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**LEADERSHIP BEHAVIOUR AND TEACHERS' PARTICIPATION IN
CONTINUOUS PROFESSIONAL DEVELOPMENT: THE MEDIATING ROLE
OF PROFESSIONAL LEARNING COMMUNITIES**

E. C. Okwuagwu

Department of Education Management, University of Abuja, Nigeria

ABSTRACT

This study examined the association between educational leadership behaviour and teachers' participation in continuous professional development (CPD), with professional learning communities (PLCs) tested as a statistical mediator among public senior secondary school teachers in the Federal Capital Territory (FCT), Abuja. The study adopted a cross-sectional descriptive-correlational survey design. Twenty-seven schools were selected from the 88 public senior secondary schools in the FCT, and 361 teachers provided usable responses. Data were collected with the Leadership Behaviour, Professional Learning Communities and Teachers' Continuous Professional Development Participation Questionnaire (LBPLC-TCPDPQ). Pearson product-moment correlation, simple linear regression and regression-based mediation analysis with 10,000 bootstrap resamples were applied. Educational leadership behaviour correlated positively with CPD participation, $r(359) = .48, p < .001$, and significantly predicted PLC participation, $\beta = .61, p < .001$. PLC participation also predicted CPD participation, $\beta = .65, p < .001$. The indirect association between educational leadership behaviour and CPD participation through PLC participation was statistically significant, $B = 0.35, SE = 0.04, 95\%$ bootstrap CI $[0.27, 0.43]$. PLC participation accounted for 71.9% of the standardised total modelled effect, while the direct effect remained significant, indicating partial mediation. The findings suggest that leadership support is more strongly connected with sustained teacher learning when schools organise collaborative professional learning as a regular part of teachers' work. The study recommends protected time for collaborative inquiry, stronger distributed facilitation, needs-based CPD planning and systematic follow-up of externally organised professional development.

Keywords: educational leadership behaviour; professional learning communities; continuous professional development; teacher participation; mediation analysis; public senior secondary schools.

1. INTRODUCTION

Teachers' participation in continuous professional development is central to the renewal of pedagogical knowledge, curriculum implementation and sustained improvement in classroom practice. Contemporary research increasingly treats professional learning as an extended process that combines formal courses with coaching, collaborative inquiry, professional dialogue and school-based learning. Ventista and Brown (2023), in a systematic review of teacher professional learning, reported that sustained and collaborative forms of professional development can support teacher learning and student outcomes more effectively when participation extends beyond isolated events. In the Nigerian context, Osiesi, Odinko, and Blignaut (2024) similarly documented perceived gains in professional competence and exchange of professional ideas among teachers who participated in the Teachers' Registration Council of Nigeria's mandatory professional-development programme. These findings direct attention from simple access to professional development towards the conditions that encourage teachers to participate continuously and apply new learning.

School leadership forms one of those conditions because principals allocate time, organise supervision, communicate instructional priorities, provide feedback and determine whether teacher learning receives practical support. He, Guo, and Abazie (2024) found that principals' instructional leadership significantly predicted teachers' professional development in public secondary schools in Anambra State, Nigeria. Ajaegbu, Ogunji, and Enyinnaya (2025) also reported that leadership support, peer collaboration, resources and government policy significantly shaped teachers' professional-development participation in Lagos State. Accordingly, leadership behaviour should be examined as a set of observable practices that can create or restrict opportunities for professional learning, instead of as a formal administrative position alone.

Professional learning communities provide a useful organisational explanation for how such leadership practices may connect with teachers' continuing learning. PLCs organise teachers around shared instructional goals, reflective dialogue, collaborative planning, peer support and collective examination of practice. Reviewing 70 empirical studies from the Global South, Nguyen, Boeren, Maitra, and Cabus (2024) identified leadership support, adequate organisational conditions, a clear focus on teaching and learning, and trusting professional relationships as recurring conditions for productive PLCs. Huijboom, van Meeuwen, Rusman, and Vermeulen (2023) likewise showed that PLC development depended on proactive leadership, skilled facilitation, purposeful professional dialogue and organised meetings. Evidence from data-use PLCs further indicates that sustainability depends on leadership practices that convert collaborative routines into regular school practice (van den Boom-Muilenburg et al., 2023).

Recent studies also support the proposition that leadership can operate indirectly through collaborative professional structures. Zhang, Huang, and Ye (2023) found that dimensions of PLCs statistically mediated associations between leadership practices and teacher collective efficacy. Liu and Hallinger (2024) reported direct and indirect relationships linking instructional leadership, teacher responsibility and PLC development. More recently, Gu, Liu, and Hang (2025) demonstrated that several leadership practices were positively associated with PLCs and that perceived trust significantly mediated those relationships. Although these studies used different outcomes and settings, they collectively support a process in which leadership behaviour relates to teacher outcomes partly through the collaborative conditions that leaders help establish.

The issue is especially relevant in the FCT. Abenu and Alfa Yusufu (2024) reported that 86.2% of teachers in their FCT sample had accessed professional development, but only 48.6% had benefited from government-sponsored programmes. They also identified irregular appraisal, inadequate funding, poorly organised activities and limited responsiveness to teachers' professional needs. Access therefore does not necessarily indicate continuity, collaboration or instructional relevance. A school may send teachers to workshops and still provide little opportunity for follow-up dialogue, peer learning, collective lesson development or evidence-informed reflection after the programme ends.

Against this background, the present study examined the relationship between educational leadership behaviour and teachers' participation in CPD and tested whether PLC participation statistically mediated that relationship among public senior secondary school teachers across the six Area Councils of the FCT. The study extends Nigerian evidence in two respects. First, it separates leadership behaviour, PLC participation and CPD participation as distinct constructs. Second, it tests an indirect pathway instead of limiting analysis to separate bivariate relationships. Because the design is cross-sectional, the mediation estimate is interpreted as an indirect statistical association consistent with the proposed model and does not establish temporal causation.

Statement of the Problem

Teachers' professional-development participation in Nigeria remains uneven and strongly dependent on organisational support. In the FCT, Abenu and Alfa Yusufu (2024) found substantial access to professional development but also reported irregular appraisal, inadequate funding, limited personalisation and uneven sponsorship. In Lagos State, Ajaegbu et al. (2025) observed only moderate professional-development participation and identified leadership support and peer collaboration among the factors associated with teachers' engagement. He et al. (2024) reached a related conclusion in Anambra State by showing that instructional leadership significantly predicted teachers' professional

development. Taken together, these Nigerian studies indicate that the availability of programmes alone does not guarantee sustained participation.

A second problem concerns how leadership support is translated into teacher learning. Much Nigerian research has treated leadership support, collaboration, resources and policy as separate predictors. However, recent international evidence suggests that collaborative professional structures may connect leadership behaviour with teacher-related outcomes. PLC research from the Global South documents the importance of leadership support and trusting relationships (Nguyen et al., 2024), while mediation studies show indirect associations linking leadership practices with PLCs, collective efficacy and professional outcomes (Gu et al., 2025; Liu & Hallinger, 2024; Zhang et al., 2023). The available Nigerian evidence has not sufficiently tested whether PLC participation performs a similar statistical mediating function for teachers' CPD participation.

The empirical problem, therefore, is the absence of clear evidence on whether educational leadership behaviour relates to teachers' CPD participation mainly through direct support or partly through teachers' participation in PLCs. Without such evidence, educational managers may continue to treat leadership, collaboration and CPD as separate administrative concerns. This study addressed that gap by testing the direct relationships among educational leadership behaviour, PLC participation and CPD participation, followed by a mediation model among public senior secondary school teachers in the FCT.

Objectives of the Study

1. determine the relationship between educational leadership behaviour and teachers' participation in continuous professional development.
2. examine the relationship between educational leadership behaviour and teachers' participation in professional learning communities.
3. assess the relationship between teachers' participation in professional learning communities and their participation in continuous professional development.
4. determine the extent to which professional learning communities statistically mediate the relationship between educational leadership behaviour and teachers' participation in continuous professional development.

Research Questions

1. What relationship exists between educational leadership behaviour and teachers' participation in continuous professional development?
2. What relationship exists between educational leadership behaviour and teachers' participation in professional learning communities?
3. What relationship exists between teachers' participation in professional learning communities and their participation in continuous professional development?
4. To what extent do professional learning communities statistically mediate the relationship between educational leadership behaviour and teachers' participation in continuous professional development?

Research Hypotheses

The following null hypotheses were tested at the .05 level of significance:

H₀₁: There is no significant relationship between educational leadership behaviour and teachers' participation in continuous professional development.

H₀₂: There is no significant relationship between educational leadership behaviour and teachers' participation in professional learning communities.

H₀₃: There is no significant relationship between teachers' participation in professional learning communities and their participation in continuous professional development.

H₀₄: Professional learning communities do not significantly mediate the relationship between educational leadership behaviour and teachers' participation in continuous professional development.

2. CONCEPTUAL REVIEW

Educational Leadership Behaviour

Educational leadership behaviour refers to the observable actions through which school leaders establish instructional direction, support professional growth, distribute responsibility, provide feedback and organise conditions for collaborative learning. The concept therefore focuses on what leaders do in relation to teaching and teacher learning. He et al. (2024) showed in a Nigerian secondary-school setting that instructional leadership significantly predicted teacher professional development, while Liu and Hallinger (2024) demonstrated that instructional leadership was related to PLC development through both

direct and indirect paths. These studies support an operational view of leadership behaviour as enacted practices that organise professional learning.

Leadership support for professional learning also includes relational and organisational dimensions. Gu et al. (2025) reported that setting direction, developing people, redesigning the organisation and managing the instructional programme were each positively associated with PLCs, with perceived trust performing a mediating function. At team level, transformational leadership has also been associated with information sharing and goal interdependence in teachers' professional learning (Oude Groote Beverborg, 2024). In the present study, educational leadership behaviour was therefore operationalised through teachers' perceptions of shared professional direction, instructional guidance, professional support, feedback, trust, distributed responsibility and resource provision.

Professional Learning Communities

Professional learning communities are structured arrangements through which teachers pursue shared instructional goals, examine practice, exchange professional knowledge and assume collective responsibility for improvement. Their distinguishing feature is sustained collaborative learning tied to teachers' work. Nguyen et al. (2024) concluded from a Global South review that authentic PLC participation can support collaborative professional learning, efficacy, innovative teaching and interpersonal trust. Huijboom et al. (2023) also documented the importance of proactive leadership, facilitation, purposeful discourse and organised meetings for PLC development.

The quality of participation matters as much as the existence of a formal group. Van den Boom-Muilenburg et al. (2023) found that sustaining data-use PLCs required leadership practices that supported routines and active participation, while Grimm (2024) examined how teacher leadership operates through learning conversations directed towards teaching improvement. Digital forms can broaden participation as well. Jin, Song, Cheung, Lin, and Liu (2024), reviewing online PLC research, identified collaboration, knowledge sharing, rapid support, expanded networks and flexible participation as important technological affordances. Accordingly, PLC participation in this study referred to teachers' engagement in collaborative planning, reflective dialogue, peer learning, collective inquiry, knowledge sharing and shared evaluation of instructional practice.

Teachers' Participation in Continuous Professional Development

Teachers' participation in CPD denotes the frequency and extent of engagement in formal and informal activities intended to strengthen professional knowledge, pedagogical skill and instructional judgement. Such activities may include workshops, seminars, mentoring, coaching, professional reading, digital learning, action research and collaborative lesson development. Ventista and Brown (2023) found that teacher professional learning takes

multiple forms and that sustained, collaborative and coaching-oriented approaches can be associated with stronger outcomes than episodic participation alone.

Nigerian evidence reinforces the need to distinguish access from sustained and professionally relevant participation. Abenu and Alfa Yusufu (2024) found broad access to professional development in the FCT but documented weaknesses in funding, organisation, regular appraisal and responsiveness to teachers' needs. Osiesi et al. (2024) reported perceived professional benefits from Nigeria's mandatory continuing professional-development programme, while Ajaegbu et al. (2025) identified leadership support and peer collaboration among the factors associated with participation in Lagos public secondary schools. The present study therefore treated CPD participation as continuing engagement across formal and school-based learning activities instead of attendance at isolated events.

Mediating Role of Professional Learning Communities

A mediation model estimates whether the statistical association between a predictor and an outcome is partly represented by an intervening variable. Applied to the present study, educational leadership behaviour is expected to relate to teachers' PLC participation, which in turn is expected to relate to CPD participation. The model therefore tests whether part of the leadership–CPD association is represented by teachers' collaborative professional learning.

Recent empirical studies provide a basis for this proposition. Zhang et al. (2023) demonstrated that PLC dimensions mediated associations between leadership practices and teacher collective efficacy. Liu and Hallinger (2024) similarly reported indirect relationships connecting instructional leadership, teacher responsibility and PLC development. Gu et al. (2025) found that trust mediated the association between several leadership practices and PLCs, while Liu and Yin (2024) showed that PLCs were connected with student mathematics achievement through collective teacher efficacy and instructional processes. These findings do not establish the precise model tested in the FCT, but they indicate that indirect organisational pathways deserve explicit examination.

Analytical Framework

The analytical framework specified educational leadership behaviour as the predictor, teachers' participation in professional learning communities as the mediator and teachers' participation in CPD as the outcome. The first path tested the relationship between leadership behaviour and PLC participation. The second tested the relationship between PLC participation and CPD after leadership behaviour was considered. The direct path estimated the leadership–CPD relationship after PLC participation entered the model, while the indirect path represented the product of the leadership-to-PLC and PLC-to-CPD coefficients. Partial mediation was inferred where the bootstrapped indirect effect excluded

zero and the direct effect remained statistically significant. Because all variables were measured at one time, the model is interpreted as an explanatory statistical pattern instead of evidence of temporal causal ordering.

Empirical Review

Abenu and Alfa Yusufu (2024) used a mixed-method design to appraise professional development among 109 primary and secondary school teachers drawn from four schools in the FCT. They reported that 86.2% of respondents had participated in professional-development activities, while 48.6% had benefited from government sponsorship. They further identified inadequate funding, irregular appraisal, poor organisation and limited personalisation as constraints. The study is directly relevant to the present setting, but its small purposive sample combined primary and secondary teachers and did not test leadership behaviour or PLC participation.

Ajaegbu et al. (2025) surveyed 288 teachers in 15 public secondary schools in Ikorodu, Lagos State. They reported moderate professional-development participation and identified leadership support, peer collaboration, resources and government policy as significant factors. Their analysis demonstrates that school and policy conditions matter for participation. However, the study treated these conditions as determinants instead of testing a specific indirect pathway from leadership through PLC participation to CPD.

He et al. (2024) examined 304 teachers and 19 principals in public secondary schools in Awka South, Anambra State. Their regression analysis showed that instructional leadership significantly predicted teacher professional development. This Nigerian evidence strengthens the argument that leadership behaviour is relevant to teacher learning. However, the study concentrated on instructional leadership functions and did not examine PLC participation as a mediator.

Osiesi et al. (2024) evaluated Nigeria's mandatory continuing professional-development programme for primary-school teachers using mixed methods. The authors reported perceived gains in professional competence and exchange of ideas among programme participants. Their findings support continued investment in teacher professional development, but the programme-level focus leaves open the question of how school leadership and day-to-day collaborative learning support continuing participation after formal training.

Huijboom et al. (2023) conducted a longitudinal cross-case investigation of seven PLCs in Dutch secondary schools using questionnaires, interviews and observations. They found that proactive leadership, facilitation, purposeful dialogue and organised meetings supported PLC development. Van den Boom-Muilenburg et al. (2023) reached a related conclusion in their study of sustainable data-use PLCs, showing that both formal and

informal leadership practices supported the embedding of collaborative routines. These studies clarify how leadership can shape PLC conditions, although they did not examine Nigerian CPD participation.

Nguyen et al. (2024) reviewed 70 empirical studies of teacher PLCs in the Global South and concluded that leadership support, organisational readiness, attention to teaching and learning, and trusting professional relationships were recurring conditions for productive PLCs. Their synthesis is especially relevant because it places PLC research in settings that share resource and organisational constraints with many Nigerian schools. However, the review also highlighted the need for stronger and more diverse empirical evidence across Global South contexts.

Zhang et al. (2023), using responses from 878 Chinese principals, found that shared purpose, collective focus on student learning and reflective dialogue significantly mediated associations between leadership practices and teacher collective efficacy. Liu and Hallinger (2024), drawing on 3,374 teacher responses, also established direct and indirect relationships connecting instructional leadership with PLC development. More recently, Gu et al. (2025) reported that multiple leadership practices were positively related to PLCs and that perceived trust significantly mediated these relationships. Collectively, these studies support statistical mediation processes but use outcomes and educational contexts that differ from teachers' CPD participation in Nigerian public senior secondary schools.

The reviewed literature therefore supports three propositions: leadership behaviour is associated with teacher professional development; leadership practices are associated with PLC formation and participation; and PLCs can form part of indirect statistical pathways connecting leadership with teacher outcomes. However, limited empirical evidence addresses the specific pathway from educational leadership behaviour through PLC participation to teachers' CPD participation in the FCT. The present study addressed this contextual and analytical gap.

3. METHODOLOGY

3.1 Research Design

The study adopted a cross-sectional descriptive-correlational survey design. The design enabled the researcher to estimate relationships among educational leadership behaviour, teachers' participation in professional learning communities and teachers' participation in continuous professional development without manipulating the variables. It also supported regression-based estimation of the indirect association between leadership behaviour and CPD participation through PLC participation. The mediation findings are interpreted as statistical associations because the cross-sectional design does not establish temporal precedence.

3.2 Area of the Study

The study was conducted in public senior secondary schools across the six Area Councils of the Federal Capital Territory, Abuja: Abaji, Abuja Municipal, Bwari, Gwagwalada, Kuje and Kwali.

3.3 Population of the Study

The population comprised full-time classroom teachers employed in the 88 public senior secondary schools administered by the FCT Secondary Education Board. Administrative records indicated a teacher workforce above 5,000. Principals, non-teaching staff, temporary teachers and teachers who had spent less than one academic session in their schools were excluded because the study required respondents to have sufficient experience of their school's leadership and professional-learning practices.

3.3.1 Inclusion Criteria

The study included full-time classroom teachers in public senior secondary schools within the Federal Capital Territory, Abuja, who had spent at least one academic session in their current schools and had direct experience with school leadership practices, professional learning activities, and continuous professional development programmes.

3.3.2 Exclusion Criteria

The study excluded principals, vice-principals, non-teaching staff, temporary teachers, and teachers who had served for less than one academic session in their current schools because they were considered unlikely to have sufficient exposure to the leadership practices and professional learning processes examined in the study.

3.4 Sample size and Sampling Procedure

3.4.1 Sample Size

Thirty per cent of the 88 public senior secondary schools was selected, producing 26.4 schools, which was rounded upward to 27. For teacher participation, the study targeted at least 361 usable responses, a size that provides approximately a 95% confidence level and a .05 margin of error for a finite population of this order under conservative proportion assumptions. To compensate for non-response and unusable questionnaires, 402 copies of the instrument were administered. A total of 361 usable questionnaires were obtained, representing an 89.8% usable-response rate.

3.4.2 Sampling Procedure

A multistage sampling procedure was used. First, the 88 schools were stratified by the six Area Councils. Second, the 27 participating schools were allocated proportionately across the Area Councils and selected through simple random sampling. Third, the number of teachers selected from each school was determined proportionately from the school's

eligible teaching staff. Finally, eligible teachers were selected from staff lists through simple random sampling.

3.5 Instrument for Data Collection

Data were collected using a researcher-developed instrument titled the Leadership Behaviour, Professional Learning Communities and Teachers' Continuous Professional Development Participation Questionnaire (LBPLC-TCPDPQ). Section A elicited demographic and professional information, including gender, educational qualification, teaching experience, Area Council and school location. Section B measured educational leadership behaviour through items on instructional guidance, shared vision, professional support, distributed responsibility, feedback, trust and resource provision. Section C measured participation in PLCs through collaborative planning, reflective dialogue, peer learning, collective inquiry and knowledge sharing. Section D assessed participation in CPD through workshops, mentoring, professional reading, action research, digital learning and collaborative lesson development.

The substantive items used a four-point response format. Leadership-behaviour items were rated Strongly Agree (4), Agree (3), Disagree (2) and Strongly Disagree (1). PLC and CPD participation items were rated Very Frequently (4), Frequently (3), Rarely (2) and Never (1). Higher composite scores represented stronger perceived educational leadership behaviour and greater participation in PLC and CPD activities.

3.5.1 Validity of the Instrument

Three specialists in Educational Management, Measurement and Evaluation, and Educational Research reviewed the instrument for face and content validity. They assessed the relevance, clarity, representativeness and alignment of items with the study objectives and constructs. Their ratings were collated using the Scale-Level Content Validity Index based on average agreement (S-CVI/Ave), with .80 adopted as the decision criterion. Items that did not meet the experts' recommendations for relevance or clarity were revised or removed before pilot testing.

3.5.2 Reliability of the Instrument

The revised questionnaire was pilot-tested with 30 public senior secondary school teachers from schools excluded from the main study. Cronbach's alpha was used to assess the internal consistency of the educational leadership behaviour, PLC participation and CPD participation scales, with .70 adopted as the minimum acceptable criterion.

3.6 Data-Collection Procedure

Approval was obtained from the relevant research authority and the FCT Secondary Education Board, after which permission was secured from principals of the selected schools. The researcher and trained research assistants administered the questionnaires directly to sampled teachers. Participants received information about the purpose of the

study, voluntary participation, confidentiality and the right to withdraw without penalty. The instrument did not request names, staff numbers or other direct identifiers. Completed questionnaires were retrieved, screened and prepared for analysis.

3.7 Method of Data Analysis

Data were screened for missing values, entry errors, outliers, normality, linearity, homoscedasticity and multicollinearity. Frequencies and percentages described respondents' characteristics, while means and standard deviations summarised the three principal constructs. Mean scores were interpreted as 3.25–4.00 (very high), 2.50–3.24 (high), 1.75–2.49 (low) and 1.00–1.74 (very low).

Pearson product-moment correlation and simple linear regression were used to answer the first three research questions and test the corresponding hypotheses. The fourth research question was addressed with a regression-based mediation model in which educational leadership behaviour served as the predictor, PLC participation as the mediator and CPD participation as the outcome. The indirect effect was estimated from 10,000 bootstrap resamples with a 95% confidence interval. Statistical mediation was supported where the confidence interval for the indirect effect excluded zero. Gender, educational qualification, teaching experience and school location were entered as covariates. All hypotheses were tested at the .05 level of significance.

3.8 Ethical Considerations

Participation was voluntary and based on informed consent. Confidentiality and anonymity were maintained throughout data collection and analysis. Completed questionnaires were securely stored, electronic data were password-protected, and findings were reported in aggregate form to reduce the possibility of identifying individual teachers or participating schools.

4. RESULTS

4.1 Analysis of Research Questions

The analysis was based on 361 usable responses ($N = 361$). Descriptive statistics and Pearson product-moment correlations were first used to examine the relationships specified in the research questions.

Research Question 1

What relationship existed between educational leadership behaviour and teachers' participation in continuous professional development?

Table 1

Descriptive Statistics and Correlation Between Educational Leadership Behaviour and CPD Participation

Construct	Items	M	SD	Level	r	p
Educational leadership behaviour (ELB)	B1–B16	3.12	0.48	High	.48	< .001
CPD participation	D1–D16	2.98	0.51	High	—	—

Note. ELB = educational leadership behaviour; CPD = continuous professional development. Items refer to Sections B and D of the LBPLC-TCPDPQ. N = 361.

Teachers perceived educational leadership behaviour as high (M = 3.12, SD = 0.48) and reported a high level of CPD participation (M = 2.98, SD = 0.51). A statistically significant moderate positive relationship existed between the two constructs, $r(359) = .48$, $p < .001$. Thus, higher perceived educational leadership behaviour was associated with greater teacher participation in CPD.

Research Question 2

What relationship existed between educational leadership behaviour and teachers' participation in professional learning communities?

Table 2

Descriptive Statistics and Correlation Between Educational Leadership Behaviour and PLC Participation

Construct	Items	M	SD	Level	r	p
Educational leadership behaviour (ELB)	B1-B16	3.12	0.48	High	.61	< .001
PLC participation	C1-C16	3.05	0.54	High	—	—

Note. ELB = educational leadership behaviour; PLC = professional learning communities. Items refer to Sections B and C of the LBPLC-TCPDPQ. N = 361.

Teachers reported a high level of PLC participation ($M = 3.05$, $SD = 0.54$). Educational leadership behaviour had a statistically significant strong positive relationship with PLC participation, $r(359) = .61$, $p < .001$. The result indicates that stronger perceived leadership behaviour was associated with more frequent teacher participation in collaborative professional-learning activities.

Research Question 3

What relationship existed between teachers' participation in professional learning communities and their participation in continuous professional development?

Table 3

Descriptive Statistics and Correlation Between PLC Participation and CPD Participation

Construct	Items	M	SD	Level	r	p
PLC participation	C1–C16	3.05	0.54	High	.65	< .001
CPD participation	D1–D16	2.98	0.51	High	—	—

Note. PLC = professional learning communities; CPD = continuous professional development. Items refer to Sections C and D of the LBPLC-TCPDPQ. N = 361.

A statistically significant strong positive relationship existed between PLC participation and CPD participation, $r(359) = .65$, $p < .001$. Teachers who reported more frequent collaborative planning, peer learning and reflective professional activity also reported greater participation in CPD.

Research Question 4

To what extent did professional learning communities statistically mediate the relationship between educational leadership behaviour and teachers' participation in continuous professional development?

Table 4

Decomposition of the Total Standardised Effect of Educational Leadership Behaviour on CPD Participation

Effect pathway	β	Percentage of total effect
Total effect (ELB $\rightarrow$ CPD)	.480	100.0%
Direct effect (ELB $\rightarrow$ CPD, controlling for PLC)	.135	28.1%
Indirect effect (ELB $\rightarrow$ PLC $\rightarrow$ CPD)	.345	71.9%

Note. ELB = educational leadership behaviour; PLC = professional learning communities; CPD = continuous professional development. Estimates are standardised.

PLC participation accounted for 71.9% of the total standardised modelled effect of educational leadership behaviour on CPD participation, while the residual direct effect accounted for 28.1%. The decomposition indicates that the larger share of the observed leadership–CPD association was represented by the indirect pathway through PLC participation.

Hypothesis Testing

The four null hypotheses were tested at the .05 level of significance. Simple linear regression was used for the first three hypotheses. The fourth hypothesis was tested with a bootstrapped mediation model controlling for gender, educational qualification, teaching experience and school location.

Hypothesis 1

H₀₁: There is no significant relationship between educational leadership behaviour and teachers' participation in continuous professional development.

Table 5

Simple Linear Regression Predicting CPD Participation From Educational Leadership Behaviour

Predictor	B	SE	β	t	p
Constant	1.38	0.16	—	8.62	< .001
Educational leadership behaviour	0.51	0.05	.48	10.35	< .001

Note. Dependent variable = CPD participation. N = 361. $R^2 = .230$. $F(1, 359) = 107.24$, $p < .001$.

Educational leadership behaviour significantly predicted CPD participation, $B = 0.51$, $SE = 0.05$, $\beta = .48$, $t(359) = 10.35$, $p < .001$. The regression model was statistically significant, $F(1, 359) = 107.24$, $p < .001$, and explained 23.0% of the variance in CPD participation ($R^2 = .230$). H_{01} was therefore rejected.

Hypothesis 2

H₀₂: There was **is** no significant relationship between educational leadership behaviour and teachers' participation in professional learning communities.

Table 6

Simple Linear Regression Predicting PLC Participation From Educational Leadership Behaviour

Predictor	B	SE	β	t	p
Constant	0.91	0.15	—	6.06	< .001
Educational leadership behaviour	0.68	0.04	.61	14.58	< .001

Note. Dependent variable = PLC participation. N = 361. $R^2 = .372$. $F(1, 359) = 212.65$, $p < .001$.

Educational leadership behaviour significantly predicted PLC participation, $B = 0.68$, $SE = 0.04$, $\beta = .61$, $t(359) = 14.58$, $p < .001$. The model was statistically significant, $F(1, 359) = 212.65$, $p < .001$, and accounted for 37.2% of the variance in PLC participation ($R^2 = .372$). H_{02} was therefore rejected.

Hypothesis 3

H₀₃: There was **is** no significant relationship between teachers' participation in professional learning communities and their participation in continuous professional development.

Table 7

Simple Linear Regression Predicting CPD Participation From PLC Participation

Predictor	B	SE	β	t	p
Constant	1.11	0.12	—	9.25	< .001
PLC participation	0.61	0.03	.65	16.19	< .001

Note. Dependent variable = CPD participation. $N = 361$. $R^2 = .422$. $F(1, 359) = 262.18$, $p < .001$.

PLC participation significantly predicted CPD participation, $B = 0.61$, $SE = 0.03$, $\beta = .65$, $t(359) = 16.19$, $p < .001$. The model was statistically significant, $F(1, 359) = 262.18$, $p < .001$, and explained 42.2% of the variance in CPD participation ($R^2 = .422$). Accordingly, H_{03} was rejected.

Hypothesis 4

H₀₄: Professional learning communities did not significantly mediate the relationship between educational leadership behaviour and teachers' participation in continuous professional development.

Table 8

Mediation Analysis of the Indirect Effect of Educational Leadership Behaviour on CPD Participation Through PLC Participation

Effect path	B	SE	t	p	LLCI	ULCI
Path a: ELB → PLC	0.68	0.04	14.58	< .001	0.59	0.77
Path b: PLC → CPD	0.52	0.04	12.85	< .001	0.44	0.60
Direct effect (c')	0.14	0.05	2.80	.005	0.04	0.24
Indirect effect (a × b)	0.35	0.04	—	—	0.27	0.43

Note. Unstandardised coefficients are reported. LLCI = lower limit of the 95% confidence interval; ULCI = upper limit. The indirect effect was estimated from 10,000 bootstrap resamples. The model controlled for gender, educational qualification, teaching experience and school location.

The indirect effect of educational leadership behaviour on CPD participation through PLC participation was statistically significant, $B = 0.35$, $SE = 0.04$, 95% bootstrap CI [0.27, 0.43]. Because the confidence interval excluded zero, H_{04} was rejected. The direct effect remained significant after PLC participation entered the model, $B = 0.14$, $SE = 0.05$, $t = 2.80$, $p = .005$. The pattern therefore supported partial statistical mediation: educational leadership behaviour retained a direct association with CPD participation, while a larger indirect association was represented through PLC participation.

4.2 Discussion of Findings

The first finding showed a significant moderate positive relationship between educational leadership behaviour and teachers' CPD participation, with leadership behaviour explaining 23.0% of the variance. This result supports Nigerian evidence that principals' instructional and professional-learning practices are associated with teacher development. He et al. (2024) demonstrated a strong predictive relationship between instructional leadership and teacher professional development in Anambra State, while Ajaegbu et al.

(2025) identified leadership support among the factors associated with professional-development participation in Lagos public secondary schools. The present finding therefore strengthens the view that teachers participate more actively in professional learning when school leaders communicate instructional direction, provide support, offer feedback and allocate resources for development.

However, the 23.0% explained variance also indicates that leadership behaviour alone does not account for most differences in CPD participation. This interpretation accords with Abenu and Alfa Yusufu's (2024) identification of funding, programme organisation, appraisal and responsiveness to teacher needs as constraints on professional development in the FCT. It also aligns with Osiesi et al. (2024), who showed that programme structures and opportunities for professional exchange matter to teachers' perceived development. Consequently, educational management interventions should avoid treating principal support as a substitute for funding, relevant programme design and access to appropriate learning opportunities.

The second finding established a strong positive relationship between educational leadership behaviour and PLC participation, with leadership behaviour accounting for 37.2% of the variance. This result is consistent with contemporary PLC scholarship. Huijboom et al. (2023) showed that proactive leadership, facilitation, purposeful dialogue and organised meetings supported PLC development. Van den Boom-Muilenburg et al. (2023) similarly found that sustaining collaborative professional routines required active leadership practices, while Nguyen et al. (2024) identified strong leadership support as a recurring condition across Global South PLC research. The FCT finding therefore suggests that collaborative professional learning is more likely to become regular school practice when leaders organise time, participation, trust and professional direction in deliberate ways.

The third finding showed that PLC participation significantly predicted CPD participation and explained 42.2% of its variance, the strongest of the three direct predictive models. This result supports the conception of PLCs as an important form of continuing teacher learning instead of merely an adjunct to externally organised workshops. Nguyen et al. (2024) reported that authentic PLC participation can support collaborative professional learning and professional efficacy, while Jin et al. (2024) found that online professional communities can expand collaboration, knowledge sharing and flexible participation. Grimm (2024) further drew attention to teacher-led professional conversations directed towards teaching improvement. Accordingly, collaborative planning, peer learning, reflective dialogue and collective inquiry can broaden CPD by locating professional learning in teachers' regular instructional work.

The mediation analysis provides the most important contribution of the study. PLC participation represented 71.9% of the total standardised modelled effect linking educational leadership behaviour with CPD participation, while the direct effect remained statistically significant. This pattern extends previous mediation research. Zhang et al. (2023) found that PLC dimensions mediated associations between leadership practices and teacher collective efficacy, and Liu and Hallinger (2024) reported indirect relationships linking instructional leadership with PLC development. Gu et al. (2025) similarly showed that relational processes can mediate associations between leadership practices and PLCs. The present study adds Nigerian evidence by showing that teachers' participation in PLCs can represent a substantial part of the statistical connection between leadership behaviour and continuing professional-development participation.

The finding should, however, be interpreted with methodological restraint. A cross-sectional mediation model cannot establish that leadership behaviour occurred first, PLC participation followed, and CPD participation subsequently changed. The estimates show that the observed covariance pattern is consistent with the proposed indirect model. Longitudinal or multilevel research would provide a stronger basis for testing temporal ordering and school-level processes. Even with this limitation, the size of the indirect association suggests that educational leadership and CPD should be connected through formal collaborative structures rather than managed as separate school functions.

Implications for Educational Management and Policy

The findings have direct implications for educational management in the FCT. First, leadership development for principals should include the design and facilitation of collaborative professional learning, not only administrative supervision. Principals require practical capacity to schedule PLC meetings, guide instructional inquiry, support teacher facilitators, protect collaborative time and connect professional learning with evidence from classroom practice. Contemporary studies show that leadership practices influence the quality and sustainability of collaborative teacher learning (Gu et al., 2025; Huijboom et al., 2023; van den Boom-Muilenburg et al., 2023).

Second, the FCT Secondary Education Board should treat PLC participation as part of the CPD architecture for public senior secondary schools. External workshops remain useful, but their value can be extended through school-based follow-up. Teachers who attend external programmes can share resources, demonstrate new practices, discuss implementation problems and examine evidence of instructional change with colleagues. Such a structure would address the gap between access to professional development and sustained application identified in FCT research (Abenu & Alfa Yusufu, 2024).

Third, policy monitoring should move beyond attendance records. Evaluation can examine the regularity of PLC meetings, teacher participation, the quality of professional dialogue,

follow-up after training, evidence of collaborative lesson development and reported changes in classroom practice. This approach would connect leadership accountability with the organisational conditions that support continuing professional learning.

Limitations and Directions for Further Research

Four limitations should guide interpretation. First, the cross-sectional design prevents strong claims about temporal sequence or causation. Second, leadership behaviour, PLC participation and CPD participation were measured through teacher self-report in the same questionnaire, so common-method effects may have strengthened observed associations. Third, teachers were nested in 27 schools, but the reported analysis used single-level correlation and regression; future research should estimate school-level variation through multilevel modelling where the number of schools and intraclass correlations permit it. Fourth, the study focused on public senior secondary schools in the FCT, which limits generalisation to private schools, junior secondary schools and other Nigerian states.

Further research should therefore employ longitudinal designs that measure leadership behaviour, PLC participation and CPD participation at different time points. Multilevel studies can separate teacher-level and school-level relationships, while mixed-method research can examine how principals and teacher leaders organise PLC routines in schools with high and low CPD participation. Comparative studies across Nigerian states can also test whether the indirect PLC pathway remains stable under different policy, funding and school conditions.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The study concluded that educational leadership behaviour is positively associated with teachers' participation in continuous professional development among public senior secondary school teachers in the FCT. Leadership behaviour was also strongly associated with PLC participation, while PLC participation showed the strongest direct relationship with CPD participation. Most importantly, PLC participation statistically mediated a substantial proportion of the leadership–CPD association, with the direct relationship remaining significant. Thus, the findings support an educational-management approach in which principals promote teacher development not only by encouraging attendance at professional programmes but also by establishing regular structures for collaborative inquiry, peer learning, reflective dialogue and follow-up of new instructional practices.

5.2 Recommendations

1. Principals should formally incorporate professional learning communities into school operations by protecting scheduled periods for collaborative lesson planning, peer observation, reflective dialogue, assessment review and collective inquiry into instructional problems.
2. School leaders should conduct systematic professional-learning needs assessments using classroom observation, appraisal evidence, learner-performance information and teachers' self-assessments, and CPD activities should be aligned with the identified needs.
3. Distributed facilitation should be strengthened by preparing heads of departments, subject coordinators and experienced teachers to lead mentoring, coaching, peer learning and follow-up after externally organised training.
4. The FCT Secondary Education Board should include PLC development in leadership policy and principal-performance review, with indicators covering regularity of collaborative learning, teacher participation, professional dialogue, instructional application and provision of time and resources.
5. School and system budgets should provide dedicated support for collaborative professional learning, including instructional materials, digital resources and appropriate meeting arrangements, so that CPD does not depend mainly on occasional externally funded programmes.
6. Monitoring and evaluation should extend beyond attendance records to evidence of changes in lesson planning, instructional practice, assessment, professional collaboration and responses to learners' needs.
7. External training should be connected with school-based follow-up. Teachers who attend workshops, seminars or conferences should receive structured opportunities to share learning, demonstrate relevant practices and collaborate on implementation with colleagues.
8. Further studies should replicate the model in private schools, junior secondary schools and other Nigerian states and should use longitudinal and multilevel designs to test temporal and school-level relationships more rigorously.

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