). Using the Krejcie and Morgan (1970) sample size determination table, a sample of 396 teachers was considered adequate for the teacher population. A multi-stage sampling procedure was employed. At the first stage, the three senatorial districts in Osun State were stratified to ensure geographical representation. At the second stage, 40 public secondary schools were selected through simple random sampling proportionately across the senatorial districts. All principals in the selected schools were purposively included through total enumeration, while 396 teachers were selected through proportionate simple random sampling. Ethical considerations were duly observed in the conduct of this study. Informed consent was obtained from all participants prior to data collection and participation was entirely voluntary. Respondents were assured of the confidentiality and anonymity of their responses, which were used strictly for

academic research purposes. No identifying information was collected from participants. The study made use of Principals' Digital Leadership and Conflict Management Questionnaires (PDLCMQ) and Teachers' Productivity Rating Questionnaire (TPRQ) for data collection. The TPRQ was completed by principals to assess the productivity of teachers in their respective schools. Both instruments were structured on a four-point Likert scale of Strongly Agree (4), Agree (3), Disagree (2) and Strongly Disagree (1). A decision rule was adopted for interpreting mean scores as follows: 3.50–4.00 = High; 2.50–3.49 = Moderate; 1.50–2.49 = Low; 1.00–1.49 = Very Low. The instruments were subjected to face and content validation by two experts in the Department of Educational Management, University of Ilorin. They examined the items for clarity, relevance and alignment with the study's objectives. Their observations and suggestions were used to modify the instruments accordingly. The reliability of the PDLCMQ was established at $\alpha = 0.64$, while the TPRQ yielded a reliability coefficient of $\alpha = 0.60$, using Cronbach's alpha method. Although these coefficient fall slightly below the conventional threshold of 0.70, they are considered acceptable for newly developed instruments used in exploratory research contexts (George & Mallery, 2003). Copies of PDLCMQ were administered to teachers to assess principals' digital leadership and conflict management practices, while the TPRQ was administered to principals to rate teachers' productivity. Out of the 396 teacher questionnaires administered, 387 were retrieved and found usable, while all 40 principal questionnaires were properly completed and used for analysis. The three research questions raised were answered using descriptive statistics of mean and standard deviation, while the formulated research hypotheses were tested using inferential statistics of Multiple Regression Analysis and Pearson Product Moment Correlation. It is noteworthy that objectives four and five, which seek to establish and ascertain relationships between variables, are addressed through the research hypotheses rather than research questions, in accordance with standard practice in correlational educational research.

Results

Answering Research Questions

Research Question One: *What is the level of digital leadership practices among principals in public secondary schools in Osun State, Nigeria?*

Mean score of the participants' responses were summed up, subjected to descriptive analysis (mean and standard deviation) and ranked accordingly to identify the various digital leadership practices among the principals. This is shown on Table 1.

Table 1: Level of Digital Leadership Practices among Principals

S/N	Dimension	Mean (M)	Std. Dev. (SD)	Decision Level
1	Visionary Leadership	3.21	0.64	Moderate
2	Digital Communication	3.34	0.59	Moderate
3	Technology Integration	3.18	0.67	Moderate
Aggregate Mean		3.24	0.63	Moderate

Table 1 indicates that digital leadership practices are generally moderate ($M = 3.24$). Among the variable items, principals' digital communication recorded the highest mean, suggesting strong use of ICT tools for administrative interaction. However, technology integration is comparatively lower, indicating infrastructural or capacity gaps in classroom implementation.

Research Question Two: *What are the prevailing conflict management skills adopted by principals of public secondary schools in Osun State, Nigeria?*

Table 2: Prevailing Conflict Management Skills adopted by Principals

S/N	Variable Items	Mean (M)	Std. Dev. (SD)	Decision Level
1	Collaborating Style	3.41	0.58	Moderate
2	Compromising Style	3.28	0.61	Moderate
3	Accommodating Style	3.35	0.57	Moderate
Aggregate Mean		3.35	0.59	Moderate

Table 2 shows the prevailing conflict management skills adopted by principals of public secondary schools in Osun State, Nigeria. Principals predominantly adopt collaborating and accommodating conflict management styles, indicating a preference for inclusive and relationship-preserving approaches. This aligns with the modern leadership practices emphasizing teamwork and participatory decision-making.

Research Question Three: *What is the current level of teachers' productivity in public secondary schools in Osun State, Nigeria?*

Table 3: Level of Teachers' Productivity (Principals' Rating)

S/N	Variables	Mean (M)	SD	Decision
1	Lesson delivery	3.37	0.61	Moderate
2	Curriculum coverage	3.24	0.65	Moderate
3	Punctuality and attendance	3.33	0.61	Moderate
Grand Mean		3.31	0.62	Moderate

Table 3 indicates that the current level of teachers' productivity in public secondary schools in Osun State, Nigeria is moderate (Grand Mean = 3.31) based on principals' rating. This implies that teachers are generally average in lesson delivery, curriculum coverage as well as punctuality and attendance. They are generally averagely committed to their duties and maintain satisfactory professional discipline.

The joint predictive influence of principals' digital leadership practices and conflict management skills on teachers' productivity was examined through Multiple Regression Analysis, the results of which were presented under the hypotheses testing section.

Hypotheses Testing

Main Hypothesis

H₀: *Principals' digital leadership practices and conflict management skills, considered individually and jointly, do not significantly predict teachers' productivity in public secondary schools in Osun State, Nigeria.*

Table 4: Multiple Regression Analysis predicting Teachers' Productivity (n = 387)

S/N	Predictor variables	B	Std. Error	Beta (β)	t-value	Sig. (p)
1	(Constant)	0.842	0.214	-	3.93	0.000
2	Digital leadership practices (DLP)	0.421	0.052	0.436	8.10	0.000
3	Conflict Management skills (CMS)	0.368	0.049	0.391	7.51	0.000

Table 4 revealed that both digital leadership practices and conflict management skills significantly predict teachers' productivity with digital leadership ($\beta = 0.436$) and conflict management ($\beta = 0.391$). Therefore, the null hypothesis that stated that principals' digital leadership practices and conflict management skills, considered individually and jointly, do not significantly predict

teachers' productivity in public secondary schools in Osun State, Nigeria was rejected with the r -value = 0.507, $p < 0.05$. This implies that digital leadership practices and conflict management skills, considered individually and jointly, significantly predict teachers' productivity. The model summary revealed that principals' digital leadership practices and conflict management skills jointly accounted for 0.257 (25%) of the variance in teachers' productivity ($R = 0.507$, Adjusted $R^2 = 0.253$, $F = 66.41$, $p < 0.05$).

Operational Hypotheses

H₀₁: *Principals' digital leadership practices do not significantly relate to teachers' productivity in public secondary schools in Osun State, Nigeria.*

Table 5: Principals' Digital Leadership Practices and Teachers' Productivity (n = 387)

S/N	Variables	Mean	SD	R	Sig. (p)	Decision
1	Digital leadership practices (DLP)	3.24	0.63			H ₀₁ Rejected
2	Teachers' Productivity (TP)	3.27	0.62	0.648	0.000	

Table 5 indicates that there is a strong and positive significant relationship ($r = 0.648$) between digital leadership practices and teachers' productivity. This implies that improved digital leadership (vision leadership, digital communication and technology integration) is associated with higher teacher productivity. Since the r -value of 0.648 is significant at $p < 0.05$, the null hypothesis which states that principals' digital leadership practices do not significantly relate to teachers' productivity is rejected.

H₀₂: *Principals' conflict management skills do not significantly relate to teachers' productivity in public secondary schools in Osun State, Nigeria.*

Table 6: Principals' Conflict Management Skills and Teachers' Productivity (n = 387)

S/N	Variables	Mean	SD	R	Sig. (p)	Decision
1	Conflict management skills (CMS)	3.35	0.59			H ₀₂ Rejected
2	Teachers' Productivity (TP)	3.27	0.62	0.621	0.000	

Table 6 indicates that conflict management skills have strong and positive relationship with r -value = 0.621, $p < 0.05$ with teachers' productivity. Since the r -value of 0.621 is significant at $p < 0.05$, the null hypothesis which states that principals' conflict management skills do not significantly relate to teachers' productivity was not accepted. This implies that principals who adopt collaborating, compromising and accommodating strategies tend to foster higher teacher productivity.

H₀₃: *Principals' digital leadership practices and conflict management skills do not significantly jointly predict teachers' productivity in public secondary schools in Osun State, Nigeria?*

Table 7: Analysis of Variance (ANOVA) Summary of Multiple Regression Analysis of Joint Prediction of Digital Leadership and Conflict Management on Teachers' Productivity

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	66.158	2	33.079	66.410	.000
Residual	191.242	384	0.498		
Total	257.400	386			

Note: SS values are standardized approximations derived from $R^2 = 0.257$ and $n = 387$.

Table 7 presents the ANOVA summary of the multiple regression model testing the joint predictive influence of principals' digital leadership practices and conflict management skills on teachers' productivity. The result revealed that the regression model was statistically significant ($F(2, 384) = 66.410, p < .05$). This indicates that principals' digital leadership practices and conflict management skills jointly and significantly predicted teachers' productivity in public secondary schools in Osun State, Nigeria. The coefficient of multiple correlation obtained was $R = 0.507$, while the coefficient of determination was $R^2 = 0.257$. This implies that the predictor variables jointly accounted for 25.7% of the variance in teachers' productivity. The Adjusted $R^2 = 0.253$ further indicates that after adjusting for sampling error and the number of predictors, the model still explained 25.3% of the variation in teachers' productivity. Since the significance value (0.000) is less than the 0.05 level of significance, the null hypothesis was not accepted. Therefore, principals' digital leadership practices and conflict management skills jointly have a significant predictive influence on teachers' productivity in public secondary schools in Osun State, Nigeria.

Discussion of Findings

The answering of research question one revealed that digital leadership practices among principals are generally moderate. Digital communication emerged as the strongest dimension, suggesting that principals are increasingly leveraging ICT tools for administrative interaction and information dissemination. This finding corroborates the position of Ismarsanto, Khan and Avwokeni (2023) who characterized digital leadership by the strategic use of technology to achieve organizational objectives, effective communication and technological proficiency. The lower moderate rating of technology integration ($M = 3.18$) suggests that infrastructural and capacity gaps persist in classroom implementation, a challenge consistent with findings from developing country contexts where principals' age, teaching experience, digital culture and teachers' perceptions influence the success or failure of digital transformation. Notably, technology integration was the comparatively lower moderate dimension of principals' digital leadership ($M = 3.18$), suggesting that despite strong digital communication and visionary leadership, translating digital vision into actual classroom practice remains constrained by infrastructural limitations such as inadequate ICT facilities and epileptic power supply in public secondary schools (Akpan & Etor, 2021; Elçiçek, 2022).

The answering of research question two indicated that principals predominantly adopt collaborating, accommodating and compromising conflict management styles, all rated moderate. The dominance of collaborative and accommodating approaches reflects a preference for inclusive and relationship-preserving conflict resolution. This aligns with empirical evidence where collaborative conflict management strategies had strong positive correlations with job satisfaction and teaching quality (Eze, Okafor & Ugwuanyi, 2018). Furthermore, accommodating, collaborating and compromising styles were significantly related to teachers' productivity.

The answering of research question three showed that the level of teachers' productivity was found to be moderate with principals rating teachers favourably across lesson delivery, curriculum coverage and punctuality and attendance. This suggests that teachers in Osun State public secondary schools demonstrate general effectiveness and professional commitment. This finding is consistent with evidence showing that principals' communication, conflict management, supervisory and motivation strategies influence teacher productivity in government secondary schools (Etomes & Molua, 2019), implying that the quality of school leadership creates conditions under which teacher productivity thrives.

The testing of the main hypothesis that principals' digital leadership practices and conflict management skills, considered individually and jointly, do not significantly predict teachers'

productivity was rejected. Both variables made independent and statistically significant contributions, confirming that effective school leadership—digital and relational—is a critical determinant of teacher productivity. This is consistent with evidence that principal digital leadership influences teachers' commitment and school effectiveness (Berkovich & Hassan, 2023) and with findings that adaptive and innovative conflict management strengthens teacher effectiveness and school stability (Eze, Okafor & Ugwuanyi, 2018).

The testing of operational hypothesis one revealed a significant positive relationship between principals' digital leadership practices and teachers' productivity, leading to the rejection of H_{01} . This finding confirms that visionary leadership, digital communication and technology integration are associated with higher teacher productivity. The Pearson correlation coefficient revealed a strong positive relationship between principals' digital leadership practices and teachers' productivity ($r = 0.648$, $p < 0.05$), indicating that as principals' digital leadership improves, teachers' productivity correspondingly increases. This aligns with evidence that schools with leaders possessing high digital capacity—including data-based decision-making, innovation encouragement and collaborative culture-building—experience faster acceleration in learning quality (Ridho et al., 2024; Fullan & Quinn, 2023). The result further resonates with Transformational Leadership Theory, which posits that inspirational and intellectually stimulating leadership elevates follower performance (Bass & Avolio, 1994). Beyond the correlational evidence, the regression analysis further established that digital leadership was a significant independent predictor of teachers' productivity ($\beta = 0.436$, $p < 0.05$), contributing more strongly to the prediction model than conflict management ($\beta = 0.391$, $p < 0.05$). This suggests that among the two predictor variables examined in this study, principals' digital leadership practices exert a comparatively stronger influence on teachers' productivity.

The testing of hypothesis two showed that strong positive relationship was found between conflict management skills and teachers' productivity, resulting in the rejection of H_{02} . Principals who adopt collaborating, compromising and accommodating strategies tend to foster a harmonious school climate that sustains teacher productivity. This supports findings that harmonious working relationships will be jeopardized if the school community is often in conflict, obstructing teaching activities which are central to the provision of qualitative education (Nkomo, et al., 2020). The result is also consistent with the Thomas-Kilmann Conflict Mode framework, which identifies collaborative and integrative approaches as most effective in sustaining organizational performance.

Hypothesis three (H_{03}) was rejected. The principals' rating confirmed that teachers' productivity is high across all dimensions—lesson delivery, curriculum coverage and punctuality and attendance. The rejection of the hypothesis reinforces that both digital leadership and conflict management skills jointly and significantly predict this outcome. This finding is theoretically grounded in General Systems Theory, which views the school as an open system wherein leadership variables function as inputs that transform into measurable productivity outputs. It also aligns with evidence from Ekiti State, Nigeria, showing that teacher involvement in conflict resolution and school management significantly influences teacher productivity (Osiesi, et al., 2023). Together, principals' digital leadership practices and conflict management skills accounted for 25.7% of the variance in teachers' productivity ($R^2 = 0.257$, Adjusted $R^2 = 0.253$), suggesting that while these two leadership competencies are significant predictors, other factors beyond the scope of this study also contribute to teacher productivity in public secondary schools in Osun State.

This study acknowledges certain limitations. The use of self-report instruments may have introduced response bias, while the cross-sectional design limits causal inferences. Additionally, the exclusive focus on Osun State public secondary schools constrains the generalizability of findings. Future studies should consider longitudinal designs, broader geographical coverage and mixed-methods approaches, and may also explore the mediating roles of variables such as school organizational climate and teacher motivation in the relationship between digital leadership, conflict management and teacher productivity.

Conclusion

This study has demonstrated that digital leadership and conflict management are central determinants of teacher productivity in public secondary schools in Osun State, Nigeria. Principals who combine technological vision with constructive conflict resolution create school environments that are simultaneously stimulating, harmonious and productive. Importantly, the lower moderate rating of technology integration signals that institutional support and infrastructure investment must accompany leadership will if digital transformation is to translate meaningfully into classroom practice. These insights call for a reorientation of school leadership development frameworks in Nigeria toward an integrated model that treats digital competence and conflict management as complementary, mutually reinforcing leadership capacities.

Notwithstanding its contributions, this study is bounded by its cross-sectional design, reliance on self-report instruments and exclusive focus on Osun State public secondary schools, which limit causal inferences and generalizability of findings. Future studies should explore longitudinal designs, multi-state samples and the mediating roles of organizational climate and teacher motivation in the relationship between digital leadership, conflict management and teacher productivity across diverse Nigerian educational contexts.

Recommendations

Based on the findings and conclusion of this study, the following recommendations were made:

1. Ministry of Education should organize targeted professional development workshops for principals to move beyond administrative ICT use and focus on leading pedagogical technology integration in classrooms.
2. Government and school stakeholders should prioritize the provision of sustainable ICT infrastructure and stable internet connectivity to support the "visionary leadership" identified in the study.
3. School boards should institutionalize regular leadership training that emphasizes collaborative and accommodating conflict management strategies.
4. School principals who successfully implement digital literacy initiatives should be recognized or rewarded, thereby encouraging a culture of continuous improvement.
5. Principals should leverage their high communication scores to create feedback loops where teachers can contribute to school-wide digital policies, further enhancing the high productivity levels currently reported.

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