

Principals' Leadership Styles and Job Performance of Physics Teachers in Public Secondary Schools in Enugu State, Nigeria

Mbamalu Oby Justina¹ & Eze Claris Nnenna²

¹Department of Science Education, Alex Ekwueme Federal University Ndufu Alike, Ebonyi State, Nigeria

²Department of Educational Management & Foundational Studies, Alex Ekwueme Federal University Ndufu Alike, Ebonyi State, Nigeria

Corresponding Email: obymbamalu@gmail.com

Abstract

This study investigated the extent to which principals' leadership styles predict the job performance of physics teachers in public secondary schools in Enugu State, Nigeria. Four research questions guided the study and four null hypotheses were tested at the 0.05 alpha level. A correlational research design was adopted. The population comprised all 430 vice principals in public secondary schools across the six educational zones in Enugu State. A sample of 239 vice principals was drawn using a multistage sampling approach involving cluster and simple random sampling techniques. Two validated instruments were used for data collection: the Principals' Leadership Styles Questionnaire (PLSQ) and the Job Performance of Physics Teachers Questionnaire (JPPTQ). Cronbach alpha reliability coefficients were established as follows: PLSQ = 0.720; JPPTQ = 0.720; Transformational Leadership subscale = 0.713; Transactional Leadership subscale = 0.703; and Laissez-faire Leadership subscale = 0.869. Multiple and simple regression analyses were used to answer the research questions, while ANOVA associated with multiple regression and t-test associated with simple regression were used to test the null hypotheses. Findings revealed that principals' leadership styles (transformational, transactional, and laissez-faire) jointly and significantly predicted the job performance of physics teachers, accounting for 9.8% of the variance ($F = 8.535$, $p < .05$). Transformational leadership style was the most potent independent predictor of physics teachers' job performance ($R^2 = 9.6\%$, $t = 5.026$, $p < .05$), while transactional and laissez-faire leadership styles did not independently and significantly predict physics teachers' job performance. It is recommended, among other measures, that school principals should enrol in leadership training programmes regularly, adopt transformational leadership strategies specific to the physics classroom context, and create professional environments that support physics teachers' instructional excellence.

Keywords: Principals' leadership styles, Transformational leadership, Transactional leadership, Laissez-faire leadership, Job performance

Introduction

Physics education at the secondary school level occupies a critical position in the national science and technology development agenda of Nigeria, serving as the primary disciplinary gateway through which students are prepared for tertiary studies and careers in engineering, medicine, computing, and the physical sciences (Okeke & Nwosu, 2022; Onyekachi, Ikegbusi & Nwosu, 2021). The quality of physics instruction in Nigerian secondary schools is, in turn, substantially determined by the professional conduct, instructional commitment, and pedagogical competence of physics teachers that is, by their job performance (Adesoji & Ibraheem, 2020; Akani, 2020). Job performance, as a

multidimensional construct, encompasses the totality of behaviours and outcomes that a teacher exhibits and produces in the execution of their professional responsibilities, including lesson planning and delivery, mastery of subject matter, supervision of student work, motivation of learners, and participation in extracurricular and administrative school activities (Campbell et al., 2021; Motowidlo, 2021).

Among the many organisational and institutional factors that influence teacher job performance, the leadership style of the school principal has been identified as one of the most consequential (Bass &

Riggio, 2020; Leithwood & Sun, 2020; Northouse, 2021). The principal, as the chief executive of the school, sets the institutional tone, creates the working environment, defines expectations, provides resources, and motivates staff — all of which directly and indirectly shape the extent to which physics teachers perform their professional duties with commitment, creativity, and effectiveness (Adesoji & Ibraheem, 2020; Ogunleye, 2020). Leadership style, in this context, refers to the characteristic patterns of behaviour that a principal employs in directing, motivating, and managing teachers and other school community members toward the achievement of institutional objectives (Northouse, 2021; Yukl, 2020).

The full-range leadership model advanced by Bass (1985) and subsequently extended by Bass and Riggio (2020) provides the theoretical foundation for this study. This model identifies three distinct leadership styles: transformational leadership, characterised by the principal's capacity to inspire followers to transcend self-interest in the service of collective organisational goals, to stimulate intellectual growth, to provide individualised consideration, and to project an idealised vision; transactional leadership, characterised by contingent reward — the exchange of desired outcomes (praise, recognition, tangible rewards) for performance — and management-by-exception; and laissez-faire leadership, characterised by the virtual absence of leadership behaviour, whereby the principal avoids decision-making, withholds feedback, and abdicates responsibility for staff guidance and motivation (Bass & Riggio, 2020; Northouse, 2021). These three styles have been the subject of extensive empirical investigation globally, but their specific application to the prediction of physics teacher job performance in the Enugu State secondary school context has not been systematically examined.

The job performance of physics teachers in public secondary schools in Enugu State has attracted considerable concern from educational policymakers, parents, students, and the broader scientific community. Observable indicators of sub-optimal physics teacher job performance — including irregular lesson delivery, inadequate laboratory supervision, poor examination performance by students, and limited engagement in professional development — have been documented across Enugu State secondary schools (Eze & Okoro, 2022; Onyekachi et al., 2021). While multiple factors contribute to this situation, the leadership practices of

school principals constitute a significant and modifiable institutional variable that warrants systematic investigation. It is against this background that the present study examined the extent to which principals' leadership styles jointly and independently predict the job performance of physics teachers in public secondary schools in Enugu State, Nigeria.

Job performance, in the general organisational psychology literature, is conceptualised as the aggregate expected value of employee behaviours enacted over a specified period that contribute to the achievement of the organisation's goals (Motowidlo, 2021; Campbell et al., 2021). In the educational context, the job performance of physics teachers encompasses a broad constellation of professional behaviours and outcomes: the preparation and delivery of physics lessons that align with the national curriculum; demonstrated mastery of physics content and pedagogy; supervision and assessment of students' laboratory work and written assignments; motivating student interest in physics through engaging instructional strategies; maintaining effective classroom discipline; participating in school extracurricular and administrative activities; and responding constructively to the professional directives of the principal and departmental leadership (Adeyemi, 2020; Ogunleye, 2020). High job performance in all these domains is essential not only for students' physics learning outcomes but for the broader institutional health of the secondary school and the realisation of Nigeria's STEM education objectives (Okeke & Nwosu, 2022; NERDC, 2023).

Transformational leadership is widely regarded in the educational leadership literature as the style most conducive to teacher professional growth, commitment, and job performance (Bass & Riggio, 2020; Leithwood & Sun, 2020; Northouse, 2021). Transformational principals inspire physics teachers to exceed their own performance expectations by articulating compelling visions of physics education excellence, stimulating innovative approaches to laboratory instruction, providing individualised mentoring and professional support, and modelling the intellectual curiosity and dedication they wish to cultivate in their staff (Leithwood & Sun, 2020; Yukl, 2020). Research conducted across diverse national contexts consistently shows that transformational leadership is positively associated with teacher commitment, pedagogical creativity, and student academic achievement (Bass &

Riggio, 2020; Northouse, 2021). Transactional leadership operates through a fundamentally different mechanism the contingent exchange of rewards for compliance with performance expectations (Bass & Riggio, 2020). Transactional principals specify performance expectations for physics teachers, monitor compliance, and distribute rewards or corrective feedback accordingly. While this style can produce consistent baseline performance, it is generally regarded as insufficient to elicit the intrinsic motivation, creative problem-solving, and professional passion that characterise the highest levels of physics teacher performance (Yukl, 2020; Northouse, 2021). Laissez-faire leadership, by contrast, represents the near-total absence of leadership engagement: principals operating in this style avoid making decisions, withhold feedback, and leave physics teachers without the institutional direction, support, or accountability necessary for sustained high performance (Bass & Riggio, 2020). Studies consistently associate laissez-faire leadership with teacher disengagement, low morale, and deteriorating instructional quality (Northouse, 2021; Leithwood & Sun, 2020).

Statement of the Problem

The job performance of physics teachers in public secondary schools in Enugu State has been characterised as inconsistent, with a significant proportion of teachers exhibiting inadequate lesson preparation, irregular laboratory instruction, and poor student academic guidance (Eze & Okoro, 2022; Onyekachi et al., 2021). Although the leadership style of the school principal has been identified as a potentially significant predictor of teacher job performance in various Nigerian state contexts (Adeyemi, 2020; Ogunleye, 2020), no empirical study, to the knowledge of the researchers, has specifically examined the independent and joint predictive contributions of principals' transformational, transactional, and laissez-faire leadership styles to the job performance of physics teachers in Enugu State public secondary schools. This gap in the literature, and its practical consequences for physics education quality in the state, constitutes the central problem addressed by this study.

Purpose of the Study

The main purpose of this study was to investigate the extent to which principals' leadership styles predict the job performance of physics teachers in public secondary

schools in Enugu State, Nigeria. Specifically, the study aimed to:

1. find out the extent to which principals' leadership styles (transformational, transactional, and laissez-faire) jointly predict the job performance of physics teachers in public secondary schools in Enugu State;
2. determine the extent to which transformational leadership predicts the job performance of physics teachers in public secondary schools in Enugu State;
3. ascertain the extent to which transactional leadership predicts the job performance of physics teachers in public secondary schools in Enugu State; and
4. examine the extent to which laissez-faire leadership predicts the job performance of physics teachers in public secondary schools in Enugu State.

Research Questions

1. To what extent do principals' leadership styles (transformational, transactional, and laissez-faire) jointly predict the job performance of physics teachers in public secondary schools in Enugu State?
2. To what extent does transformational leadership predict the job performance of physics teachers in public secondary schools in Enugu State?
3. To what extent does transactional leadership predict the job performance of physics teachers in public secondary schools in Enugu State?
4. To what extent does laissez-faire leadership predict the job performance of physics teachers in public secondary schools in Enugu State?

Null Hypotheses

The following null hypotheses were tested at the 0.05 alpha level:

- H0₁: Principals' leadership styles (transformational, transactional, and laissez-faire) jointly do not significantly predict the job performance of physics teachers in public secondary schools in Enugu State.
- H0₂: Transformational leadership does not significantly predict the job performance of physics teachers in public secondary schools in Enugu State.
- H0₃: Transactional leadership does not significantly predict the job performance of physics teachers in public secondary schools in Enugu State.

H0₄: Laissez-faire leadership does not significantly predict the job performance of physics teachers in public secondary schools in Enugu State.

Review of Related Literature

The transformational leadership theory, originally articulated by Burns (1978) and subsequently operationalised for organisational research by Bass and Riggio (2020), holds that leaders who inspire, intellectually stimulate, and individually consider their followers produce significantly higher levels of follower motivation, commitment, and performance than leaders who rely on transactional exchange or who abdicate leadership responsibility. In the school context, transformational principals communicate a compelling vision for science education excellence, challenge physics teachers to innovate their laboratory instructional practices, provide coaching and mentoring support for professional development, and model the values of intellectual rigour and student-centred instruction (Leithwood & Sun, 2020; Northouse, 2021). Research conducted by Mkpa (2021) across public secondary schools in south-eastern Nigeria found that transformational leadership significantly predicted physics teachers' instructional commitment and lesson delivery quality. Similarly, Ogunleye (2020) found that transformational principal leadership was the strongest predictor of science teacher performance across all six Nigerian geopolitical zones.

Transactional leadership operates through contingent reward and management-by-exception, whereby the principal establishes clear performance expectations, monitors compliance, and distributes rewards or corrective feedback based on performance relative to expectations (Bass & Riggio, 2020; Yukl, 2020). In the physics teaching context, transactional principals may establish clear lesson preparation requirements, monitor laboratory supervision activities, and provide recognition for meeting examination performance targets — all of which can sustain consistent baseline performance. However, because transactional leadership does not address teachers' intrinsic motivation, professional growth needs, or sense of collective purpose, it is generally insufficient to elicit the creativity, dedication, and continuous professional improvement that distinguish outstanding physics teachers from adequate ones (Northouse, 2021). Adeyemi (2020) found that transactional leadership contributed only marginally to physics teacher performance, while Leithwood and Sun (2020)

concluded that transactional leadership, while maintaining performance floors, rarely elevates teacher performance to exceptional levels.

Laissez-faire leadership, characterised by the principal's avoidance of decision-making, feedback provision, and active engagement with staff, represents what Bass and Riggio (2020) describe as the least effective and potentially most harmful leadership approach in educational settings. Physics teachers operating under laissez-faire principals receive minimal institutional direction, professional feedback, or motivational support, leaving them to navigate the complex demands of physics curriculum implementation, laboratory management, and student assessment largely in professional isolation (Northouse, 2021; Yukl, 2020). Eze and Okoro (2022) found that schools characterised by laissez-faire principal leadership exhibited the lowest physics teacher performance indicators including irregular laboratory instruction, inadequate lesson preparation, and poor student supervision of all leadership style categories examined in their Enugu State study. These findings reinforce the consistent conclusion in the educational leadership literature that leadership absence is not neutral but actively corrosive to teacher performance and institutional functioning (Leithwood & Sun, 2020).

Methodology Research Design

A correlational research design was adopted for this study. This design is appropriate for investigating the extent and direction of relationships between variables in this case, between principals' leadership styles and physics teachers' job performance without manipulating any of the variables (Creswell & Creswell, 2022). The correlational design also permits regression analysis, which enables the determination of the unique and combined predictive contributions of the independent variables (leadership styles) to the dependent variable (physics teacher job performance).

The population comprised all 430 vice principals in public secondary schools across the six educational zones in Enugu State: Enugu, Nsukka, Agbani, Udi, Obollo-Afor, and Awgu. Vice principals were selected as key informants because, as the immediate supervisory link between the principal and classroom teachers, they are uniquely positioned to observe and report on both principals' leadership behaviours and physics teachers' job performance. A sample of 239 vice

principals was drawn using a multistage sampling approach: cluster sampling was first applied to select schools from each educational zone proportionate to zone size, followed by simple random sampling to select individual vice principals within the selected schools. Two validated instruments were used for data collection. The Principals' Leadership Styles Questionnaire (PLSQ) consisted of 40 items distributed across three clusters: 25 items on transformational leadership (items 1–25), eight items on transactional leadership (items 26–33), and seven items on laissez-faire leadership (items 34–40), all structured on a four-point Likert scale of Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). The Job Performance of Physics Teachers Questionnaire (JPPTQ) consisted of 40 items rated on a four-point scale of Very Frequently (4), Frequently (3), Often (2), and Never (1), measuring physics teachers' performance across domains including lesson preparation, laboratory instruction, student supervision, assessment practices, extracurricular participation, and response to administrative directives.

Both instruments were face and content validated by experts in educational management and science education. Cronbach alpha reliability coefficients

established through a pilot administration to 30 vice principals outside the main sample were: PLSQ = 0.720; JPPTQ = 0.720; transformational leadership subscale = 0.713; transactional leadership subscale = 0.703; laissez-faire subscale = 0.869. The instruments were administered personally by the researchers with the assistance of three trained research assistants, and all completed copies were retrieved on the same day. Multiple regression analysis was used to answer Research Question 1 and test Hypothesis 1, while simple regression analysis was applied separately for Research Questions 2, 3, and 4 and their corresponding hypotheses. ANOVA associated with multiple regression was used to test Hypothesis 1, and t-tests associated with simple regression were used to test Hypotheses 2, 3, and 4. All analyses were conducted using the Statistical Package for the Social Sciences (SPSS, Version 26.0) at an alpha level of 0.05.

Results

Research Question 1: To what extent do principals' leadership styles (transformational, transactional, and laissez-faire) jointly predict the job performance of physics teachers in public secondary schools in Enugu State? Tables 1a and 1b present the multiple regression model summary and ANOVA results respectively.

Table 1a: Multiple Regression Model Summary - Joint Prediction of Principals' Leadership Styles on Job Performance of Physics Teachers (N = 239)

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate	Model Significance
1	.313 ^a	.098	.087	19.845	F(3,235) = 8.535, p = .000 ^a

Table 1a reveals that the multiple correlation coefficient (R) between the three principals' leadership styles combined and physics teachers' job performance is .313, with a coefficient of determination (R²) of .098. This indicates that principals' leadership styles (transformational, transactional, and laissez-faire) jointly accounted for 9.8% of the variance in the job

performance of physics teachers in public secondary schools in Enugu State, with the remaining 90.2% of variance attributable to other factors not captured in the current model. The adjusted R² of .087 confirms that this predictive contribution remains meaningful and does not inflate the variance explained after accounting for model complexity and sample size.

Table 1b: ANOVA Associated with Multiple Regression - Joint Prediction of Principals' Leadership Styles on Job Performance of Physics Teachers

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	10,083.651	3	3,361.217	8.535	.000 ^a — Significant
Residual	92,549.286	235	393.827		
Total	102,632.937	238			

Table 1b shows that the ANOVA associated with the multiple regression yielded an F-value of 8.535 with degrees of freedom of 3 and 235, and a probability value of .000, which is less than the alpha level of .05. The null hypothesis H_{01} is therefore rejected, confirming that principals' leadership styles (transformational, transactional, and laissez-faire) jointly and significantly

predict the job performance of physics teachers in public secondary schools in Enugu State. The significant regression sum of squares of 10,083.651 relative to the total sum of squares of 102,632.937 provides further confirmation that the joint leadership style model adds significant explanatory power beyond the intercept-only baseline.

Research Question 2: To what extent does transformational leadership predict the job performance of physics teachers in public secondary schools in Enugu State? Tables 2a and 2b present the model summary and regression coefficients.

Table 2a: Simple Regression Model Summary - Transformational Leadership Predicting Job Performance of Physics Teachers (N = 239)

Model	R	R ²	Adjusted R ²	Variance Explained (%)	Sig.
1	.310 ^a	.096	.092	9.6%	.000

Table 2a reveals that transformational leadership style has a regression coefficient (R) of .310 and a coefficient of determination (R²) of .096, indicating that transformational leadership independently accounted for 9.6% of the variance in physics teachers' job performance in public secondary schools in Enugu State. This percentage of explained variance, while

modest, is educationally meaningful given the complexity of the teaching performance construct and the multiplicity of factors that influence it, and confirms transformational leadership as the most potent independent predictor among the three leadership styles examined in this study.

Table 2b: t-test Associated with Simple Regression - Transformational Leadership Predicting Job Performance of Physics Teachers

Predictor	B	Std. Error	β (Beta)	t	Sig.	Decision
(Constant)	90.552	6.338	-	14.287	.000	—
Transformational LS	0.455	0.091	.310	5.026	.000	Significant - H_{02} rejected

Table 2b shows that the t-test value associated with simple regression for transformational leadership was 5.026 ($B = 0.455$, $\beta = .310$, $p = .000$), which is statistically significant at the .05 alpha level. The null hypothesis H_{02} is therefore rejected; transformational leadership significantly and independently predicts the job performance of physics teachers in public secondary

schools in Enugu State. The positive unstandardized coefficient ($B = 0.455$) confirms that as principals' transformational leadership score increases by one unit, physics teachers' job performance increases by approximately 0.455 units, holding all other predictors constant.

Research Question 3: To what extent does transactional leadership predict the job performance of physics teachers in public secondary schools in Enugu State? Tables 3a and 3b present the results.

Table 3a: Simple Regression Model Summary -Transactional Leadership Predicting Job Performance of Physics Teachers (N = 239)

Model	R	R ²	Adjusted R ²	Variance Explained (%)	Sig.
1	.089 ^a	.008	.004	0.8%	.171

Table 3a reveals that transactional leadership style has a regression coefficient (R) of .089 and a coefficient of determination (R²) of .008, indicating that transactional leadership independently accounts for only 0.8% of the variance in physics teachers' job performance in public secondary schools in Enugu State. This minimal

explanatory contribution confirms that transactional leadership, operating through contingent reward and management-by-exception, exerts only a marginal independent effect on physics teacher job performance in the Enugu State context.

Table 3b: t-test Associated with Simple Regression - Transactional Leadership Predicting Job Performance of Physics Teachers

Predictor	B	Std. Error	β (Beta)	t	Sig.	Decision
(Constant)	112.101	7.158	—	15.661	.000	—
Transactional LS	0.450	0.328	.089	1.372	.171	Not Significant - H ₀₃ retained

Table 3b shows that the t-test value associated with simple regression for transactional leadership was 1.372 (B = 0.450, β = .089, p = .171), which does not reach statistical significance at the .05 alpha level. The null hypothesis H₀₃ is therefore not rejected; transactional leadership independently does not significantly predict

the job performance of physics teachers in public secondary schools in Enugu State. The non-significant result, combined with the minimal R² of .008, confirms that the transactional exchange mechanism is insufficient on its own to produce meaningful variation in physics teachers' professional performance.

Research Question 4: To what extent does laissez-faire leadership predict the job performance of physics teachers in public secondary schools in Enugu State? Tables 4a and 4b present the results.

Table 4a: Simple Regression Model Summary - Laissez-faire Leadership Predicting Job Performance of Physics Teachers (N = 239)

Model	R	R ²	Adjusted R ²	Variance Explained (%)	Sig.
1	.064 ^a	.004	.000	0.4%	.324

Table 4a reveals that laissez-faire leadership style has the lowest regression coefficient (R = .064) and coefficient of determination (R² = .004) among all three leadership styles, indicating that laissez-faire leadership independently accounts for only 0.4% of the variance in physics teachers' job performance in public secondary

schools in Enugu State. This near-zero explanatory contribution is consistent with the theoretical characterisation of laissez-faire leadership as an absence of meaningful leadership behaviour and confirms its negligible predictive utility for physics teacher job performance.

Table 4b: t-test Associated with Simple Regression - Laissez-faire Leadership Predicting Job Performance of Physics Teachers

Predictor	B	Std. Error	β (Beta)	t	Sig.	Decision
(Constant)	121.462	1.374	—	88.381	.000	—
Laissez-faire LS	0.011	0.011	.064	0.988	.324	Not Significant — H_0 retained

Table 4b shows that the t-test value associated with simple regression for laissez-faire leadership was 0.988 ($B = 0.011$, $\beta = .064$, $p = .324$), which is not statistically significant at the .05 alpha level. The null hypothesis H_0 is therefore not rejected; laissez-faire leadership independently does not significantly predict the job

performance of physics teachers in public secondary schools in Enugu State. The negligible unstandardised coefficient ($B = 0.011$) further confirms that variations in laissez-faire principal behaviour produce virtually no measurable change in physics teacher job performance outcomes.

Summary of All Regression Findings

Table 5 presents an integrated summary of the model statistics, statistical test values, significance levels, and decisions across all four research questions and their corresponding hypotheses.

Table 5: Summary of Multiple and Simple Regression Findings on the Prediction of Physics Teachers' Job Performance by Principals' Leadership Styles (N = 239)

Leadership Style / Combination	R	R ²	Adj. R ²	F / t Value	Sig. (p)	Decision
Joint						
(Transformational + Transactional + Laissez-faire)	.313	.098	.087	F = 8.535	.000	Significant
Transformational leadership style (independent)	.310	.096	.092	t = 5.026	.000	Significant
Transactional leadership style (independent)	.089	.008	.004	t = 1.372	.171	Not Significant
Laissez-faire leadership style (independent)	.064	.004	.000	t = 0.988	.324	Not Significant

Alpha level $\alpha = .05$ (two-tailed). R = correlation coefficient; R² = coefficient of determination. F reported for joint (multiple) regression (df = 3, 235); t reported for independent (simple) regression (df = 237). LS = Leadership Style. Significant = $p \leq .05$; Not Significant = $p > .05$.

Discussion of Findings

The finding that principals' leadership styles (transformational, transactional, and laissez-faire) jointly and significantly predicted 9.8% of the variance in physics teachers' job performance ($F = 8.535$, $p =$

.000) is consistent with the growing body of evidence affirming the institutional significance of principal leadership in shaping teacher professional behaviour (Leithwood & Sun, 2020; Northouse, 2021). This finding aligns with Ogunleye (2020), who found that a composite of principal leadership approaches collectively accounted for a significant proportion of science teacher performance variance across Nigerian secondary schools, and with Adeyemi (2020), who similarly documented a significant joint prediction of leadership styles on teacher job performance in Ekiti State. The fact that approximately 90.2% of physics

teacher job performance variance remains unexplained by the leadership model alone confirms that other institutional factors — including remuneration, resource availability, professional development access, and school culture — also exert substantial influence on physics teacher performance and must be addressed through complementary policy interventions (Eze & Okoro, 2022; Onyekachi et al., 2021).

The finding that transformational leadership significantly and independently predicted physics teachers' job performance ($R^2 = 9.6\%$, $t = 5.026$, $p = .000$) confirms the primacy of transformational leadership as the most educationally productive leadership style in the physics classroom context. This result is strongly supported by Bass and Riggio (2020), who demonstrated through meta-analysis that transformational leadership consistently produces the highest levels of follower performance and commitment across organisational settings, and by Leithwood and Sun (2020), who showed that transformational principal leadership exerts significant positive effects on teacher professional commitment, pedagogical innovation, and student academic achievement in secondary schools. Specifically in the science education context, Mkpa (2021) found that transformational principal leadership significantly predicted physics teacher instructional commitment and lesson delivery quality in south-eastern Nigeria, while Ogunleye (2020) documented a positive and significant relationship between transformational leadership and science teacher performance across six Nigerian geopolitical zones - both findings that are directly consistent with the present result. The positive standardised coefficient ($\beta = .310$) confirms that as principals exhibit more transformational behaviours - articulating a vision for physics education excellence, stimulating innovative laboratory instruction, and providing individualised professional mentoring - physics teachers demonstrably improve their job performance.

The finding that transactional leadership independently did not significantly predict physics teachers' job performance ($R^2 = 0.8\%$, $t = 1.372$, $p = .171$) is consistent with the theoretical position that transactional leadership, operating through contingent reward and management-by-exception, is insufficient to elicit the intrinsic professional motivation and creative pedagogical commitment required for outstanding physics teaching (Bass & Riggio, 2020; Northouse, 2021). This finding is in agreement with Yukl (2020),

who concluded that the exchange-based mechanism of transactional leadership is unlikely to produce passion and sustained commitment among followers, and with Leithwood and Sun (2020), who found that transactional leadership maintained performance consistency but failed to elevate teacher performance to exceptional levels in science education contexts. While Adeyemi (2020) found that transactional leadership contributed marginally to teacher job performance in some Nigerian secondary school settings — a finding echoed by the present study's non-significant but positive coefficient ($B = 0.450$) — the present result confirms that this marginal contribution does not reach statistical significance, suggesting that the contingent reward practices available to Enugu State secondary school principals may be too limited, inconsistently applied, or insufficiently motivating to produce measurable performance effects among physics teachers.

The finding that laissez-faire leadership independently did not significantly predict physics teachers' job performance ($R^2 = 0.4\%$, $t = 0.988$, $p = .324$) is consistent with the consensus position in the educational leadership literature that leadership absence is pedagogically and institutionally inconsequential at best and actively harmful at worst (Bass & Riggio, 2020; Northouse, 2021). This result aligns with Leithwood and Sun (2020), who found that laissez-faire principal behaviour was associated with reduced teacher motivation, increased professional isolation, and deteriorating instructional quality in secondary school science departments, and with Eze and Okoro (2022), who documented that physics departments in Enugu State schools characterised by laissez-faire principal leadership exhibited the lowest rates of lesson preparation, laboratory instruction, and student supervision. The near-zero predictive coefficient ($B = 0.011$, $\beta = .064$) confirms that laissez-faire leadership produces virtually no systematic change in physics teacher job performance - neither the slight improvement that even weak transactional mechanisms can produce, nor the substantial enhancement that transformational leadership reliably generates (Yukl, 2020). The implication is that principals who abdicate their leadership responsibilities in the physics education context are neither helping nor significantly harming teachers' baseline performance, but are critically foregoing the performance-enhancing influence that more active leadership styles especially transformational leadership - could provide.

Conclusion

Based on the findings of this study, it is concluded that principals' leadership styles (transformational, transactional, and laissez-faire) jointly and significantly predict the job performance of physics teachers in public secondary schools in Enugu State, collectively accounting for 9.8% of the performance variance; that transformational leadership is the most potent independent predictor of physics teacher job performance, significantly and positively contributing 9.6% of performance variance; and that transactional and laissez-faire leadership styles do not independently and significantly predict physics teacher job performance in Enugu State public secondary schools, confirming that leadership absence and contingent-reward-based leadership are insufficient substitutes for the vision-driven, people-centred, and intellectually stimulating approach of transformational leadership in fostering physics teaching excellence.

Recommendations

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

1. School principals in Enugu State public secondary schools should deliberately and systematically adopt transformational leadership practices in their engagement with physics teachers including articulating a compelling vision for physics education quality in the school, providing individualised professional mentoring for physics teachers, stimulating innovative laboratory and classroom instructional approaches, and modelling intellectual passion for scientific inquiry such as these behaviours have been empirically demonstrated to produce the most significant improvements in physics teacher job performance.
2. The Enugu State Government, through the Post Primary Schools Management Board (PPSMB), should design and implement regular, structured leadership training programmes specifically tailored to secondary school principals, with dedicated modules on transformational leadership theory and practice in STEM education contexts, so that principals are equipped with the evidence-based leadership competencies necessary to elevate physics teacher job performance.
3. Principals should create professionally stimulating, institutionally supportive, and physically safe school environments for physics teachers - including functional physics

laboratories, adequate instructional materials, stable power supply, and professional development opportunities.

4. The Ministry of Education in Enugu State should establish a systematic, transparent, and merit-based performance evaluation and reward system for physics teachers in public secondary schools, enabling principals to apply the contingent-reward dimension of transactional leadership more effectively and consistently.
5. Further research should investigate the additional factors accounting for the 90.2% of physics teacher job performance variance unexplained by leadership styles alone - including teacher remuneration adequacy, professional development quality, laboratory resource availability, student behaviour, and school culture to provide a more comprehensive empirical basis for policy interventions aimed at improving physics teacher job performance and student physics learning outcomes in Enugu State and comparable Nigerian educational contexts.

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