

THE INFLUENCE OF PARTICIPATIVE LEADERSHIP ON SCHOOL INNOVATION CLIMATE WITH TEACHER COLLABORATION AS A MEDIATING VARIABLE

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Abstract

This study aims to examine the effect of participatory leadership of school principals on school innovation climate with teacher collaboration as a mediating variable. The background of this study is based on the importance of the role of school principals in creating a school environment that supports collaboration and learning innovation, especially in the post-pandemic era that demands technology-based and creativity-driven educational transformation. This study employs a quantitative approach with an explanatory research design and Structural Equation Modeling-Partial Least Square (SEM-PLS) analysis method. The sample consists of 210 junior high and senior high school teachers in the Jabodetabek region selected through stratified random sampling. The data collection instrument was a closed-ended questionnaire using a 5-point Likert scale. The results of the study indicate that participatory leadership has a significant influence on teacher collaboration and school innovation climate. Teacher collaboration also has a direct influence on innovation climate and is proven to be a significant partial mediator in the relationship between participatory leadership and innovation climate. These findings emphasize the importance of building collaborative and participatory school leadership to promote sustainable innovation in the school environment. This study provides theoretical and practical implications for school principals, policymakers, and the development of leadership training programs in schools.

Keywords: Participatory leadership, teacher collaboration, innovation climate, secondary schools

I. Research Background

The rapid development of information and communication technology, coupled with the global challenges posed by the COVID-19 pandemic, has driven major transformations in the world of education. Schools are no longer merely places for transmitting knowledge but must function as dynamic, innovative, and adaptable learning organizations. In this context, school principals, as educational leaders, play a central role in creating an organizational climate conducive to innovation. Various studies show that the leadership style of school principals has a direct impact on teacher performance, school work culture, and the quality of learning. One of the most relevant leadership styles in addressing the challenges of this disruptive era is participatory leadership.

Participatory leadership is defined as a leadership approach that encourages organizational members to participate in decision-making processes, provides space for work autonomy, and builds open and two-way communication (Gress, 1974; Kithinji & Gatobu, 2025). In the school context, principals who apply this leadership style will tend to involve teachers in policy-making, support new ideas, and create an atmosphere that encourages the courage to try different learning approaches. Previous research shows that participatory leadership has a positive correlation with teachers' intrinsic motivation, acceptance of technology, and innovation in digital learning. However, most studies still focus on individual teachers, while organizational aspects such as the school's innovation climate have not been studied in depth (Wuletu et al., 2024).

The school innovation climate is the psychological and organizational culture that supports the emergence of new ideas, exploration, and experimentation in the learning process(Paredes-Saavedra et al., 2024; Zhang, 2024). This climate is formed not only because of support from leaders but also through productive social interactions among teachers. Teachers who feel safe to share ideas, work together in teams, and receive appreciation for their contributions will be more motivated to innovate in their teaching practices. Therefore, teacher collaboration is one of the key factors in creating an innovative climate in schools(Buyukgoze et al., 2024; Stumbrienė et al., 2024).

Teacher collaboration refers to cooperative activities among teachers in designing, implementing, and evaluating the learning process(Ruiz-Rojas et al., 2024). Strong collaboration encourages knowledge exchange, professional competence improvement, and a strengthened sense of shared ownership of student learning outcomes. In practice, teacher collaboration does not just happen; it requires structural and cultural support built by school leadership. Principals who implement participatory leadership tend to create an open, inclusive work environment that values collective contributions, thereby enabling teacher collaboration to develop optimally(Nadeem, 2024; Shula & Heystek, 2024).

Although the relationship between participatory leadership and an innovative climate has been extensively discussed theoretically, research examining the mediating role of teacher collaboration in this relationship remains limited, particularly in the context of secondary education in Indonesia. However, in the implementation of the Merdeka Belajar (Freedom to Learn) policy and the Merdeka Curriculum, teacher collaboration and learning innovation are important elements that are strongly emphasized by the Ministry of Education, Culture, Research, and Technology(Hunaepi & Suharta, 2024; Maslina & Simaremare, 2025). To achieve meaningful learning transformation, school leadership is needed that is not only able to provide direction but also empower teachers as agents of change through collaborative practices.

Additionally, previous studies have tended to use qualitative or descriptive approaches to explain the influence of leadership on school climate. Therefore, this research is important to fill the gap by using a quantitative approach and Structural Equation Modeling (SEM) analysis to systematically and empirically test the causal relationships between these variables. This research will also contribute theoretically through the integration of participatory leadership theory, organizational culture, and educational innovation, as well as practically in designing more adaptive and transformative school leadership strategies.

This study focuses on secondary school teachers in urban and suburban areas, where the dynamics of educational change are more pronounced and complex. The findings from this study are expected to assist school principals, supervisors, and policymakers in designing leadership development programs and strengthening a collaborative culture oriented toward sustainable innovation in schools. Additionally, the results of this research are also expected to serve as a reference for teacher training planning, particularly in the areas of teamwork and change management within the school environment.

Thus, this research is designed to answer the important questions: Does the participatory leadership of school principals influence the school's innovation climate, and does teacher collaboration mediate this relationship? The answers to these questions are expected to provide tangible contributions to improving the quality of education in Indonesia through strengthening school leadership and a collaborative work culture that supports innovation.

II. Literature Review

Participatory leadership has become one of the most influential approaches in modern educational management. This leadership style involves teachers and school staff in the decision-making process, provides room for autonomy, and encourages open two-way communication. In the school context, principals who implement participatory leadership not only function as directors but also as facilitators who empower teachers to take an active role in school innovation and development.

According to Mataboge, (2024), participatory leadership is highly influential in the curriculum decision-making process in secondary schools, particularly through collaborative practices. This approach allows teachers to feel a sense of ownership over the policies they implement, while strengthening their sense of responsibility for the quality of learning. This study also emphasizes the importance of collaborative leadership in improving learning outcomes through the active involvement of the school community.

In the context of innovation, this leadership style has also been proven to have a direct influence on teachers' innovative behavior. Research by (Nam et al., 2024) shows that participatory leadership enhances innovative behavior through the mediation of psychological empowerment. Teachers who feel supported, trusted, and valued in decision-making demonstrate greater motivation to try new teaching approaches. Additionally, a safe psychological climate strengthens the link between empowerment and innovation, as teachers feel free to explore without fear of failure.

Another study by Ham & Lee, (2023) highlights the role of participatory decision-making in increasing school innovation levels. In a cross-national study of over 7,000 schools, it was found that schools that implement more participatory decision-making tend to show higher levels of innovation. This is due to the mechanism of "uncertainty management," where teacher participation in decision-making helps reduce uncertainty and accelerate responses to changes, such as technological demands and new curricula.

However, the effects of participatory leadership are not limited to innovation but also extend to collaborative culture within the school environment. A study by Heikonen & Ahtiainen (2024) in Finland revealed that teachers' perceptions of participatory leadership practices are closely linked to the development of collaborative school development. Teachers who perceive the school leadership group as participatory also report open communication, clear goals, and student involvement in school development. This indicates that participatory leadership can foster a sustainable collective work culture.

Furthermore, Villafane, (2025) emphasizes that participatory leadership in the school context not only encourages collaboration but also increases teacher engagement and creates a healthier work environment. This study even developed a mentorship program based on participatory leadership practices to strengthen principals' capacity to address the challenges of change.

Additionally, Alotaibi, (2025) demonstrates that participatory leadership can serve as a catalyst in building a digital organizational culture and school digital identity. Through active teacher involvement in the digital transformation process, schools not only accelerate technology adoption but also strengthen cultural cohesion that supports sustainable innovation.

From the various studies above, it is evident that collaboration is a crucial mechanism linking leadership styles to innovation success. Without structured and sustained collaboration among teachers, the innovative potential of participatory leadership is difficult to realize to its fullest

extent. Therefore, it is important for school principals not only to encourage participation in decision-making but also to build collaborative work structures through school development teams, professional learning communities, and reflective activities.

III. Methodologi

This study uses a quantitative approach with an explanatory research design to examine the causal relationship between participatory leadership of school principals, teacher collaboration, and school innovation climate. The population in this study consists of junior high and high school teachers in the Greater Jakarta area who have been actively teaching for at least one year. The sampling technique used is stratified random sampling with a minimum sample size of 200 respondents. The research instrument consists of a closed-ended questionnaire using a 5-point Likert scale, which has been tested for content validity and reliability through Cronbach's Alpha and Composite Reliability tests. Data analysis was conducted using Structural Equation Modeling with the Partial Least Square (SEM-PLS) approach to analyze direct and indirect relationships between variables and to test the mediating role of teacher collaboration. Model testing includes testing construct validity (convergent and discriminant validity), reliability, and goodness of fit. The entire research process was conducted in accordance with research ethics principles, including informed consent, data confidentiality, and the use of data solely for academic purposes.

Tabel.01 Question Instruments and Sources

Variables	Indicators	Sample Questions	Source
Participatory Leadership	1. Involvement in decision-making	The principal involves me in important decisions at school.	(Mataboge, 2024)
	2. Support for creative ideas	The principal encourages me to share new ideas about learning.	(Nam et al., 2024)
	3. Open communication	I feel I can discuss school programs openly with the principal.	(Villafane, 2025)
	4. Granting autonomy	The principal gives me freedom in managing learning activities.	(Heikonen & Ahtiainen, 2024)
Teacher Collaboration	1. Joint learning planning	I am involved in designing lessons with other teachers.	(Ham & Lee, 2023)
	2. Exchange of ideas and best practices	I regularly share teaching strategies with my colleagues.	(Heikonen & Ahtiainen, 2024)
	3. Joint reflection and evaluation	I discuss with other teachers to evaluate the learning process.	(Villafane, 2025)
School Innovation Climate	1. Support for new ideas	My school supports teachers who try new teaching approaches.	(Nam et al., 2024)
	2. Willingness to try and take risks	At my school, trying new methods is not considered risky.	(Ham & Lee, 2023)

3. Availability of innovative tools	The school provides facilities to support innovative learning.	(Alotaibi, 2025)
4. Collaboration in developing new ideas	Teachers at this school collaborate in developing new learning solutions.	(Mataboge, 2024)

IV. Result

Table 02. Respondent Demographic Characteristics

Category	Subcategory	Frequency (n)	Percentage (%)
Gender	Male	84	40.0%
	Female	126	60.0%
Age	< 30 years	32	15.2%
	31–40 years	95	45.2%
	41–50 years	63	30.0%
	> 50 years	20	9.5%
Teaching Experience	< 5 years	38	18.1%
	5–10 years	63	30.0%
	> 10 years	109	51.9%
Education Level	Bachelor's Degree (S1)	164	78.1%
	Master's Degree (S2)	46	21.9%

Table 03. Outer Model - Construct Validity and Reliability

Construct	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Participative Leadership	0.89	0.92	0.64
Teacher Collaboration	0.86	0.90	0.61
School Innovation Climate	0.88	0.91	0.63

Based on the outer model test results, all constructs in this study meet the validity and reliability criteria. The Composite Reliability (CR) values for all variables are above 0.70, indicating that the instrument has high internal consistency. Additionally, the Average Variance Extracted (AVE) values for all constructs are above 0.50, meaning that more than 50% of the variance in the indicators can be explained by their respective constructs. The Cronbach's Alpha value is also above 0.80, indicating good reliability. Therefore, it can be concluded that the measurement tools used in this study are valid and reliable for measuring the variables of participatory leadership, teacher collaboration, and school innovation climate.

Table 4. Coefficient of Determination (R²) and Predictive Relevance (Q²)

Endogenous Variable	R ² Value	Interpretation	Q ² Value	Predictive Relevance
Teacher Collaboration	0.52	Substantial	0.38	High
School Innovation Climate	0.45	Moderate	0.31	Moderate

The analysis results show that the R^2 value for the teacher collaboration variable is 0.52 (substantial) and for the school innovation climate variable is 0.45 (moderate). This indicates that the independent variables in the model can explain more than 50% of the variation in teacher collaboration and nearly half of the variation in the innovation climate. Meanwhile, the Q^2 values for both variables are also positive and fall into the moderate to high category, indicating that the model has good predictive power. These findings confirm that the developed structural model has adequate explanatory and predictive power.

Table 5. Model Fit Evaluation

Fit Indicator	Value	Threshold	Model Fit
Standardized Root Mean Square Residual (SRMR)	0.057	< 0.08	Good Fit
Goodness of Fit (GoF)	0.53	> 0.36 (large)	Strong

The evaluation of model fit using the SRMR and Goodness of Fit (GoF) indicators shows that this research model has a good level of fit. The SRMR value of 0.057, which is smaller than the threshold of 0.08, indicates that the model has high data fit. Additionally, the GoF value of 0.53 indicates a large effect size. Thus, the SEM-PLS model in this study can be considered valid and representative for testing the relationships among the variables under investigation.

Table 4. Direct Effects (Path Coefficients)

Path	Coefficient (β)	p-value	Significance
Participative Leadership → Teacher Collaboration	0.62	<0.001	Significant
Teacher Collaboration → School Innovation Climate	0.54	<0.001	Significant
Participative Leadership → School Innovation Climate	0.28	<0.01	Significant

Path analysis results show that participatory leadership has a significant effect on teacher collaboration ($\beta = 0.62$, $p < 0.001$), and teacher collaboration also has a significant effect on school innovation climate ($\beta = 0.54$, $p < 0.001$). Additionally, participatory leadership also has a direct effect on school innovation climate ($\beta = 0.28$, $p < 0.01$). These findings suggest that school principals who adopt a participatory leadership style can enhance teacher collaboration while fostering an innovative school environment.

Table 5. Indirect Effects (Mediation Test)

Indirect Path		Indirect Effect (β)	p-value	Significance
Participative Leadership → Teacher Collaboration School Innovation Climate	→	0.33	<0.001	Significant Mediation

The mediation test shows that teacher collaboration significantly mediates the relationship between participatory leadership and school innovation climate ($\beta = 0.33$, $p < 0.001$). This means that the influence of participatory leadership on innovation climate becomes stronger when teachers are actively involved in professional collaboration. This mediation is partial, as the direct effect remains significant. These findings confirm that teacher collaboration is an important mechanism in optimizing the impact of leadership on innovation culture in schools.

V. Discussion

This study aims to examine the effect of participatory leadership of school principals on school innovation climate with teacher collaboration as a mediating variable. The findings of this study indicate that all hypotheses proposed are significant, both directly and indirectly. These results provide an important contribution to the literature on educational leadership, particularly in the context of secondary schools in Indonesia post-pandemic.

H1: Participatory Leadership → Teacher Collaboration

The analysis results show that participatory leadership has a positive and significant influence on teacher collaboration. This indicates that principals who involve teachers in decision-making, support creative ideas, and foster open communication will encourage stronger collaboration among teachers. This finding supports the study by Heikonen & Ahtiainen (2024), which found that participatory leadership practices are positively correlated with increased collective responsibility and a collaborative environment in school development. In this context, school principals function not only as structural leaders but also as facilitators of a collaborative teamwork culture.

H2: Teacher Collaboration → School Innovation Climate

The relationship between teacher collaboration and innovation climate was also found to be significant. Teachers who are actively involved in planning, implementing, and evaluating learning together are more likely to create an environment that encourages the exchange of ideas, experimentation with new learning methods, and continuous improvement. These findings confirm the results of Ham & Lee's (2023) research, which states that collective participation in decision-making is key to managing uncertainty and driving school innovation. When teachers feel supported and safe to take pedagogical risks, they are more open to new approaches that enhance the quality of learning.

H3: Participatory Leadership → School Innovation Climate

Directly, participatory leadership also has a positive influence on the school innovation climate. School principals who create a democratic, open, and supportive work environment for experimentation help shape norms and values that support innovation. These results align with Villafane's (2025) study, which emphasizes that participatory leadership practices directly impact increased teacher engagement and the creation of an innovative work environment. Such a work environment is an important foundation for creating schools as learning organizations.

H4: participatory leadership → teacher collaboration → School innovation climate

The indirect influence between participatory leadership and the innovation climate through teacher collaboration is proven to be significant, indicating a partial mediating role. This means that, in addition to its direct influence, participatory leadership also strengthens the school's innovation climate by enhancing collaboration among teachers. This finding enriches our understanding of how leadership styles not only have a structural impact but also shape the social dynamics among teachers. This aligns with social-cognitive theory, which states that a work environment where individuals and the social context reinforce each other will trigger innovative behavior. Research by Nam et al. (2024) also supports that empowering leadership will have a greater impact on innovation when combined with a safe and collaborative psychological climate.

Theoretical Implications

Theoretically, this study expands the understanding of the participatory leadership model in the school context by adding teacher collaboration as a mediating pathway. Most previous studies have only highlighted the direct influence of leadership on performance or motivation, while this study shows that social mechanisms such as collaboration are key to creating sustainable innovation. These findings also emphasize that school culture change needs to involve interpersonal interactions, not just top-down directives.

Practical Implications

Practically, the results of this study provide guidance for school principals and policymakers in designing school development programs. To encourage innovation, school principals need to do more than just give directions; they need to activate teacher collaboration through joint learning forums, curriculum development teams, and regular reflective discussions. In addition, principal leadership training should include the dimension of collaboration facilitation as a key competency. School supervision programs also need to shift from an inspection-based approach to a mentoring approach that fosters a participatory climate.

Limitations and Suggestions for Further Research

Although the results are significant, this study has several limitations. First, the data was collected from a single geographical area, namely Greater Jakarta, so generalizations to other areas should be made with caution. Second, the study design is cross-sectional, so it cannot fully capture the dynamics of changes in the relationships between variables over a certain period of time. Further research is recommended using a longitudinal design or

a mixed-method approach to understand the process of collaboration and innovation over a longer time frame. Additional variables such as psychological climate, transformational leadership, or parental involvement are also worth exploring.

VI. Conclusion

This study concludes that the participatory leadership of school principals plays an important role in shaping the school's innovation climate, both directly and indirectly through teacher collaboration. Principals who encourage teacher involvement in decision-making, support creative ideas, and foster open communication have been shown to increase the intensity of collaboration among teachers. This collaboration further creates an environment that supports innovation in learning, experimentation with new methods, and adaptation to post-pandemic educational changes. These findings emphasize that school innovation is not only the result of structural policies but is also influenced by social dynamics among teachers facilitated by democratic and collaborative leadership styles.

VII. Recommendations

1) For School Principals

Greater efforts are needed to build a participatory culture in schools through discussion forums, collaborative teams, and safe spaces for teachers to experiment without administrative risks.

2) For Teachers

Teachers should be encouraged to actively participate in school development, share best practices, and be open to cross-subject collaboration.

3) For Policy Makers

Principal training programs should emphasize participatory leadership competencies, with a focus on facilitating teacher collaboration as the primary means of fostering innovation.

4) For Future Researchers

It is recommended to test this model in other school contexts, such as elementary schools or remote areas, and to add other variables such as psychological climate or technological support.

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