

Linking Principal Adaptive Leadership to Teacher Performance: The Mediating Effect of Collaborative School Culture

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Abstract

The exploration of teacher performance for the improvement of educational quality and student achievement is an important subject in Indonesia. Therefore, this research aimed to specifically explore the impact of principal adaptive leadership on teacher performance in the Indonesian educational landscape, with collaborative school culture serving as the mediating variable. To achieve the stated aim, data were collected through the administration of questionnaires from 425 public primary school teachers in West Java, Indonesia. Accordingly, the collected data were then analyzed using structural equation modeling with partial least squares (SEM-PLS). The results showed that adaptive leadership had a significant and positive influence on teacher performance. It was also observed that collaborative school culture acted as an effective mediating variable during the process. This research offers both theoretical and practical implications for the broader implementation of adaptive leadership theory in schools. Additionally, recommendations for future research areas are provided.

Keywords: *Adaptive leadership, collaborative school culture, teacher performance*

Introduction

Teacher performance plays a crucial role in enhancing education, particularly in the context of fostering student achievement (Sirait, 2016). Various research has been carried out on this matter, and each emphasized the importance of supporting teaching performance (Afandi, Wahyuningsih, & Mayasari, 2021). According to Kusumawardhani (2017), despite the implementation of various policies, teachers have been found to continually encounter significant challenges that impede teaching performance. In order to reduce the effects of these challenges, schools must adopt and implement novel measures with the primary aim of enhancing performance. These measures must have the capability to avail teachers with continued relevance, the capability to effortlessly adapt to societal changes, and the proficiency to deal with frequent challenges.

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Several previous studies have extensively examined and assessed adaptive leadership, with a focus on mobilizing individuals to deal with performance-related challenges (Heifetz, Heifetz, Grashow, & Linsky, 2009). According to Sarid (2021), adaptive leadership constitutes crucial principles that are applicable not only in business domains but also within educational contexts. This leadership approach is considered very important, specifically considering the fact that it necessitates leaders to evaluate the inherent capability to remain objective at defining moments. It also mandates the assessment of how leaders adopt and use both existing and novel thought patterns (Khumayah, 2020). Furthermore, as stated in another research, adaptive leadership mandates leaders to pay attention to increasingly ambiguous dynamic organizational structures, alongside a workforce characterized by growing diversity in demographics, cultural backgrounds, abilities, work styles, and preferences (Castillo, 2018). Adaptive leadership is a process that aims to bring about positive change without posing a threat to those responsible for initiating and implementing the change, focuses on the process rather than individuals, and leverages the knowledge as well as input of all stakeholders involved in advancing the organization.

Several studies explored that the concept of adaptive leadership presents the advantage of effectively leading an adaptive organization (Dunn, 2020), as well as provides a framework for fostering employee commitment and active participation in identifying and implementing solutions to challenges (Randall & Coakley, 2007). Accordingly, Mukaram et al. (2021) observed that adaptive leadership also avails numerous benefits for higher educational institutions that are ready for change (Mukaram, Rathore, Khan, Danish, & Zubair, 2021). One of these benefits include the fact that it offers guidance and protection to followers who are tasked with managing the change process within an organization (Wong & Chan, 2018).

Following the earlier reviewed research, Çoban and Atasoy (2020) emphasized that school principals should prioritize not only the enhancement of leadership skills but also the cultivation of a supportive and collaborative environment for teachers. This environment can be effectively cultivated by supporting teachers to develop innovative teaching methods, embrace change, use effective problem-solving strategies, and promote a culture of sharing and exchanging teaching practices. According to Kilinc, Bellibas, and Polatcan (2022), school principals are urged to augment inherent leadership capabilities and underscore the importance of fostering a collaborative school environment to enhance teacher practice within the learning context. While leadership studies have been observed to conventionally focus solely on leadership styles and often

perceive leaders as the primary policy influencers, this perspective may not fully be in line with contemporary realities. Within the framework of school development, which typically prioritizes inclusivity and tailored education to meet the needs of all students, cultivating a collaborative school culture holds significance. The significance in this regard is primarily because collaborative ethos is particularly crucial in advancing teacher practice, a position that necessitates strong leadership skills for improvement initiatives (Mahlangu, 2023;(Palmer et al., 2023; Pretorius & Plaatjies, 2023; Waldron & McLeskey, 2010).

This present research extensively emphasizes the significance of possessing adaptive leadership behaviors among school principals. The investigation also focused on the adoption of collaborative school culture, as an essential element in elevating teacher performance. It is important to state that the existing body of research on this concept is limited, particularly regarding the implementation of adaptive leadership among school principals in the primary school context. As a result, the following questions were formulated and addressed during the course of this research:

- To what extent does adaptive leadership influence teacher performance?
- To what extent does the mediating effect of a collaborative school culture influence the relationship between adaptive leadership and teacher performance?

Literature Review

Adaptive leadership in the educational context

Over the past three decades, scholars have extensively explored the concept of adaptive leadership. For instance, Heifetz et al. (2009), defined adaptive leadership as the strategic mobilization of individuals to effectively address and overcome difficult challenges. Based on this definition, it can be inferred that an adaptive leader must possess the capacity to perceive and evaluate situations from a nuanced, informative, and comprehensive perspective, while also remaining attuned to current dynamics within the field. Furthermore, these leaders must maintain self-awareness amid conflicts and ongoing tensions (Khumayah, 2020). The principle of adaptive leadership posits that leaders do not hold all the solutions to organizational problems, hence collaboration between the leaders and stakeholders is very crucial in order to diagnose issues and devise solutions through mechanisms such as voting within the organization. This approach is considered important because it ensures equitable participation in the survival of the organization (Nelson & Squires, 2017).

The adaptive leadership theory emphasizes the role of a leader in facilitating the assignment carried out by followers within a specific context. It is important to state that this theory does not aim to solve the problems of the followers but to provide assistance towards adaptation to the prevailing circumstances (Northouse, 2021). In a comprehensive research, Heifetz et al. (2009) offered a methodical elucidation of adaptive leadership. The investigation significantly emphasized the substantial importance of scrutinizing the current systems of an organization to identify any impediments to change, which comprises structural, cultural, or intrinsic challenges. Based on the examinations made, adaptive leadership can be said to depart from conventional concepts of directing and motivating subordinates. Regardless of the fact that these conventional concepts acknowledge the value of interpersonal relationships, adaptive leadership theory predominantly accentuates the role of leaders in facilitating the flow of information.

While this leadership theory is commonly regarded as pragmatic, Yukl & Mahsud (2010) stated emphatically that contingency leadership serves as a foundational theory underlying adaptive leadership. Following this perspective, Castillo (2018) elucidated that adaptive work theory draws upon complexity and situational theories, as well as leadership styles such as adaptive and participative leadership. Typically, complexity theory equips leaders with innovative approaches to address work-related challenges and issues, supplementing traditional leader-follower methods. The theory also fosters adaptive work by including followers in decision-making processes, hence leveraging the strengths and recognizing the individual abilities of the followers with the primary aim of enhancing performance. These competencies have been observed to effectively facilitate success, task completion, and inventive problem-solving. According to Uhl-Bien & Marion (2009), adaptive leadership is associated with the mechanisms of complex adaptive systems (CAS) and was introduced to stimulate emergence, novel ideas, innovation, flexibility, and organizational transformation. Serving as an agent, the leadership concept acknowledges human decision-making abilities and recognizes human behavior as both creators and outcomes (Kwatubana & Mtimkulu, 2024; Uhl-Bien & Marion, 2009).

Teacher performance

Several studies have thoroughly examined the various perspectives and measurements regarding teacher performance in educational settings. For example, Hwang, Bartlett, Greben, and Hand (2017) explained that teacher performance comprises the actions of educators within schools that are carried out with the aim of enhancing student academic achievements by elevating the quality

of teaching. Following this, Elliott (2015) argued that the process of assessing teacher performance should be integrated with reflection and goal-setting regarding the professional efforts of educators, particularly the adopted teaching methodologies, to foster student achievement and provide feedback on the instilled professional conduct. Afandi et al. (2021) described teacher performance as the actions or responses yielding outcomes attained by educators, which are assessed based on the standard competency criteria the educators are expected to possess. In accordance with this, Mutohar and Trisnantari (2020) described this factor as the culmination of the individual and collective efforts of the educators within the organizational framework of the school. It typically comprises fulfilling assigned duties and obligations as teachers to achieve the set goals, objectives, vision, and mission of the organization.

Teacher performance is made up of diverse activities, spanning from meticulous planning of the teaching and learning process to crafting lesson plans, delivering effective instruction, conducting student assessment and evaluation, as well as fostering successful communication within the educational setting (Asim, Turi, Shahab, & Rubab, 2023). This measurement is generally governed by specific criteria, which form the basis for its evaluation. Furthermore, these criteria and competencies outline the essential attributes expected of each educator. The criteria serve as benchmarks for assessing the conduct of the teachers throughout the learning process, including performance standards related to fulfilling assigned duties. These duties typically include collaborating with students individually, meticulously preparing and planning lessons, effectively using educational resources, fostering diverse learning experiences for students, and exhibiting proactive leadership within the educational environment (Butar, Bross, & Kanto, 2020; Nhlumayo, 2024).

Adaptive Leadership and Teacher Performance

Several studies have thoroughly examined the positive role of adaptive leadership in enhancing teacher performance. As stated in a previous investigation, adaptive leadership connotes the adeptness of leaders with regard to task completion and shared responsibility. Based on this understanding, the concept can be said to guide the direction toward challenging objectives, foster robust organizational endeavors, and sustain perseverance, all of which contribute to improved performance (Squires, 2015). Following this, the concept of adaptive leadership also requires a holistic comprehension of leadership dynamics, which comprises the relationship between leaders and followers, along with the influence of environmental variables. The form of leadership consists

of not only instigating change but also discerning potential shifts in the external milieu and the potential to strategize the most advantageous course of action to advance organizational objectives (Khan, 2017).

The capacity of adaptive leaders to motivate employees toward confronting evolving challenges constitutes a proactive measure that is conducive to enhancing teacher performance. Typically, adaptive leadership centers on the actions and behaviors of leaders in facilitating the growth of employees and the attainment of elevated performance levels, thereby effectively addressing the demands of a constantly evolving working environment (Northouse, 2021; Randall & Coakley, 2007). It also includes the mobilization of individuals to confront ambiguous, substantial challenges that lack readily available solutions. This form of confrontation is usually carried out by leveraging the existing belief systems and behaviors of the mobilized individuals. Following this, as stated in previous research, adaptive leadership also acknowledges the dynamics of broader systems that significantly influence the leadership process (Haber-Curran & Tillapaugh, 2013). These studies assumed that supporting members of organization in adaptive leadership framework through the prioritization of active participation leads to improved teacher performance both as employees and members of the school. Based on this understanding, hypothesis 1 was formulated as follows,

H1. adaptive leadership is positively related to teacher Performance.

Collaborative school culture

Culture refers to a collective framework comprising shared meanings, beliefs, principles, perceptions, relationships, attitudes, and assumptions, as well as both explicit and implicit norms. This shared values has been observed to significantly influence and shape every aspect of the manner in which a school functions as an organization (Chong & Tsubota, 2023; García-Carreño, 2021; Gurusamy, Abdullah, & Abd Rahman, 2022; Tonich, 2021; Van Houtte, 2005). Culture is also regarded as a trait that fosters engagement, happiness, and satisfaction (Villena-Manzanares, García-Segura, & Pellicer, 2020).

The terms "school culture" or "organizational culture" were commonly used within the context of this literature. Organizational culture can simply be defined as the collective assumptions and beliefs held by employees regarding the organization and its environment. In accordance with this, Nugroho (2018) delineated organizational culture as the foundational framework of assumptions

and shared beliefs embedded among organizational members. These implicit elements have been observed to mold the self-perception and outlook of an organization on the external milieu. It is also important to establish that the elements also shape the responses of an organization towards challenges, both internal and external, thereby ensuring the organization's endurance and internal unity. Typically, organizational culture comprises the collective beliefs, attitudes, and experiences within an organization, which are manifested in the everyday behaviors of its members. This is evidenced by shared learning encounters, which have been observed to shape the core assumptions upheld by the constituents of an organization (Nansubuga et al., 2019; Parlar, Turkoglu, & Cansoy, 2021).

Similar to organizational culture, school culture comprises the collective ideals, unspoken traditions, underlying beliefs, and assumptions embraced by teachers, students, and administrators. These components have been observed to significantly influence the day-to-day operations of a school. Accordingly, Psunder (2009) defined school culture as a compendium of guidelines that directs the interpretation of events within the school environment and identifies appropriate responses. These guidelines also define the importance of learning and teaching, along with the core values, goals, and ideals serving as guiding principles for educators in the day-to-day activities of the institution. School culture encapsulates the collective perspectives, thoughts, and emotions of school members toward an institution. According to previous investigations, this culture can be shaped by both the attitudes possessed by teachers toward the respective professions acquired and students, as well as that of students towards the educational institution (Thien & Lee, 2023).

Within the context of the present research, school culture pertains to the collective assumptions and beliefs shared among teachers and educational stakeholders. This culture emphasizes the importance of teamwork, communication, respect, and empowerment. It also includes the act of leveraging individual expertise to foster organizational learning, while also supporting team members to embrace change, offer diverse perspectives, and openly discuss issues. As observed from previous investigations, this approach fosters constructive collaboration and consensus-building guided by shared goals, thereby facilitating effective teamwork through knowledge-sharing and mutual learning (Barczak, Lassk, & Mulki, 2010; Dickerson, 2011; Flores, 2004; Lummis, 2001).

During the course of the present investigation, it was observed that teachers play a crucial role in forging pathways or linkages through collaboration with partners or stakeholders. As a result, an inference was made that the collaborative school culture is influenced by the perceptions of teachers towards the leadership skills of school leaders, as well as the leaders' active engagement in productive dialogue that enriches the educational vision of the school. It was also observed that factors such as a shared sense of purpose guiding collective efforts towards a common mission, professional development fostering both personal growth and dedication to the advancement of the school, effective collaboration among teachers to provide mutual support, as well as partnerships among teachers, parents, and students significantly influences the school culture (Gumuseli & Eryilmaz, 2011; Gurusamy et al., 2022; Nguyen, Pietsch, & Gümüş, 2021; Turkoglu, Cansoy, & Parlal, 2021). Following this information, hypothesis 2 was formulated as follows,

H2. The relationship between adaptive leadership and teacher performance is mediated by collaborative school culture.

Method

Research Design

The present research was conducted using a cross-sectional survey design framework across 66 public elementary schools in Indonesia. The following subsections provide an overview of the data collection methods, tools, and analytical procedures adopted during the course of the investigation of adaptive leadership, collaborative school culture and teacher performance.

Sample

This research was carried out using a stratified random sampling approach. At first, all the schools considered were classified based on sub-district criteria. Moving forward, a sample was subsequently selected from each school within the district to participate in the survey. The research sample is teachers from the observed public primary schools in West Java province, Indonesia. From the data presented in Table 1, it can be seen that out of the 425 respondents, 54.1% (300 respondents) were female. It also shows that in terms of education, the majority of respondents (86.4%) were observed to possess bachelor's degrees, while 11.2% were pursuing university

education, and 2.4% had master's degree certificates. Furthermore, most of the respondents were newly appointed teachers, with experience ranging from 1 to 5 years, but senior teachers were also included and represented across all experience groups.

Table 1

Demographic Data of Respondents

Demographic variables	Categories	N	%
Gender	Male	125	45.9
	Female	300	54.1
Level of Education	Bachelor's candidate	47	11.2
	Bachelor's degree	367	86.4
	Master's degree	11	2.4
Work Experiences	1-5 years	104	24.2
	6-10 years	95	22.4
	11-15 years	99	23.3
	16-20 years	76	17.9
	> 20 years	51	12.2

Variables and Instruments

The instruments for assessing adaptive leadership skills and teacher performance were developed based on the theoretical foundations underpinning the research variables (Creswell & Creswell, 2017). The investigation initiated with the development of three instruments designed specifically to measure the three primary constructs. These scales were adapted from existing scales through a series of translation and content validation procedures. Accordingly, the back-translation technique (Brislin, 1970) was used to translate the instruments from the original form into Indonesian, thereby ensuring the accuracy of the data obtained. The translation process was carried out by a linguist who initially translated the English text into Indonesian. Following the initial translation process, content analysis was carried out by three academics who specialized in educational leadership. An expert translator then translated these results back into English. Five question items were eliminated due to concerns about potential confusion. Therefore, a total of 60 items were selected and divided into three primary scales. Each scale used a five-point Likert-type scale, with ratings ranging from 1 for strong disagreement to 5 for strong agreement. A higher score on the scale indicates a greater presence of the construct being measured.

A potential issue that is usually associated with survey data obtained from self-reports is the presence of common method bias, which poses a methodological limitation. To address this concern, the three preemptive measures were implemented following the recommendation by

Podsakoff, MacKenzie, Lee, and Podsakoff (2003). As previously emphasized, the privacy of the respondents was ensured, and assurance was provided that the obtained responses would be exclusively used for research purposes. Additionally, to discern response patterns across different sections of the questionnaire, the Likert Scale degrees were varied. It is important to also state that the principles of temporal psychology were introduced to mitigate the carryover effect. This was achieved through a rubric-based methodology, in which an introductory section clarified the stipulations and guidelines for each segment of the questionnaire. Based on observations, it was hypothesized that the response pattern of the respondents to subsequent sections of the questionnaire was influenced by neither the introductory knowledge nor the responses of the participants to items in one section.

The paper-based questionnaire was used to assess the following variables:

- Adaptive leadership behavior

To assess the nature and extent of principal adaptive leadership, 25 items were formulated based on the observations made from previous investigations (Heifetz et al., 2009; Northouse, 2021). The resulting scale in this regard comprised dimensions such as the "get on the balcony" (GOB), "identify the adaptive challenge" (IAC), "regulate distress" (RD), "maintain disciplined attention" (MDA), "give the work back to the people" (GWB), and "protect leadership voices from below" (PLV).

- Collaborative school culture

Under this variable, scales were utilized and derived from the works of scholars (Nugroho, 2018; Pérez López, Manuel Montes Peón, & José Vázquez Ordás, 2004). The scale utilized in the present research consisted of 17 items.

- Teacher Performance

To construct a measure for this concept, elements were integrated from leadership instruments developed by various scholars worldwide (Afandi et al., 2021; Saleem, Aslam, Yin, & Rao, 2020; Suprayogi, Valcke, & Godwin, 2017; Tjabolo, 2020) and the resulting scale consisted of 8 factors.

- Control variables

Consistent with prior empirical research on leadership, controls for gender (male, female) and job experience (less than and more than five years) were integrated into the hypothesis testing for the present research.

Data Collection

The data collection phase was carried out over the space of two weeks, with five surveyors tasked with distributing and collecting the paper-based questionnaires. The surveyors obtained permission directly from schools to conduct the survey and initially teachers from 66 public primary schools were invited, taking into account specific characteristics. Accordingly, respondents were assured that the provided responses would remain anonymous. Despite this number of teachers, it is important to state that 10% were either absent or declined to participate, hence, only 90% of the invited teachers responded accordingly. Upon receiving all questionnaires, those with more than 15% missing data or redundant responses were excluded. As a result, the final sample for the research comprised 425 teachers from 65 public primary schools.

Analytical strategy

The data was analyzed using SmartPLS 3.0, through the utilization of Partial Least Squares Structural Equation Modeling (SEM-PLS). From the information presented in Table 3, it can be seen that the obtained data did not meet the normality criteria and exhibited greater statistical power compared to CB SEM (Hair Jr, Matthews, Matthews, & Sarstedt, 2017). The analysis included the assessment of both the measurement and the structural models. Initially, the measurement model was used to evaluate the convergent validity of the research variables which include adaptive leadership, collaborative school culture, and teacher performance, by examining factor loadings and the average variance extracted. Additionally, the investigation assessed the Heterotrait-Monotrait ratio of correlations to evaluate discriminant validity. In order to analyze reliability, Cronbach's α was evaluated for the latent variables (Hair, Risher, Sarstedt, & Ringle, 2019). During the second step, the evaluation of the structural model comprised both direct and indirect influences, which are commonly referred to as mediating effects. Bootstrapping was also adopted with the aim of assessing the significance of hypothesis testing across 5000 resampling iterations. The assessment included the coefficient of determination (R^2), the blindfolding-based cross-validated redundancy measure Q^2 , and the path coefficients (Hair Jr et al., 2017).

Findings

The key constructs included in the present research include adaptive leadership behavior, collaborative school culture, and teacher performance.

Descriptive Analysis and Correlation among the Research Constructs

The present research comprised three primary constructs namely Adaptive Leadership, Collaborative School Culture, and Teacher Performance. Table 2 shows the means, standard deviations, and correlations among these key variables. From the data documented in the table, it can be seen that adaptive leadership positively correlated with both collaborative school culture ($r = 0.636$, $p < 0.01$) and teacher performance ($r = 0.438$, $p < 0.01$), while Collaborative School Culture also correlates with teacher performance. Following this, only one significant association was found between the demographic characteristics of the respondents, specifically experience, which positively correlates with collaborative school culture ($r = 0.101$, $p < 0.05$).

Table 2

Means, standard deviations, and correlations among the research variables

Variable	mean	SD	1	2	3	4	5
Gender	.5412	.49889	1				
Experience	.5341	.49942	-.036	1			
Adaptive Leadership	3.9922	.46611	-.026	.043	1		
Collaborative School Culture	3.9808	.39836	-.034	.101*	.636**	1	
Teacher Performance	3.9425	.35054	.038	.045	.438**	.594**	1

Notes: n= 425. * $p < 0.05$; ** $p < 0.01$

Measurement Model Assessment

The obtained data was analyzed using a combination of Structural Equation Modeling (SEM) and Smart-PLS. Accordingly, the measurement approach adopted consisted of three primary latent components namely adaptive leadership, collaborative culture, and teacher performance. The assessment of the reflective measurement model included various factors such as reflective indicator loadings, internal consistency reliability, convergent validity, and discriminant validity (Hair et al., 2019). This measurement comprised assessing the relationship between the underlying concepts and the observable variables serving as indicators.

Table 3 shows that certain indicators were removed from the final model because one indicator each from the adaptive leadership and collaborative school culture variables, and two indicators from the teacher performance variable, did not meet the cutoff of 0.4, and the obtained Average Variance Extracted (AVE) values of the indicators were insufficient. Additionally, Model 1 was observed to exhibit poor loading factors and AVEs, leading to the removal of three factors. In the

second model, the AVEs exceeded 0.5, indicating that the model surpassed the convergent reliability criterion (Henseler, Ringle, & Sarstedt, 2012).

Table 3

The result of the measurement model

Variable	Indicators	SFL			
		Model 1	Model 2	skewness	kurtosis
Adaptive	Get on the balcony (GOB)	0.703	0.703	-0.427	0.504
Leadership	Identify the adaptive challenge (IAC)	0.511	-	-0.385	-0.516
Behavior	Regulate distress (RD)	0.754	0.751	-0.548	0.332
$\alpha=0.774$	Maintain disciplined attention (MDA)	0.619	0.639	-0.439	-0.026
CR=0.847	Give the work back to the people (GWB)	0.664	0.745	-0.629	0.669
AVE=0.526	Protect leadership voices from below (PLV)	0.714	0.744	-0.893	0.833
Collaborative school culture	Long-term view and anticipate changes (LTV)	0.634	0.666	-0.281	-0.333
$\alpha=0.836$	Encouragement of communication and dialogue (ECD)	0.741	0.735	-0.367	0.109
CR=0.877	Teamwork (TW)	0.750	0.775	-0.647	0.188
AVE=0.506	Empowerment (EM)	0.453	-	-0.613	1.856
	Trust and Respect individual (TRI)	0.661	0.714	-0.161	0.353
	Ambiguity tolerance (AT)	0.679	0.687	-0.525	0.701
	Risk assumption and respect (RA)	0.651	0.684	-0.43	1.191
	Encouragement for diversity (ED)	0.707	0.711	-0.318	2.957
Teacher	planning (IP)	0.625	0.630	0.021	-0.126
Performance	Introduction activity (IA)	0.576	0.603	-0.483	-0.813
$\alpha=0.818$	material (IM)	0.775	0.780	-0.552	0.058
CR=0.869	Instructional Strategy (IS)	0.678	0.689	-0.49	-0.088
AVE=0.529	Learning Media (LM)	0.037	-	0.127	-0.32
	Student Involvement (SI)	0.114	-	-0.222	1.637
	Student Evaluation (IE)	0.803	0.810	-0.783	3.776
	Closing activities and feedback (CA)	0.808	0.822	-1.032	3.13
Notes: n= 364. SFL= standardized factor loading, CR, composite reliability, AVE, average variance extracted, α , Cronbach α					

Table 3 also indicated "satisfactory to good" internal composite reliability, as Cronbach's α values fall between 0.60 and 0.70 (Hair et al., 2019). The results showed that the measurement model exhibited strong internal consistency. To assess discriminant validity based on the heterotrait-monotrait (HTMT0.85) criterion, this research referred to the investigation conducted by Henseler et al. (2015). As shown in Table 4, all the obtained values were below the threshold of 0.85, providing further evidence supporting the distinctiveness of the adopted measurement model.

Table 4
Discriminant Validity (HTMT criterion)

	ALB	CSC	TP
ALB			
CSC	0.721		
TP	0.567	0.69	

Structural Model Assessment

The result obtained from the measurement model suggested that the model was suitable for assessing the structural model. Several steps, including standard assessment criteria, were considered in this regard. These criteria comprised the coefficient of determination (R²), the blindfolding-based cross-validated redundancy measure Q², and the statistical significance and relevance of the path coefficients (Hair et al., 2019).

Table 5
Coefficient of Determination and Predictive Relevance

Variable	Coefficient Determinant (R ²)	Predictive relevance (Q ²)
Collaborative School Culture	0.340	0.167
Teacher Performance	0.356	0.179

Table 5 shows that the coefficient of determination (R²) for collaborative school culture and teacher performance, as endogenous variables, were at a moderate level. Following this, the Q² measure was used to assess how well the observed values were reproduced by the model and its estimated parameters. The data presented in Table 5 further shows that the predictive relevance (Q²) of the endogenous variables is greater than 0, indicating meaningful predictive relevance.

Table 6.
Result of the Direct Effect

Relationship	Path coefficient	T value	P value	Result
ALB -> CSC	0.583***	16.159	0.000	Supported
ALB -> TP	0.179**	2.908	0.004	Supported
CSC -> TP	0.470***	7.919	0.000	Supported
EXPERIENCES -> TP	0.037	0.035	0.389	Not Supported
GENDER -> TP	0.039	0.039	0.310	Not Supported

Note: n= 425 ALB= Adaptive leadership behavior, CSC =Collaborative school culture, TP =Teacher Performance. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6 presents the statistical significance and relevance of the path coefficients, as hypotheses testing. In line with the expectations, it was found that adaptive leadership had a direct and significant impact on teacher performance ($\beta = 0.179$, $p = 0.000$), hence leading to the acceptance of Hypothesis 1. The finding supports the hypothesis that adaptive leadership positively influences teacher performance. This suggests that higher adaptive leadership behavior in principals corresponds to higher teacher performance.

Principal adaptive leadership was observed to significantly and positively impact the variation of collaborative school culture ($\beta = 0.583$, $p = 0.004$), which, in turn, substantially impacts teacher performance ($\beta = 0.470$, $p = 0.000$). However, factors such as gender and work experience, included as control variables, were found to have no significant effect on teacher performance. This was evidenced by the values obtained for the two variables, which were ($\beta = 0.037$, $p = 0.389$) and ($\beta = 0.039$, $p = 0.310$), respectively.

Table 7

Path Coefficient for the indirect effect

Hypothesis	coefficient	t-value	p-value	97.5%CI	Result
ALB -> CSC -> TP	0.274	8.153	0.000	[0.204,0.339]	Supported

In order to examine mediation effects, the criteria outlined by Hayes and Scharkow (2013) were applied using SmartPLS 3.0. The results showed that the impact of adaptive leadership on teacher performance, mediated by collaborative school culture, was statistically significant ($\beta = 0.47$, $p = 0.000$). Furthermore, a bias-corrected bootstrapping analysis was carried out at a 95% confidence interval to quantify the indirect effect of adaptive leadership on teacher performance through the mediating variable. This analysis further emphasized the crucial role of a collaborative school culture in enhancing teacher performance.

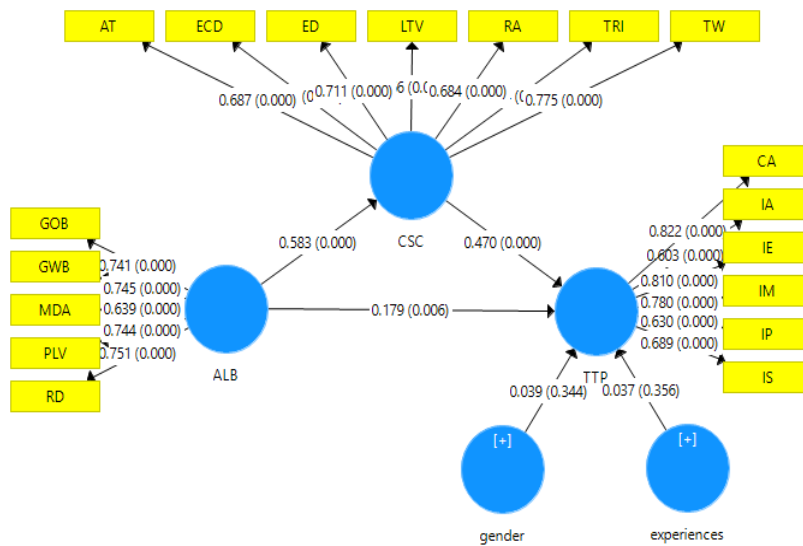


Figure 1. Overall model.

note. ALB= adaptive Leadership Behaviour, CSC = Collaborative School Culture, TTP=Teacher Performance.

Discussion

During the course of this research, a model was constructed based on complexity leadership theory to elucidate the manner in which adaptive leadership can enhance teacher performance in Indonesia. Firstly, the investigation emphasizes the significance of adaptive leadership as a key variable in enhancing teacher performance. This emphasis is in line with previous propositions that have contributed to the understanding of adaptive leadership in organizational contexts (Heifetz et al., 2009). The investigation also significantly examined the impact of adaptive leadership behavior on teacher performance, and the obtained results are consistent with prior research that has advocated for fostering leadership styles to increase staff performance (Saleem et al., 2020; Wase, 2023). The finding in this regard is also contrary to the exploration of Parveen, Quang Bao Tran, Kumar, and Shah (2022) where it was suggested that principal behavior characterized by high authority and limited teacher engagement should be maintained.

These results are also congruent with previous research, which has amassed substantial evidence advocating for the adoption of various adaptive leadership behaviors (Byrnes, 2019; Randall & Coakley, 2007). However, recognizing adaptive challenges as a component of adaptive leadership is undeniably more challenging to implement. For example, when the principal of a public school attempts to decipher these challenges and delegates some authority to teachers to provide feedback on adaptive solutions, it can create confusion among the educators. Randall and Coakley (2007)

proposed that an adaptive leader has the capability to categorize technical challenges into two distinct types. The first type comprises everyday issues that can be addressed using conventional solutions. Meanwhile, the adaptive challenge is characterized by its unique and uncommon nature, which typically requires the integration of input from all stakeholders affected by the situation. According to (Sunderman, Headrick, & McCain, 2020), leaders confronted with adaptive challenges tend to exhibit flexibility by considering various perspectives and taking decisive action. Still considering the subject matter, (Heifetz et al., 2009) proposed four archetypes for diagnosing adaptive challenges within organizations, namely exposed values and behavior, competing commitments, speaking the unspeakable, and work avoidance.

Secondly, this research corroborates the concept of collaborative school culture, as emphasized by Waldron and McLeskey (2010). This concept was observed to serve as an effective mediator in assessing the influence of adaptive leadership on the performance of teachers. The results obtained in this research emphasized that a collaborative school culture serves as a mediator in the link between adaptive leadership and teacher performance. This observation is in line with previous investigations that have offered evidence supporting the mediating role of collaborative school culture in the relationship between principal leadership and teacher factors (S. Liu, Keeley, Sui, & Sang, 2021; Y. Liu, Bellibaş, & Gümüş, 2021; Özdemir, 2019). The relationship between adaptive leadership and teacher performance was found to be more significant when considering the collaborative school culture. This observation provides administrators with a clearer directive to not only adopt adaptive leadership to improve teacher performance but also to foster a collaborative school culture to maximize outcomes. Accordingly, various previous research has posited that promoting adaptive leadership in schools prompts a shift in the behavior of teachers, with a primary focus on fostering effective teamwork among colleagues and establishing meaningful connections with other stakeholders in the education system. This culture consequently plays a significant role in enhancing teachers' performance when carrying out assigned roles.

According to Khanal (2021), principals in non-western public schools are required to offer support to help achieve school outcomes collaboratively with teachers (Khanal, 2021). In line with this, Parker and Raihani (2011) reported instances of exceptional schools in Indonesia, where principals delegate authority and accountability to other educators, collaborate with parents and community leaders, exhibit commendable conduct, and establish a distinct vision integral to the institution. Another investigation, which was carried out by Sumintono, Sheyoputri, Jiang, Misbach, and

Jumintono (2015) emphasized that school systems in Indonesia hold significant potential for improvement. However, this potential can only be realized with responsible leadership empowered to innovate and drive change.

Practical Implication

The present research is poised to offer three significant implications for leadership practice in the current era. Firstly, principals must prioritize the crucial role of teacher performance within the institution. In order to achieve this, implementing the six adaptive leadership practices as guidelines could prove instrumental (Byrnes, 2019). The principal is also strongly advised to create a supportive and safe environment for teachers to address challenging issues that may arise as well as maintain a confident and calm demeanor during conflict situations. Secondly, the importance of fostering a collaborative school culture should serve as a reminder to principals to prioritize the cultivation of a positive school environment. Typically, the process of creating a positive school environment includes fostering strong and meaningful collaboration among teachers, parents, and the community. It is important to establish that while principals uphold the autonomy of the professional roles of teachers, the contemporary emphasis on collaboration is anticipated to positively impact the work performance of the educational, specifically concerning student learning outcomes. Finally, considering the crucial roles played by adaptive leadership within organizational contexts, it becomes important that policymakers in Indonesia consider fostering the implementation of this leadership concept for school administrators. The present research also emphasized the importance of maintaining records related to the adaptive leadership methods employed by school principals in public schools.

Conclusions

In conclusion, this research has contributed significantly to the existing literature on the linking of adaptive leadership on teacher performance. Furthermore, by presenting empirical data within a developing cultural context, this exploration emphasized the manner in which adaptive leadership can influence teacher performance. It also provides substantial information about the potential of enhancing collaborative school culture as a mediator between adaptive leadership and teacher performance. Lastly, this research reinforces previous assertions regarding the importance of the

adaptive leadership behaviors of principals in fostering a collaborative school culture and improving teacher performance.

Limitation and Future Research

The present research has certain associated limitations, all of which should be considered when conducting future research. Firstly, despite efforts to collect a reasonably representative sample of the population, it is crucial to recognize that the obtained sample may still not fully reflect the diversity of teachers in Indonesia. Therefore, it is recommended that future investigations include teachers from both urban and rural schools in order to ensure a more comprehensive representation. Secondly, the data collection process relied solely on the self-assessment and perceptions of teachers regarding school and principal leadership. This raises concerns about the objectivity of the data, as teacher reports may be influenced by personal biases or the need to conform to social norms. To address this limitation, future research should consider using multi-source data to provide a more comprehensive and objective understanding of the relationships examined.

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