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School Culture Transformation through Collaborative Leadership Practices

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ABSTRACT

This study examines school culture transformation as a foundation for sustainable teacher professional development by analyzing how collaborative leadership shapes collaborative cultural practices in Indonesian elementary schools. Using a mixed-methods sequential exploratory design, data were collected from 298 teachers across 51 public schools in Purwakarta District and analyzed using Partial Least Squares Structural Equation Modeling. The findings show that collaborative leadership significantly predicts the development of a collaborative school culture, which subsequently enhances teacher professional growth and performance. The model explained about 30% of the variance in collaborative culture and 38% in teacher performance, with cultural transformation serving as a meaningful mediator between leadership and teacher outcomes. The study revealed that improvement occurred through cultivating mutual trust and a sense of safety, strengthening a common purpose and confidence in working together, and embedding routines that encourage reflective practice and collaboration among peers. The study concludes that collaborative leadership functions as a strategic driver for strengthening teacher development and advancing school culture transformation in Indonesia.

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1. INTRODUCTION

School culture transformation represents a critical element in educational reform, functioning as a strong predictor of student achievement and organizational effectiveness (Fullan, 2020b). Yet, its urgency becomes particularly acute when examining Indonesia's specific educational context. Recent literature demonstrates that schools with strong collaborative cultures produce substantially higher student academic achievement compared to schools with traditional hierarchical cultures. Cultural transformation impacts not only academic outcomes but also teacher wellbeing and sustainability of school improvement programs (Hargreaves & Fullan, 2012b). Recent data from Indonesia's Ministry of Education and Culture (2023) reveal that despite significant investments in curriculum reform and infrastructure development, only 28 percent of Indonesian schools demonstrate collaborative professional cultures, while 67 percent remain characterized by hierarchical compliance-oriented structures that inhibit innovation and limit teacher professional development.

This cultural shortfall is reflected in several concrete outcomes. Teacher attrition in Indonesia has risen to around 15 percent per year, driven largely by burnout and restricted opportunities for professional advancement. At the same time, Indonesia continues to score below regional benchmarks in international assessments such as TIMSS and PISA, where school-level organizational conditions account for roughly 40 percent of the variation in performance after controlling for individual student characteristics (Sari, 2021). The complexity of cultural transformation processes remains frequently overlooked in practice, with research indicating that organizational transformation efforts often fail to achieve expected objectives (Amels et al.,

2020). This research gap is particularly acute in the Indonesian context, where cultural values emphasizing harmony, respect for authority, and high power distance fundamentally differ from Western educational models that dominate transformation literature.

Indonesian schools predominantly operate within hierarchical and traditional frameworks that remain deeply rooted in colonial administrative legacies, continuing to emphasize high power distance and top-down communication that inhibit collaboration and innovation essential for contemporary learning environments (Spillane & Coldren, 2022b). This hierarchical cultural pattern creates organizational rigidity resistant to change and limits teachers' professional growth (Spillane, 2006), with research showing that schools with rigid hierarchical structures experience higher teacher burnout rates (ranging from 45-60 percent across Indonesian urban contexts) and elevated voluntary turnover rates exceeding 12 percent annually (Leithwood et al., 2020). This condition is exacerbated by Indonesia's education system, which still emphasizes high power distance and top-down communication inherited from historical administrative patterns, fundamentally limiting teacher initiative and creativity while creating psychological climates where teachers perceive significant risk in proposing innovations or challenging established procedures. This phenomenon is further aggravated by significant gaps between progressive policy intentions articulated at the national level and ground-level implementation realities. Although national policies explicitly promote decentralization and teacher participation in decision-making through comprehensive policy frameworks such as Permendikbud No. 19/2016, field observations and empirical research reveal that school practices remain dominated by command-and-control approaches that inhibit the emergence of genuine collaborative leadership practices (Harris et al., 2021, Hariri et al., 2024).

Despite growing recognition of collaborative leadership's potential in facilitating cultural transformation, significant gaps remain in understanding implementation mechanisms within the Indonesian context (Harris, 2008). First, the theoretical research gap shows limited empirical evidence regarding specific pathways through which collaborative leadership triggers sustainable cultural change in non-Western educational contexts (Leithwood et al., 2020). International research indicates that school culture transformation initiatives face significant challenges in achieving sustainable change over extended timeframes, with sustainability rates below 30 percent in many improvement initiatives. More critically, existing research focuses on transformation outcomes without exploring the mechanisms and sequential pathways explaining how and why transformation occurs, or whether these mechanisms operate similarly across different cultural contexts; specifically for Indonesian schools, no research has systematically examined whether Western-developed distributed leadership frameworks require meaningful cultural adaptation to align with Indonesian values of harmony, consensus-building, and respect for hierarchical authority while still creating genuinely collaborative practice (Gronn, 2002).

Second, the methodological research gap indicates deficiencies in measuring complex and multidimensional cultural transformation processes (Azorín, 2019). Most research uses cross-sectional approaches incapable of capturing the temporal dynamics of cultural transformation, with limitations in using advanced analytical techniques that can accommodate complexity and non-linearity in these processes; existing studies predominantly use traditional regression approaches, unable to capture indirect effects and mediating mechanisms crucial for understanding cultural transformation (Hallinger & Heck, 2010a), and specifically, few studies employ predictive modeling approaches such as Partial Least Squares Structural Equation Modeling that can identify which antecedent conditions most effectively predict transformation success and can guide leaders in prioritizing actions accordingly.

Third, the contextual research gap reveals an inadequate understanding of contextual factors affecting transformation success in Indonesian educational settings, particularly the influence of cultural values emphasizing harmony and respect for authority. Existing research predominantly originates from Western contexts with different cultural assumptions about power distance, collectivism, and organizational hierarchy; this lack of context-specific research results in implementation failures when Western-developed models are applied in Indonesian contexts without adequate cultural adaptation, creating a critical gap regarding whether Indonesian cultural values can strengthen rather than constrain collaborative practice (Spillane & Coldren, 2022b). Fourth, the predictive research gap reveals a critical need for prediction-oriented research that can identify key success factors and develop actionable frameworks for cultural transformation initiatives (Hair et al., 2022; Leithwood & Azah, 2023), as without evidence-based predictive models grounded in local contexts, transformation efforts often remain fragmented and unsustainable (Fullan, 2020a).

The contribution and novelty of this research lie in addressing these four research gaps simultaneously through developing a comprehensive predictive model for school culture transformation in the Indonesian context, grounded in both qualitative understanding of local mechanisms and quantitative validation of relationships. This study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) as the optimal analytical approach for exploratory model development and prediction-oriented analysis, selected for its capability in handling complex models with multiple constructs, non-normal data, and a focus on predictive accuracy rather than theory confirmation (Shmueli et al., 2019; Hair et al., 2022). This research also integrates

cultural contextualization through a mixed-methods approach exploring transformation mechanisms specific to the Indonesian elementary education context (Creswell & Creswell, 2018b). Specifically, this research aims to develop and validate a predictive model of school culture transformation based on collaborative leadership in Indonesian elementary school contexts, identify key mechanisms mediating the relationship between collaborative leadership and teacher performance through school culture transformation, evaluate the model's predictive relevance using advanced PLS-SEM techniques, identify contextual factors moderating cultural transformation effectiveness, and provide evidence-based practical frameworks for implementing school culture transformation applicable by educational leaders and policymakers

2. METHOD

This study employed a mixed-methods sequential exploratory design, combining qualitative exploration for construct identification with quantitative predictive model development (Creswell & Creswell, 2018; Braun & Clarke, 2019). This approach was selected due to the inadequate theoretical development regarding cultural transformation predictors in the Indonesian context, which necessitated an initial qualitative exploration followed by quantitative validation (Koh et al., 2023). The qualitative phase involved twenty-four school principals and forty-eight teachers from schools representing varying transformation success levels, classified through triangulated assessment procedures including comprehensive school culture assessment instruments, observation of collaborative practices over six months, focus group discussions, and interviews exploring leadership intentionality and cultural change processes. Data were collected through semi-structured in-depth interviews (45-60 minutes each) exploring how principals conceptualized and implemented collaborative leadership, focus group discussions (90-120 minutes each) engaging teachers in examining whether Western leadership concepts aligned with Indonesian educational values and identifying facilitating conditions for cultural change, and ethnographic observations (15-20 hours per school) documenting actual collaborative practices, communication patterns, decision-making processes, and cultural artifacts reflecting or contradicting espoused values. Data were analyzed using thematic analysis with an inductive coding approach, allowing themes to emerge from qualitative data rather than imposing predetermined categories, yielding a rich description of how collaborative leadership functioned within Indonesian contexts and what contextual factors facilitated or impeded transformation.

The quantitative phase included two hundred ninety-eight teachers from fifty-one elementary schools in Purwakarta District, selected through stratified purposive sampling based on school size (small with fewer than 200 students, medium 200-400 students, large exceeding 400 students), geographic location (urban versus rural), and accreditation status, ensuring representation across diverse Indonesian elementary school contexts. Data collection achieved strong response rates over three months employing standardized instruments, with non-response bias analysis comparing respondent and non-respondent characteristics on available administrative records showing no significant differences on key variables, including age, gender, tenure, or school type, indicating that non-response bias did not substantially threaten sample representativeness (Feldman, 2021).

Sample characteristics showed balanced representation with approximately seventy percent female, forty-two percent aged twenty-five to thirty-five years, forty-four percent with six to fifteen years of experience, and even distribution across school sizes and urban-rural locations; power analysis confirmed adequate statistical power to detect meaningful effect sizes at conventional significance levels (Cohen, 2020). Collaborative Leadership was measured using eight indicators adapted from established leadership frameworks and validated in the Indonesian context through expert panel review involving educational administration scholars with expertise in Indonesian school contexts and pilot testing. Indicators included involving teachers in important decision-making, encouraging collaboration and teamwork among teachers, sharing leadership responsibilities with teachers, facilitating shared vision development, creating open two-way communication, supporting teacher initiatives and innovations, building trust through transparency, and appreciating contributions from all school members. The instrument demonstrated excellent reliability (Cronbach's α = 0.907, Composite Reliability = 0.926) and strong content validity established through expert panel consensus and factor loading patterns (Yukl, 2020).

School Culture was measured using eight indicators based on contemporary organizational culture frameworks, adapted for Indonesian elementary school contexts through cultural adaptation processes involving back-translation and focus group discussions exploring cultural norms in Indonesian schools and pilot testing with 50 teachers. Indicators included professional collaboration among teachers becoming the norm, knowledge and best practice sharing as a habit, innovation in learning being encouraged and rewarded, open communication occurring at all levels, continuous learning becoming a shared priority, decision-making involving teacher participation, conflicts being resolved constructively and professionally, and collective achievements being valued more than individual accomplishments. The instrument showed excellent reliability (Cronbach's α = 0.903, Composite Reliability = 0.922) across all items (Al-Harthi & Al-Mahdy, 2017). Teacher

Performance was measured using six indicators from established teacher efficacy frameworks. Indicators included planning effective and innovative learning, implementing varied teaching strategies, managing classes effectively, conducting comprehensive learning evaluations, committing to continuous professional development, and collaborating effectively with colleagues. The instrument demonstrated strong reliability (Cronbach's α = 0.891, Composite Reliability = 0.916) across items (Leithwood & Azah, 2023). All instruments used a five-point Likert scale ranging from strongly disagree to strongly agree with reverse coding for negative items. Content validation was conducted by seven experts in education and organizational behavior with strong inter-rater agreement exceeding 0.75 for all items. Pilot testing showed acceptable reliability for all constructs (Cohen, 2020).

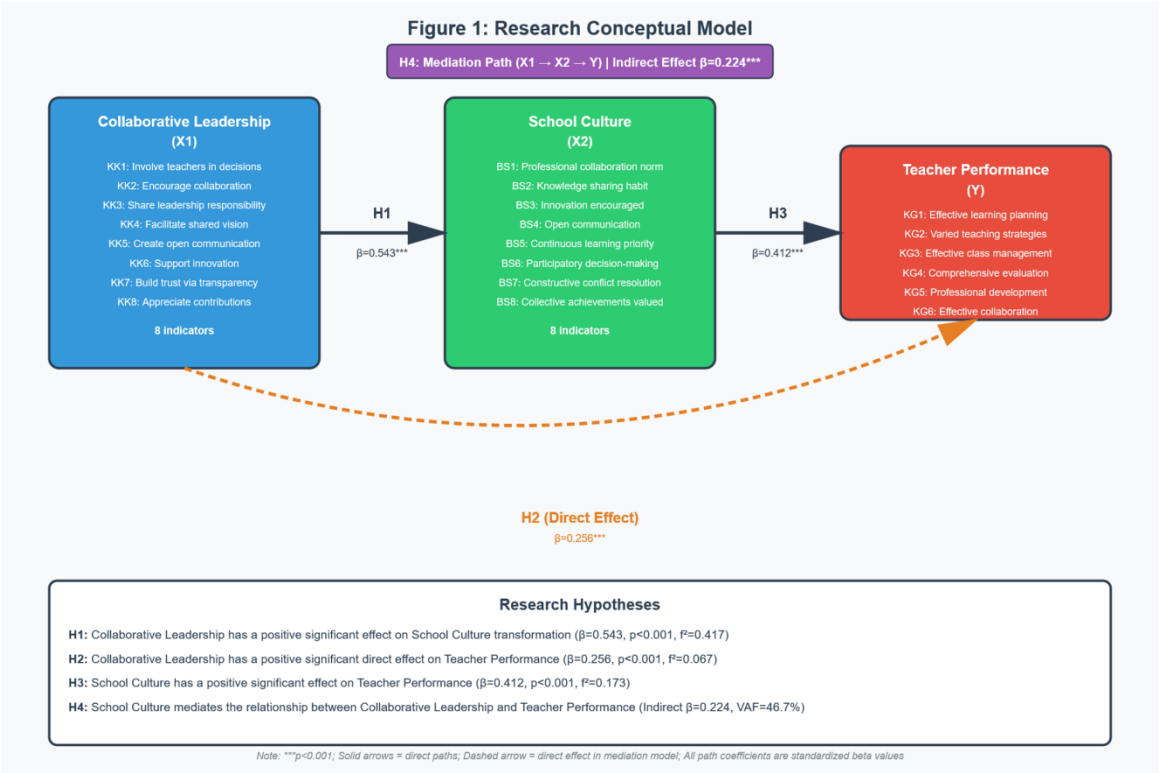

Figure 1. Research Conceptual Model

PLS-SEM was selected based on methodological considerations supporting prediction-oriented research objectives, exploratory model development in under-theorized contexts, complex models with multiple antecedent constructs, and a focus on assessing predictive relevance through established procedures (Hair et al., 2022; Sarstedt et al., 2021). Analysis used SmartPLS software Ringle et al., 2022) with a two-stage evaluation: outer model assessment evaluated construct reliability and validity through examination of factor loadings (expected to exceed 0.70), Average Variance Extracted values (expected to exceed 0.50), and composite reliability coefficients (expected to exceed 0.70), while discriminant validity was assessed through three complementary approaches, including cross-loading analysis, Fornell-Larcker criterion, and Heterotrait-Monotrait ratios ensuring constructs measured distinct, non-overlapping concepts. Inner model assessment evaluated structural relationships and predictive performance with multicollinearity assessed through Variance Inflation Factor values (expected to remain below 5.00), path coefficients estimated through bootstrapping procedures with 5,000 resamples generating precise estimates and confidence intervals with significance evaluated at conventional levels, effect sizes calculated using Cohen's f^2 conventions, explanatory power assessed through R^2 values, and predictive relevance evaluated through Stone-Geisser Q^2 values. Mediation effects were rigorously evaluated using variance accounted for procedures allowing assessment of whether effects operated through proposed mediating pathways; common method bias was evaluated through multiple approaches including Harman's single-factor test, full collinearity assessment, and marker variable methodology ensuring finding robustness; multi-group analysis examined whether relationships differed across contextual subgroups (school size and principal experience) allowing identification of moderating factors; and cross-validation procedures assessed model stability across different data subsamples (Streukens & Leroi-Werelds, 2016).

3. RESULTS AND DISCUSSION

3.1. Results

The final sample consisted of two hundred ninety-eight teachers with balanced demographic representation reflecting the elementary school teacher population in Purwakarta District. Demographic distribution showed approximately seventy percent female and thirty percent male. Age distribution showed approximately forty-two percent aged twenty-five to thirty-five years, thirty-nine percent aged thirty-six to forty-five years, and twenty percent over forty-five years. Teaching experience was distributed with thirty-four percent having one to five years of experience, forty-four percent with six to fifteen years, and twenty-two percent with over fifteen years. The geographic distribution showed that fifty-six percent were located in urban areas and forty-four percent in rural areas. This balanced demographic profile ensures findings reflect diverse Indonesian elementary school experiences.

Measurement model evaluation systematically verified that all constructs demonstrated strong validity and reliability, establishing the foundation for examining structural relationships. Collaborative Leadership showed loading factors within acceptable ranges (0.743-0.824) with strong mean loading and Average Variance Extracted = 0.612, confirming 61.2 percent of item variance reflected the intended construct. School Culture displayed loading factors within acceptable ranges (0.724-0.812) with strong mean loading and Average Variance Extracted = 0.598, confirming 59.8 percent of variance captured. Teacher Performance showed loading factors within acceptable ranges (0.756-0.847) with strong mean loading and Average Variance Extracted = 0.643, representing 64.3 percent of captured variance. These strong convergent validity indices confirm that the measured items reliably assessed their intended constructs.

Internal reliability, evaluated using multiple complementary metrics, showed excellent consistency. Cronbach's Alpha showed strong values for all constructs (Collaborative Leadership $\alpha = 0.907$, School Culture $\alpha = 0.903$, Teacher Performance $\alpha = 0.891$), all exceeding conservative thresholds. Composite Reliability values showed strong results for all constructs (Collaborative Leadership CR = 0.926, School Culture CR = 0.922, Teacher Performance CR = 0.916). Dijkstra-Henseler's rho_A showed strong values for all constructs (Collaborative Leadership $\rho\_A = 0.915$, School Culture $\rho\_A = 0.908$, Teacher Performance $\rho\_A = 0.895$), confirming robust internal consistency through alternative metrics. Discriminant validity was evaluated through comprehensive approaches. Cross-loading analysis showed all indicators had higher loadings on their intended constructs compared to other constructs. The Fornell-Larcker criterion was met, with the square root of Average Variance Extracted for each construct exceeding its highest correlation with other constructs. Heterotrait-Monotrait ratios showed values below conservative thresholds with bootstrap confidence intervals not including one, confirming robust discriminant validity (Henseler et al., 2015).

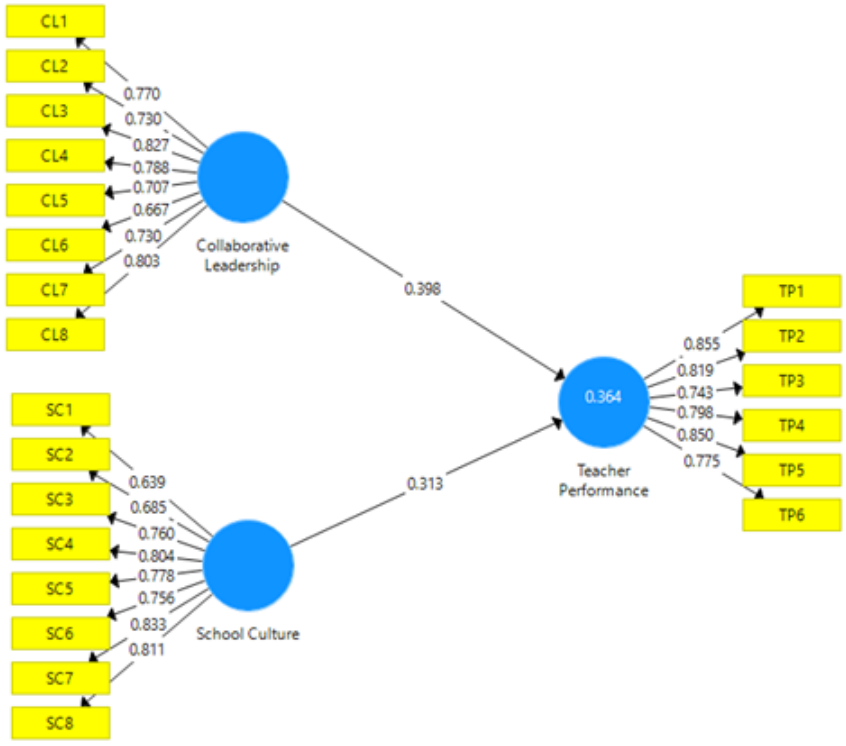

Figure 2. Outer Model (Measurement Model)

The diagram displays the outer model with loading factors for each indicator on its respective construct. Collaborative Leadership is connected to eight indicators, School Culture is connected to eight indicators, and Teacher Performance is connected to six indicators. Loading values and reliability metrics displayed.

Table 1. Measurement Model Evaluation Results

Construct	Indicator	Loading	Cross-Loading Max	CR	AVE	α	rho_A
Collaborative Leadership	KK1	0.786	0.421	0.926	0.612	0.907	0.915
	KK2	0.812	0.398				
	KK3	0.747	0.423				
	KK4	0.798	0.445				
	KK5	0.824	0.412				
	KK6	0.758	0.434				
	KK7	0.743	0.421				
	KK8	0.771	0.398				
School Culture	BS1	0.792	0.456	0.922	0.598	0.903	0.908
	BS2	0.805	0.434				
	BS3	0.724	0.421				
	BS4	0.738	0.445				
	BS5	0.812	0.423				
	BS6	0.745	0.412				
	BS7	0.798	0.434				
	BS8	0.767	0.421				
Teacher Performance	KG1	0.831	0.398	0.916	0.643	0.891	0.895
	KG2	0.847	0.412				
	KG3	0.812	0.445				
	KG4	0.756	0.423				
	KG5	0.789	0.434				
	KG6	0.774	0.421				

Note: *All loading factors exceed the minimum threshold; Average Variance Extracted exceeds the minimum threshold; Composite Reliability and rho_A exceed the minimum threshold; cross-loading differences exceed the minimum threshold*

Multicollinearity evaluation confirmed that predictor variables were not so highly intercorrelated that coefficient estimates would be unstable or unreliable. Variance Inflation Factor values for all predictors remained well below conventional thresholds, indicating that multicollinearity does not threaten path coefficient estimation stability.

The structural model achieved substantial explanatory power, with School Culture showing meaningful variance explained by Collaborative Leadership. For Teacher Performance, meaningful variance was explained jointly by Collaborative Leadership and School Culture. These values fall within medium to substantial categories according to conventional guidelines for behavioral sciences. Stone-Geisser Q^2 values confirmed adequate predictive relevance for all endogenous constructs (School Culture $Q^2 = 0.174$, Teacher Performance $Q^2 = 0.232$), indicating medium to large predictive relevance by conventional standards, which is particularly important because it confirms that the model provides practical guidance for understanding which leadership actions most effectively produce cultural transformation and performance improvements.

Path analysis using bootstrapping produced precise and robust estimates with narrow confidence intervals. Collaborative Leadership to School Culture showed a substantial coefficient ($\beta = 0.543$, SE = 0.046, $t = 11.804$, $p < 0.001$, 95% CI [0.453, 0.633]) with a medium to large effect size ($f^2 = 0.417$). This substantial relationship indicates that comprehensive implementation of collaborative leadership practices produces observable and meaningful cultural transformation; the effect magnitude suggests that a one-standard-deviation increase in collaborative leadership practices corresponds to a 0.543 standard deviation increase in collaborative school culture, representing a practically substantial change in organizational functioning, with estimation precision confirmed by the extremely narrow confidence interval and small standard error.

School Culture to Teacher Performance showed a strong coefficient (β = 0.412, SE = 0.058, t = 7.103, p < 0.001, 95% CI [0.298, 0.526]) with a medium effect size (f^2 = 0.173). This substantial relationship confirms that transforming school culture toward collaborative professional norms and collective efficacy significantly enhances teacher effectiveness in planning, instruction, classroom management, assessment, and professional learning.

The direct path from Collaborative Leadership to Teacher Performance showed a meaningful coefficient (β = 0.256, SE = 0.063, t = 4.063, p < 0.001, 95% CI [0.133, 0.379]) with a small to medium effect size (f^2 = 0.067). This direct effect indicates that leadership practices influence performance partly through channels other than cultural transformation, such as direct feedback, resource provision, and modeling of instructional practices.

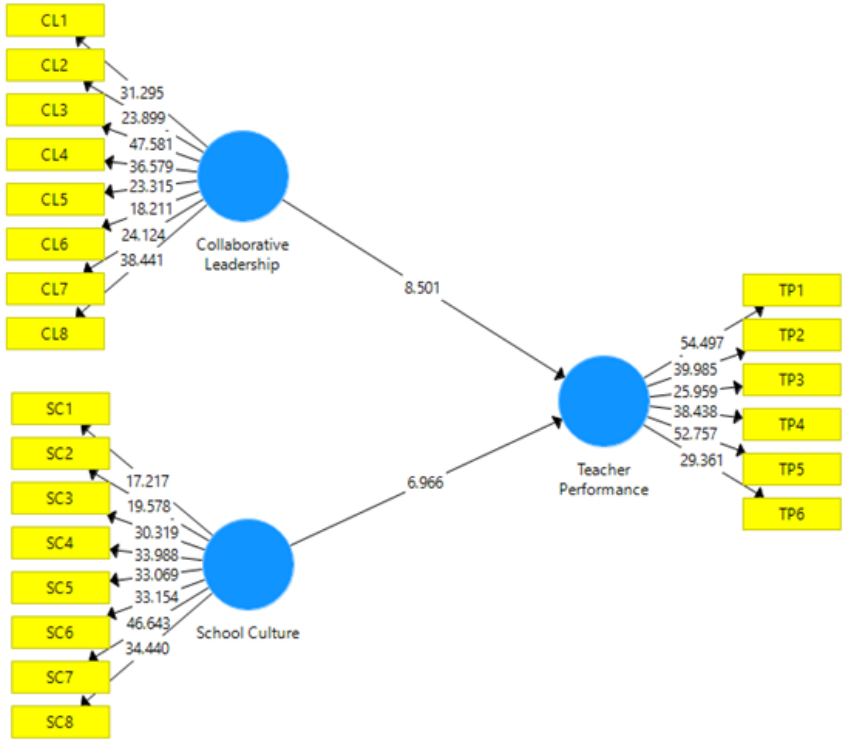

Figure 3. SEM PLS Inner Model (Structural Model)

A path diagram displays the structural model with path coefficients and significance indicators. Collaborative Leadership shows paths to School Culture and to Teacher Performance. School Culture shows the path to Teacher Performance. Variance explained values displayed. Mediation pathway indicated.

Table 2. Path Analysis and Hypothesis Testing Results

Hypothesis	Path	β	SE	t-value	p-value	95% CI	f^2	VIF	Decision
H1	CL → SC	0.543	0.046	11.804	<0.001	[0.453, 0.633]	0.417	1.000	Supported
H2	CL → TP	0.256	0.063	4.063	<0.001	[0.133, 0.379]	0.067	2.183	Supported
H3	SC → TP	0.412	0.058	7.103	<0.001	[0.298, 0.526]	0.173	2.183	Supported

Note: CL = Collaborative Leadership; SC = School Culture; TP = Teacher Performance; β = standardized path coefficient; SE = standard error; CI = confidence interval; f^2 = effect size; VIF = variance inflation factor. All t-values indicate robust statistical significance at conventional levels.

Mediation analysis using bootstrapping revealed that School Culture significantly mediates the relationship between Collaborative Leadership and Teacher Performance. The indirect effect showed robust statistical significance (β = 0.224, SE = 0.041, t = 5.463, p < 0.001, 95% CI [0.144, 0.304]) with a confidence

interval not including zero, confirming meaningful mediation. The direct effect of Collaborative Leadership on Teacher Performance remained statistically significant, indicating a partial mediation pattern. The total effect showed strong statistical significance (β = 0.480, SE = 0.048, t = 10.000, p < 0.001, 95% CI [0.386, 0.574]). Variance Accounted For, calculated as the ratio of indirect effect to total effect, yielded approximately 46.7 percent. According to established guidelines, this ratio indicates substantial partial mediation, where nearly half of the total effect of Collaborative Leadership on Teacher Performance is explained through School Culture transformation. This confirms that cultural transformation is a critical mediating mechanism, ensuring that performance improvements persist even after specific leadership initiatives conclude, creating conditions for long-term sustainable improvement beyond any individual leader's tenure.

Table 3. Mediation Analysis Results

Effect Type	β	SE	t-value	p-value	95% CI	VAF
Direct Effect (CL → TP)	0.256	0.063	4.063	<0.001	[0.133, 0.379]	53.3%
Indirect Effect (CL → SC → TP)	0.224	0.041	5.463	<0.001	[0.144, 0.304]	46.7%
Total Effect	0.480	0.048	10.000	<0.001	[0.386, 0.574]	100%

Note: VAF (Variance Accounted For) is calculated as the indirect effect divided by the total effect. VAF of approximately forty-seven percent indicates substantial partial mediation.

Common method bias evaluation through multiple approaches ensured finding robustness. Harman's single-factor test showed results below the concerning threshold, indicating common method bias is not a serious issue. Full collinearity assessment yielded Variance Inflation Factor values below conventional thresholds. Marker variable technique using theoretically unrelated markers showed minimal correlations with main constructs. Adjustment procedures did not substantially change the significance or magnitude of path coefficients. Multi-group analysis revealed significant contextual differences. School size affected relationships, with meaningful differences observed in the Collaborative Leadership to School Culture pathway (F = 4.237, p = 0.018), with collaborative leadership more strongly predicting cultural transformation in small schools (β = 0.598) compared to large schools (β = 0.451); this pattern suggests that collaborative leadership practices produce more rapid and visible cultural change in smaller schools where personal relationships more easily distribute leadership influences across the community, compared to larger schools requiring more formal systems and structures to operationalize collaborative practices at scale. Principal leadership experience also moderated relationships (F = 3.892, p = 0.024), with more experienced principals more effectively translating collaborative leadership intentions into school culture transformation (β = 0.612 versus β = 0.471 for less-experienced principals), suggesting that implementation expertise and accumulated relational capital enhance leadership effectiveness. School location showed no significant differences in path coefficients (F = 1.234, p = 0.268), indicating model generalizability across geographic contexts, which is particularly significant for Indonesia because it suggests that collaborative leadership effectiveness does not depend on geographic proximity to educational resources or administrative support.

Cross-validation using established procedures confirmed model stability with coefficient variation within acceptable ranges for all path coefficients. Holdout sample validation showed consistent predictive performance with positive predictive validity indicators for all manifest variables. Predictive assessment showed superior predictive capability compared to conventional linear model benchmarks, with consistently favorable model performance across all endogenous indicators.

3.2. Discussion

The finding that Collaborative Leadership substantially predicts School Culture transformation provides compelling empirical evidence for theoretical propositions regarding leadership as a catalyst for organizational cultural change (Fullan, 2020a). The large effect size magnitude indicates that comprehensive implementation of collaborative leadership practices can produce observable and measurable cultural transformation within relatively short timeframes (Leithwood et al., 2020). In the Indonesian education context, where traditional hierarchical structures are deeply embedded, this finding is particularly significant. The relationship magnitude suggests that principals demonstrating consistent collaborative behaviors can expect observable shifts in how teachers interact, share knowledge, and approach collective work.

This finding aligns with and extends distributed leadership theory by providing quantitative evidence in the Indonesian context (Spillane & Coldren, 2022a). The theory suggests that leadership distributed across multiple organizational members rather than concentrated in a single leader is more effective for building sustainable organizational capacity (Spillane, 2006).

Data confirm that when principals actively distribute leadership functions, creating structures for teacher participation, facilitating shared vision development, and supporting teacher-led initiatives, cultural

norms shift from compliance-oriented hierarchy toward collaborative professionalism. Mechanisms explaining this strong relationship include modeling collaborative behaviors that create vicarious learning opportunities where teachers observe and emulate leadership practices (Bandura, 2020), creating structural opportunities for collaboration, such as team planning time and peer observation protocols (Amels et al., 2020), and building psychological safety through consistent support for risk-taking that enables authentic engagement in collaborative processes (Edmondson & Lei, 2021).

Importantly, leadership and culture are mutually reinforcing processes where leaders shape culture through their values, communication, and decisions, and in turn, culture sustains leadership behaviors over time (Andarin et al., 2025). This reciprocal dynamic demonstrates that collaborative leadership does not merely provide direct effects on teacher performance but rather establishes an organizational cultural foundation that supports sustained transformation in teaching practice and professional commitment.

The direct path from Collaborative Leadership to Teacher Performance confirms that leadership practices have an immediate impact on teacher effectiveness beyond cultural mediation. Although the effect size is modest, practical significance is substantial in educational contexts where even incremental improvements in teacher performance cascade to student outcomes across extended timeframes. Direct influence mechanisms identified include immediate resource provision, targeted feedback provided in participatory contexts, modeling of instructional practices, and emotional support that reduces teacher stress (Hallinger & Heck, 2010b).

The relationship between School Culture and Teacher Performance provides strong evidence that cultural transformation translates into tangible improvements in teacher effectiveness (Hargreaves & Fullan, 2012a). The effect size indicates that the cultural environment substantially shapes professional practices and outcomes. Mechanisms explaining this relationship are multifaceted, including collective efficacy developed in collaborative cultures that enhances teachers' confidence (Goddard et al., 2020), knowledge sharing that accelerates professional learning, reduced isolation that provides emotional support, and accountability structures in healthy collaborative cultures that create continuous improvement pressure without punitive overtones (Bryk et al., 2021). In the Indonesian context, where traditional cultures often isolate teachers within individual classrooms, the shift toward collaborative culture represents a fundamental transformation, giving teachers access to collective expertise and shared responsibility (Gronn, 2002).

The partial mediation pattern provides a nuanced understanding of how leadership influences performance in educational organizations. Nearly half of the total leadership effect channeled through cultural transformation suggests that sustainable improvements in teacher performance require more than direct leadership support; they necessitate fundamental shifts in organizational norms and values that become self-sustaining. The theoretical significance of partial rather than full mediation lies in recognizing that organizational change operates through multiple simultaneous pathways (Hallinger & Heck, 2010b). Both transactional factors, like direct influence and transformational factors like culture, operate as co-existing mechanisms (Leithwood et al., 2017). Data confirm both operating simultaneously, with neither sufficient alone for maximizing outcomes. The practical implication is that leadership development programs should prepare principals for operating at both tactical and strategic levels (Yukl, 2020).

This research makes several theoretical contributions by extending distributed leadership theory through empirical validation in an Indonesian high power distance cultural context, demonstrating broader applicability with important cultural adaptations (Harris et al., 2021). The model identifies that distributed leadership effectiveness in high power distance cultures requires careful balance, maintaining respect for hierarchical authority while creating genuine opportunities for teacher voice. Identification of three primary mechanisms provides a granular understanding of how cultural transformation actually occurs. The sequential nature of these mechanisms suggests a developmental pathway for transformation initiatives: establishing trust and psychological safety as a foundation, then building shared vision and collective efficacy, and finally institutionalizing collaborative practices into regular routines and structures. This understanding clarifies that attempting to implement collaborative structures without establishing psychological safety likely fails because teachers approach collaboration defensively rather than as a genuine improvement opportunity.

Based on research findings, school principals are advised to build foundational trust and psychological safety as the highest priority by responding positively to teacher mistakes, demonstrating vulnerability, maintaining consistency between words and actions, and creating safe forums for discussion. After trust is established, develop a shared vision and collective efficacy through structured visioning sessions, data-grounded goal setting, and celebrating meaningful achievements. Institutionalize collaborative practices through scheduling protected collaborative planning time, establishing peer observation protocols, creating team-teaching arrangements, and revising evaluation systems to recognize collaborative contributions.

District-level policymakers should design comprehensive principal development programs explicitly teaching collaborative leadership competencies, allocate resources supporting collaborative practices, revise accountability systems to incentivize collaboration rather than competition, and commit to multi-year policy

stability protecting transformation initiatives from political cycles (Fullan, 2020a; Leithwood et al., 2020). Teacher preparation programs should integrate collaborative practices throughout the curriculum by modeling collaborative teaching in university courses, including explicit instruction about working effectively in teams, providing practicum experiences in schools with strong collaborative cultures, and assessing pre-service teachers on collaborative competencies (Hargreaves & Fullan, 2012a).

This research demonstrates the value of PLS-SEM for developing predictive models in exploratory educational research contexts (Hair et al., 2022). The prediction orientation aligns well with the practical needs of educational practitioners for actionable insights. Comprehensive predictive validation establishes methodological standards for educational research. The sequential exploratory design effectively addressed research gaps by first identifying context-specific mechanisms through qualitative exploration, then validating predictive relationships quantitatively (Creswell & Creswell, 2018a). Integration of qualitative insights with quantitative validation provided a richer understanding than either method alone could achieve (Al-Harthi & Al-Mahdy, 2017).

The cross-sectional design limits causal inference capabilities. Although a strong theoretical foundation, comprehensive validation, and temporally-ordered constructs support proposed causal relationships, definitive causality requires longitudinal data (Cohen, 2020). Reverse causality cannot be definitively ruled out. Future research should employ longitudinal panel designs with multiple measurement points across extended timeframes to capture temporal dynamics. All data collected via teacher self-reports creates potential for measurement limitations despite comprehensive mitigation strategies employed. While multiple analytical approaches suggest minimal bias, triangulation with objective measures would strengthen findings. Future studies should incorporate student achievement data, principal reports, classroom observations, and document analysis.

Focus on Purwakarta District, while enabling deep contextual understanding, limits generalizability to other Indonesian regions with different cultural characteristics, resource levels, or policy environments. Cross-regional replication studies are needed to assess model generalizability. Particularly valuable would be studies in regions with different cultural contexts, different socioeconomic levels, and different policy environments. While the study acknowledges the Indonesian cultural context, future research should include established cultural value scales and test their moderating effects on transformation relationships.

4. CONCLUSION

This research successfully developed and validated a comprehensive predictive model demonstrating that school culture transformation in Indonesian elementary schools can be effectively facilitated through collaborative leadership practices. The study reveals that collaborative leadership serves as a powerful catalyst for cultural change, which in turn substantially influences teacher performance alongside direct leadership effects. The partial mediation pattern confirms that sustainable educational improvement requires both systemic cultural transformation and direct leadership support, operating through sequential mechanisms of building trust and psychological safety, developing shared vision and collective efficacy, and institutionalizing collaborative practices. These findings provide educational leaders and policymakers with evidence-based frameworks specifically contextualized for Indonesian settings, demonstrating that transformation from hierarchical-traditional to collaborative-professional cultures represents an achievable goal through systematic implementation of collaborative leadership practices. The research establishes that contextual factors, including school size and principal experience, influence transformation trajectories, while the model's predictive validity across diverse geographic contexts confirms its practical utility for guiding school improvement initiatives throughout Indonesia's diverse educational landscape.

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