

# The Influence of Principal Transformational Leadership, Organizational Culture Through *Knowledge Sharing* on the Innovative Behavior of Elementary School Teachers in South Solok Regency

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## Abstract

This study aimed to examine the relationships of principals' transformational leadership and organizational culture with elementary school teachers' innovative behavior and to determine the mediating role of knowledge sharing in these relationships. A quantitative cross-sectional survey design was employed involving 291 public elementary school teachers in South Solok Regency, Indonesia, selected from a population of 1,190 teachers through stratified proportional random sampling. Data were collected using validated five-point Likert-scale questionnaires and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. The results showed that transformational leadership was positively associated with teachers' innovative behavior ( $\beta = 0.141$ ,  $t = 2.883$ ,  $p = 0.002$ ) and knowledge sharing ( $\beta = 0.267$ ,  $t = 4.844$ ,  $p < 0.001$ ). Organizational culture was positively associated with knowledge sharing ( $\beta = 0.515$ ,  $t = 9.655$ ,  $p < 0.001$ ) but had no significant direct relationship with innovative behavior ( $\beta = -0.034$ ,  $t = 0.566$ ,  $p = 0.286$ ). Knowledge sharing demonstrated the strongest relationship with innovative behavior ( $\beta = 0.722$ ,  $t = 16.322$ ,  $p < 0.001$ ) and significantly mediated the relationships between transformational leadership and innovative behavior ( $\beta = 0.193$ ) and between organizational culture and innovative behavior ( $\beta = 0.372$ ). The model explained 61.9% of the variance in teachers' innovative behavior. These findings underscore knowledge sharing as a central organizational mechanism linking leadership and school culture with teacher innovation. Given the cross-sectional and self-reported nature of the data, future studies should employ longitudinal and mixed-method designs across broader educational contexts.

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## Introduction

Rapid changes in the educational environment due to technological developments, digital transformation, and the demands of 21st-century competencies have placed innovation as a key prerequisite for improving educational quality (Akour & Alenezi, 2022; Zou et al., 2025). In this context, teachers no longer merely serve as transmitters of knowledge but also as agents of change capable of creating, developing, and implementing various learning innovations (Siregar, 2025). Teachers' innovative behavior is a strategic factor because it contributes to improving the quality of the teaching and learning process, schools' ability to adapt to change, and student learning outcomes. Various studies have shown that teachers with innovative behavior are better able to develop creative learning, integrate digital technology, effectively resolve learning problems, and build student-centered learning environments (Vermeulen et al., 2022; Li et al., 2024). Therefore, strengthening teachers' innovative behavior is a crucial issue in modern educational management.

Theoretically, innovative behavior is understood as a series of individual activities that include exploring opportunities, generating ideas, promoting ideas, and implementing new ideas that add value to the organization. This behavior is influenced not only by individual characteristics but also by organizational factors that can create a climate conducive to innovation (Kmieciak, [2021](#); AlEssa & Durugbo, [2022](#)). From a transformational leadership perspective, the principal plays a role in building a shared vision, providing inspiration, intellectual stimulation, and individual support that encourages teachers to take risks and produce innovation (Wilson Heenan et al., [2023](#)). On the other hand, a collaborative organizational culture creates values, norms, and work habits that support creativity, while knowledge sharing serves as a mechanism for exchanging experiences, information, and knowledge among teachers, accelerating the birth of new ideas (Yakob et al., [2025](#)). These three factors are conceptually interrelated in building teacher innovative behavior and therefore need to be analyzed as an integrated model.

Although the relationship between these variables has been extensively studied, previous research still shows several limitations. Some studies found that transformational leadership directly influences teachers' innovative behavior, while others showed that this influence is stronger when mediated by organizational variables, such as teacher empowerment, work climate, or knowledge sharing (Uffelman et al., [2021](#); Borsboom et al., [2021](#)). Research on organizational culture also generally positions this variable as a direct predictor of innovation without examining the mechanism of knowledge transfer as a process that explains this relationship. Furthermore, most research has been conducted at secondary education levels, universities, and non-educational organizations, so empirical evidence in the elementary school context is still relatively limited (Allassaf et al., [2020](#); Achdiat et al., [2023](#)). This situation suggests that the relationship between transformational leadership, organizational culture, knowledge sharing, and teachers' innovative behavior still requires further testing in a more comprehensive model.

The urgency of this research is further strengthened when linked to the state of educational innovation in Indonesia. Despite the implementation of various educational transformation policies, national innovation capacity still faces challenges, as reflected in Indonesia's position on the Global Innovation Index, which indicates that the innovation ecosystem has not yet developed optimally (Kumar et al., [2021](#)). In the education sector, various studies also report that teachers' innovative behavior remains inadequate, particularly in generating new ideas, implementing learning innovations, and conducting ongoing reflection on teaching practices (Nguyen & Hong, [2026](#)). These conditions indicate that improving the quality of education requires not only improving individual teacher competencies but also school leadership, organizational culture, and knowledge-sharing systems capable of creating an innovative work environment.

This phenomenon was also found in elementary schools in South Solok Regency. Education Report data shows that the region's educational quality achievement is still below that of several other regencies in West Sumatra Province, particularly in indicators related to learning quality, transformational leadership, and learning reflection. Furthermore, preliminary studies indicate that although teachers are relatively active in promoting ideas, their ability to generate new ideas and reflect on learning practices remains relatively low. This condition is reinforced by field phenomena such as suboptimal transformational leadership of school principals, an organizational culture that does not fully support collaboration and change, and limited knowledge sharing practices, thus hindering the development of teachers' potential for innovation. These empirical facts demonstrate

the need for studies that can explain the mechanisms of the relationship between these variables in the context of elementary schools.

Based on the description, this study aims to analyze the influence of principals' transformational leadership and organizational culture on teachers' innovative behavior by placing knowledge sharing as a mediating variable in elementary school teachers in South Solok Regency. This study is expected to provide theoretical contributions through the development of a model of teacher innovative behavior that integrates the perspectives of transformational leadership, organizational culture, and knowledge sharing in one conceptual framework. From a practical perspective, the results of the study are expected to be a basis for school principals, local governments, and educational policy makers in designing strategies to strengthen teachers' innovation culture through developing school leadership, creating a collaborative organizational culture, and strengthening sustainable knowledge sharing practices in elementary school environments. While the relationships among transformational leadership, organizational culture, and innovative behavior have been well-established in prior research, this study does not merely re-examine the direct links between these variables. Its novelty lies in elucidating the mechanism by which a principal's transformational leadership and the school's organizational culture translate into teacher innovative behavior, with knowledge sharing serving as the mediating mechanism. In a school setting, transformational leadership and organizational culture do not automatically yield innovation; rather, they first foster the social and psychological conditions that encourage teachers to exchange experiences, knowledge, skills, instructional strategies, and best practices. This process transforms individual knowledge into collective knowledge, enabling teachers to identify opportunities, generate ideas, garner support for those ideas, and both implement and reflect upon instructional innovations. Consequently, knowledge sharing is positioned not merely as an auxiliary variable, but as a crucial mechanism bridging the influence of the leadership environment and organizational culture on teachers' innovative behavior.

The study's novelty also stems from testing this model within the context of elementary schools in South Solok Regency, a setting with empirical characteristics distinct from the educational organizational contexts frequently studied in the past. Preliminary observations indicate that teachers' innovative behavior has not yet fully matured, particularly regarding the generation of new ideas and reflection on instructional practices. Simultaneously, knowledge sharing among teachers remains limited; many tend to hoard their experiences and instructional strategies as individual knowledge, while professional forums such as Teacher Working Groups (KKG) and staff meetings are not yet fully utilized as spaces for sharing best practices. These conditions reveal a gap between the need for instructional innovation and the school organization's capacity to cultivate the knowledge-sharing processes that support such innovation. Therefore, empirical testing involving elementary school teachers in South Solok Regency is essential to determine whether transformational leadership and organizational culture can enhance innovative behavior either directly or through knowledge sharing as a mediating mechanism. Thus, this study offers not only evidence regarding the relationships between these variables but also a contextual understanding of the organizational processes that drive the development of innovative behavior among elementary school teachers.

## Method

This study uses a quantitative approach with a causal design through a survey method to analyze the relationship between the principal's transformational leadership, organizational culture, *knowledge sharing*, and innovative behavior of teachers (Al-Ababneh, 2020; Rana et al., 2023; Li et al., 2023). The research model places the principal's transformational leadership ( $X_1$ ) and organizational culture ( $X_2$ ) as exogenous variables, *knowledge sharing* ( $Z$ ) as a mediating variable (*intervening*), and teacher innovative behavior ( $Y$ ) as endogenous variables (Sliwka et al., 2024). This approach was chosen because it allows testing of direct and indirect influences between variables in a structural model.

The study population was all public elementary school teachers in South Solok Regency in the 2025/2026 academic year who were Civil Servants (PNS) and Government Employees with Work Agreements (PPPK), totalling 1,190 teachers spread across 106 schools in seven sub-districts. The sample size was determined using the Krejci and Morgan table at a 95% confidence level, resulting in 291 respondents. The sampling technique used *stratified proportional random sampling* based on school accreditation to ensure representation of each stratum, then respondents in each stratum were selected randomly (*proportional random sampling*). The distribution of the population and research sample is presented in Table 1.

**Table 1.** Population Distribution and Research Sample

| School Accreditation | Number of Teachers | Number of Samples |
|----------------------|--------------------|-------------------|
| A                    | 295                | 72                |
| B                    | 769                | 188               |
| C                    | 119                | 29                |
| Not Yet Accredited   | 7                  | 2                 |
| Total                | 1.190              | 291               |

Source: Data from the South Solok Regency Education Office (2025), processed by researchers.

Data were collected using a closed-ended questionnaire with a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The research instrument was developed based on indicators validated in previous research. Transformational leadership variables were measured through four dimensions: *idealized influence*, *inspirational motivation*, *intellectual stimulation*, and *individualized consideration*. Organizational culture is measured through the dimensions of innovation and risk-taking, attention to detail, results orientation, people orientation, team orientation, aggressiveness, and organizational stability. *Knowledge sharing* measured through two dimensions, namely *knowledge donating* and *knowledge collecting*, while teachers' innovative behavior is measured through five dimensions, namely *opportunity exploration*, *idea generation*, *idea promotion*, *idea realization*, And *reflection*. The operational definition of each variable is presented in Table 2. Before being used in the main study, the instrument was piloted on 30 teachers outside the research sample to test its validity and reliability.

**Table 2.** Operational Definition of Research Variables

| Variables                       | Dimensions/Indicators   | Number of Items |
|---------------------------------|-------------------------|-----------------|
| Teacher Innovative Behavior (Y) | Opportunity Exploration | 5               |
|                                 | Idea Generation         | 5               |
|                                 | Idea Promotion          | 5               |

|                                               |                                      |    |
|-----------------------------------------------|--------------------------------------|----|
|                                               | Idea Realization                     | 5  |
|                                               | Reflection                           | 5  |
|                                               | Total                                | 25 |
| Transformational Leadership (X <sub>1</sub> ) | Idealized Influence                  | 5  |
|                                               | Inspirational Motivation             | 5  |
|                                               | Intellectual Stimulation             | 5  |
|                                               | Individualized Consideration         | 5  |
|                                               | Total                                | 20 |
| Organizational Culture (X <sub>2</sub> )      | Shared Values and Vision             | 5  |
|                                               | Collaboration Between Teachers       | 5  |
|                                               | Openness to Change                   | 5  |
|                                               | Support and Trust                    | 5  |
|                                               | Continuous Learning                  | 5  |
|                                               | Total                                | 25 |
| Knowledge Sharing (Z)                         | Sharing Explicit Knowledge           | 5  |
|                                               | Sharing Tacit Knowledge              | 5  |
|                                               | Willingness to Share Knowledge       | 5  |
|                                               | Professional Collaboration Intensity | 5  |
|                                               | Utilization of Knowledge             | 5  |
|                                               | Total                                | 25 |

Source: Researcher Analysis

The research was conducted in three stages: preparation, implementation, and reporting. The preparation stage included problem identification, literature review, development of a conceptual framework, hypotheses, and research instruments, as well as instrument validity and reliability testing. The implementation stage included obtaining research permits, determining samples, distributing questionnaires to respondents, and the data collection process. *Editing, coding, and data tabulation.* The final stage includes data analysis, discussion of research results, preparation of conclusions, and formulation of research implications.

Data analysis was carried out using the Partial Least Squares Structural Equation Modelling (PLS-SEM) approach with the help of Smart PLS 4 software. The analysis includes evaluation of the measurement model (*outer model*) and structural models (*inner model*) (Sarstedt et al., 2021). Evaluation *outer model* done through testing *convergent validity* using values *outer loading* and *Average Variance Extracted* ( $AVE \geq 0,50$ ), *discriminant validity* using the Furnell–Larker criteria, *cross loading*, and *Heterotrait-Monotrait Ratio* (HTMT), as well as construct reliability based on values *Composite Reliability* and *Cronbach's Alpha* ( $\geq 0.70$ ) (Edeh et al., 2023). Next, evaluate *inner model* carried out by testing the coefficient of determination ( $R^2$ ), effect size ( $f^2$ ), *model fit* use *Standardized Root Mean Square Residual* (SRMR) and *Normed Fit Index* (NFI), as well as hypothesis testing using procedures *bootstrapping*. The evaluation criteria for the PLS-SEM model are presented in Table 3. The hypothesis is declared accepted if the value *t-statistic* > 1.96 and *p-value* < 0.05 at a significance level of 5%.

**Table 3.** PLS-SEM Model Evaluation Criteria

| Testing Aspects                               | Criteria                                                              |
|-----------------------------------------------|-----------------------------------------------------------------------|
| Outer Loading                                 | $\geq 0,70$                                                           |
| Average Variance Extracted (AVE)              | $\geq 0,50$                                                           |
| Composite Reliability                         | $\geq 0,70$                                                           |
| Cronbach's Alpha                              | $\geq 0,70$                                                           |
| Heterotrait-Monotrait Ratio (HTMT)            | $< 0,90$                                                              |
| Fornell–Larcker Criterion                     | The AVE root value is greater than the correlation between constructs |
| Coefficient of Determination ( $R^2$ )        | 0.25 = weak; 0.50 = medium; 0.75 = strong                             |
| Effect Size ( $f^2$ )                         | 0.02 = small; 0.15 = medium; 0.35 = large                             |
| Standardized Root Mean Square Residual (SRMR) | $< 0,08$                                                              |
| Normed Fit Index (NFI)                        | Approaching 1.00                                                      |
| Significance of the Path                      | $t > 1.96$ and $p < 0,05$                                             |

The questionnaire items were developed and adapted to the elementary-school context based on the theoretical dimensions and indicators identified in previous studies. The items were reviewed through consultation with the research supervisors and subsequently pilot-tested on 30 teachers who were not included in the main sample to assess item clarity and instrument quality. Before data collection, research permission was obtained from the relevant educational authorities and participating schools. Respondents were informed about the purpose of the study and the procedures for completing the questionnaire before participation.

## Result and Discussion

### *Respondent Characteristics*

This study involved 291 public elementary school teachers in South Solok Regency, selected using a stratified proportional random sampling technique based on school accreditation. This technique was applied to ensure that each accreditation group obtained a representative sample proportion, reflecting the population of 1,190 teachers in 133 schools. The majority of respondents came from schools with B accreditation, followed by those with A, C, and unaccredited schools.

**Table 4.** Distribution of Respondents Based on School Accreditation

| Accreditation      | Number of Teachers Population | Sample |
|--------------------|-------------------------------|--------|
| A                  | 295                           | 72     |
| B                  | 769                           | 188    |
| C                  | 119                           | 29     |
| Not Yet Accredited | 7                             | 2      |
| Total              | 1.190                         | 291    |

Source: South Solok Regency Education Office

### *Evaluation of Measurement Model (Outer Model)*

Measurement model testing was conducted to ensure construct validity and reliability through convergent validity, discriminant validity, and construct reliability testing. The analysis results showed that all indicators had outer loading values between 0.686–0.874, thus all indicators met the convergent validity criteria (loading  $> 0.60$ ). The square root of Average Variance Extracted (AVE) values for all constructs were greater than the inter-construct correlation based on the Fornell–

Larcker Criterion, while all HTMT values were below the tolerance limit of 0.95. In addition, the cross-loading results showed that each indicator had the highest loading value on the construct it measured. The construct reliability also showed excellent results. Cronbach's Alpha values ranged from 0.818 to 0.878, while Composite Reliability values ranged from 0.873 to 0.911, all exceeding the minimum threshold of 0.70. Thus, all constructs were declared valid and reliable, making them suitable for use in structural model analysis.

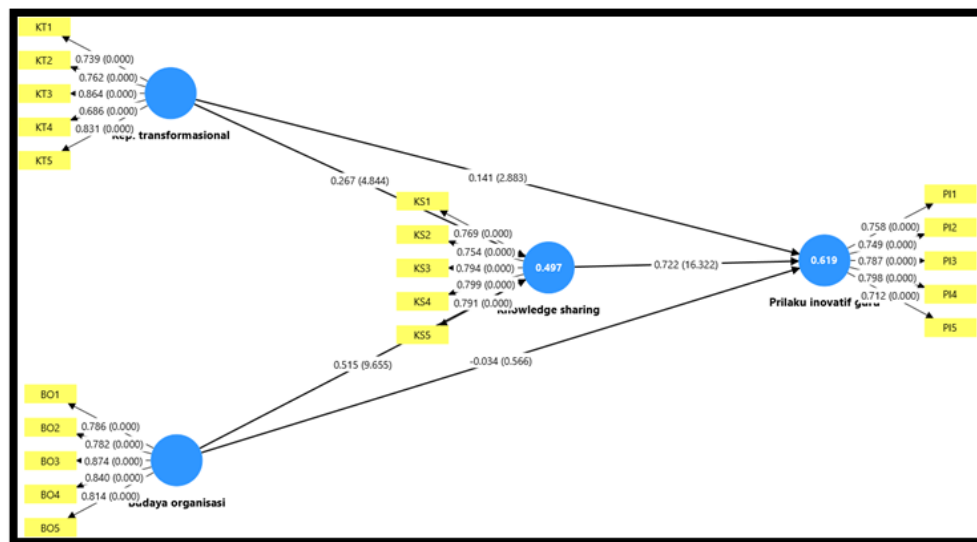
**Table 5.** Summary of Measurement Model Evaluation

| Construct                   | Outer Loading | Cronbach's Alpha | Composite Reliability | Information        |
|-----------------------------|---------------|------------------|-----------------------|--------------------|
| Transformational Leadership | 0,686–0,864   | 0,837            | 0,885                 | Valid and Reliable |
| Organizational culture      | 0,782–0,874   | 0,878            | 0,911                 | Valid and Reliable |
| Knowledge Sharing           | 0,754–0,799   | 0,841            | 0,887                 | Valid and Reliable |
| Teacher Innovative Behavior | 0,712–0,798   | 0,818            | 0,873                 | Valid and Reliable |

Source: Analysis Smart PLS by Researchers

### **Structural Model Evaluation (Inner Model)**

The structural model showed good predictive ability. The  $R^2$  value of 0.619 indicates that 61.9% of the variation in teachers' innovative behavior can be explained by transformational leadership, organizational culture, and knowledge sharing. Meanwhile, the  $R^2$  value of knowledge sharing of 0.497 indicates that 49.7% of the variation is explained by transformational leadership and organizational culture. The effect size ( $f^2$ ) value shows that the largest influence comes from Knowledge Sharing on Teachers' Innovative Behavior ( $f^2 = 0.687$ ), followed by the influence of Organizational Culture on Knowledge Sharing ( $f^2 = 0.350$ ). The influence of transformational leadership on knowledge sharing is small to moderate ( $f^2 = 0.094$ ), while the direct influence of transformational leadership ( $f^2 = 0.031$ ) and organizational culture ( $f^2 = 0.001$ ) on teachers' innovative behavior is relatively small. The results of the model fit test showed an SRMR value of 0.080 which met the acceptance limit ( $<0.08$ ) and an NFI of 0.745, so the model was assessed as having an adequate level of suitability.



**Figure 1.** Research Model Bootstrapping Results (Smart PLS)

Figure 1 shows the relationships between variables in the research model along with the path coefficient values from bootstrapping. These results indicate that most of the relationships between variables are positive and significant, except for the direct influence of organizational culture on teacher innovative behavior.

### Hypothesis Testing

The results of the hypothesis testing showed that organizational culture had a positive and significant effect on knowledge sharing ( $\beta = 0.515$ ;  $t = 9.655$ ;  $p < 0.001$ ). Transformational leadership also had a positive and significant effect on knowledge sharing ( $\beta = 0.267$ ;  $t = 4.844$ ;  $p < 0.001$ ) and on teachers' innovative behavior ( $\beta = 0.141$ ;  $t = 2.883$ ;  $p = 0.002$ ). Furthermore, knowledge sharing was the variable with the greatest influence on teachers' innovative behavior ( $\beta = 0.722$ ;  $t = 16.322$ ;  $p < 0.001$ ). Conversely, the direct effect of organizational culture on teachers' innovative behavior was not significant ( $\beta = -0.034$ ;  $t = 0.566$ ;  $p = 0.286$ ). The indirect effect analysis shows that knowledge sharing significantly mediates the relationship between organizational culture and teachers' innovative behavior ( $\beta = 0.372$ ;  $t = 8.012$ ;  $p < 0.001$ ) and the relationship between transformational leadership and teachers' innovative behavior ( $\beta = 0.193$ ;  $t = 4.838$ ;  $p < 0.001$ ). These results indicate that knowledge sharing plays an important role as a bridging mechanism between the influence of the two exogenous variables on teachers' innovative behavior.

**Table 6.** Summary of Hypothesis Testing Results

| Hypothesis                                                | b      | t      | p     | Results  |
|-----------------------------------------------------------|--------|--------|-------|----------|
| Transformational Leadership → Teacher Innovative Behavior | 0,141  | 2,883  | 0,002 | Accepted |
| Organizational Culture → Teacher Innovative Behavior      | -0,034 | 0,566  | 0,286 | Rejected |
| Transformational Leadership → Knowledge Sharing           | 0,267  | 4,844  | 0,000 | Accepted |
| Organizational Culture → Knowledge Sharing                | 0,515  | 9,655  | 0,000 | Accepted |
| Knowledge Sharing → Teacher Innovative Behavior           | 0,722  | 16,322 | 0,000 | Accepted |

|                                                 |       |       |       |          |
|-------------------------------------------------|-------|-------|-------|----------|
| Transformational Leadership → Knowledge Sharing | 0,193 | 4,838 | 0,000 | Accepted |
| Organizational Culture → Knowledge Sharing      | 0,372 | 8,012 | 0,000 | Accepted |

Overall, six of the seven research hypotheses were accepted, while one hypothesis, namely the direct influence of organizational culture on teachers' innovative behavior, was rejected. These findings confirm that knowledge sharing is the most dominant factor in increasing teachers' innovative behavior and also acts as a mediating variable in the relationship between transformational leadership and organizational culture on teachers' innovative behavior.

### Discussion

The present study investigated the relationships among principal transformational leadership, organizational culture, knowledge sharing, and teacher innovative behavior among public elementary school teachers in South Solok Regency. The findings reveal a differentiated organizational mechanism underlying teacher innovation. Transformational leadership was positively associated with both teacher innovative behavior ( $\beta = 0.141$ ,  $t = 2.883$ ,  $p = 0.002$ ) and knowledge sharing ( $\beta = 0.267$ ,  $t = 4.844$ ,  $p < 0.001$ ), whereas organizational culture exhibited a substantial positive association with knowledge sharing ( $\beta = 0.515$ ,  $t = 9.655$ ,  $p < 0.001$ ) but no significant direct relationship with innovative behavior ( $\beta = -0.034$ ,  $t = 0.566$ ,  $p = 0.286$ ). Most importantly, knowledge sharing emerged as the strongest correlate of teacher innovative behavior ( $\beta = 0.722$ ,  $t = 16.322$ ,  $p < 0.001$ ;  $f^2 = 0.687$ ). The significant indirect pathways from transformational leadership through knowledge sharing ( $\beta = 0.193$ ) and from organizational culture through knowledge sharing ( $\beta = 0.372$ ) further suggest that leadership and cultural conditions become particularly relevant to innovation when translated into professional knowledge exchange. The model explained 49.7% of the variance in knowledge sharing and 61.9% of the variance in innovative behavior, indicating substantial explanatory power within the investigated educational context.

The positive relationship between transformational leadership and teacher innovation is consistent with a growing international literature demonstrating that school leadership facilitates innovation not merely through formal authority but through motivational, relational, and professional-learning processes. Vermeulen et al. (2022) found that transformational leadership was embedded within relationships involving leader-member exchange and school learning climate in explaining teachers' innovative behavior in the Netherlands. Similarly, Kılınç et al. (2024) demonstrated that transformational leadership was connected to teachers' innovative practices through teacher commitment, with trust in the principal shaping the strength of these relationships. Bao (2024) likewise found that principal transformational leadership was associated with teacher innovative behavior through teachers' sense of meaning at work, indicating that leadership operates partly through proximal psychological mechanisms rather than exclusively through direct behavioral effects. These findings support the relatively modest direct coefficient identified in South Solok and suggest that the influence of transformational leadership becomes more intelligible when intermediate professional and psychological mechanisms are explicitly modelled.

The central role of knowledge sharing is even more strongly supported by international evidence. Al-Husseini et al. (2021) reported that knowledge sharing mediated the relationship

between transformational leadership and innovation among higher-education faculty, whereas Saif et al. (2024) similarly found transformational leadership to be associated with innovative work behavior through knowledge sharing. Rafique et al. (2022), retained from the previous discussion, further showed that knowledge sharing operated as both a mediating and contextual mechanism connecting leadership conditions with innovative work behavior. Beyond education, Ouakouak et al. (2021) demonstrated that reciprocal openness to receiving and providing knowledge promoted knowledge sharing and subsequently supported innovation performance, while Xia et al. (2021) found that collaborative knowledge sharing facilitated innovation performance among globally distributed teams. These studies collectively reinforce the interpretation that knowledge becomes organizationally valuable not simply because it exists but because it is circulated, received, recombined, and converted into practice.

The present finding is especially compatible with Arslan et al. (2026), who investigated 405 teachers in Türkiye and found that learning-centred principal leadership enhanced innovative teaching practices both directly and indirectly through teacher knowledge sharing. Their findings closely parallel the South Solok model and provide recent cross-national evidence that knowledge exchange can function as a proximal pathway linking school leadership with innovation. Similarly, Kılınç et al. (2022) found that teacher collaboration mediated the relationship between learning-centred leadership and changes in instructional practice, while Bellibaş and Gümüş (2023) demonstrated that learning-centred leadership contributed to teacher professional learning through relational organizational conditions. Such findings reinforce the view that leadership effects are often socially mediated: leaders may establish direction and support, but innovation is enacted through collaborative professional processes.

The non-significant direct path from organizational culture to innovative behavior is also theoretically informative. Rather than contradicting organizational-culture theory, this finding suggests that culture may operate primarily as an enabling architecture. Azeem et al. (2021) demonstrated that organizational culture fosters knowledge sharing and organizational innovation, suggesting that cultural values become productive when translated into knowledge-related organizational practices. Xu and Suntrayuth (2022) similarly found that organizational innovation climate influenced innovative work behavior through psychological safety and knowledge sharing. Furthermore, Xu et al. (2023) showed that innovative culture functioned in a sequential mechanism linking innovation-oriented organizational systems with intrinsic motivation and innovative work behavior. Consequently, the South Solok result may indicate that shared values, trust, collaboration, openness to change, and continuous learning do not automatically produce observable innovation unless they activate behavioral processes through which professional knowledge is exchanged and utilized.

Evidence specifically concerning teachers further supports this process-oriented interpretation. Cai and Tang (2021), based on 1,123 teachers in China, showed that colleague and student support were positively related to teacher innovation and that self-efficacy mediated important aspects of these relationships. Their subsequent study involving 1,115 teachers showed that satisfaction of psychological needs, particularly relatedness and competence, constituted important mechanisms through which school support was associated with teacher innovation (Cai & Tang, 2022). Blömeke et al. (2021), using TALIS data from 48 countries and more than 150,000 teachers, similarly associated school innovativeness with stronger teacher collaboration, innovative

classroom practices, and job satisfaction. Collectively, these studies indicate that innovation is embedded in a social ecology rather than being reducible to individual creativity or formal leadership alone.

The findings are also consistent with the emerging conceptual literature on teacher innovation. Liu et al. (2024), in a systematic review of 109 studies, emphasized the conceptual multidimensionality of teacher innovation and highlighted the need for more theory-driven examinations of its underlying mechanisms. Kuril et al. (2023), using an exceptionally large public-school teacher sample in India, likewise validated teacher innovative behavior as a multidimensional construct rather than a simple willingness to adopt new practices. This perspective aligns well with the current study, in which innovative behavior encompasses opportunity exploration, idea generation, idea promotion, idea realization, and reflection. Knowledge sharing may therefore be influential because it potentially contributes to several stages of the innovation process simultaneously: teachers encounter new ideas, compare experiences, mobilize support, refine possible solutions, and disseminate practices through professional interaction.

Within Indonesia, the findings extend rather than simply reproduce previous evidence. Sudibjo and Prameswari (2021) found among private elementary teachers in South Jakarta that transformational leadership did not significantly predict innovative work behavior directly, but became relevant through knowledge sharing. The South Solok findings differ in showing both a significant direct pathway and a significant indirect pathway, suggesting that the leadership–innovation relationship may be context-dependent. Differences between metropolitan private schools and public elementary schools distributed across a non-metropolitan regency may reflect variations in organizational hierarchy, leadership visibility, professional networks, access to development opportunities, and dependence on collegial resources. Nevertheless, both studies converge strongly in positioning knowledge sharing as a critical mechanism connecting school organizational conditions with teacher innovation.

The results are also consistent with Indonesian studies emphasizing collaboration and knowledge circulation in educational transformation. Febriantina et al. (2025) demonstrated that transformational leadership supported innovative work behavior through knowledge sharing in an Indonesian higher-education setting, while recent work on educational technology and teacher professional development has similarly indicated that institutional innovation depends on the interaction between professional competence, organizational support, and knowledge-based practices rather than technology alone (Al Khansa et al., 2024; Waluyo et al., 2025; Hariandini et al., 2026). Studies involving interactive digital learning resources likewise show that technological or instructional innovation gains educational value when it is embedded within appropriate pedagogical and organizational processes (Pribowo et al., 2024; Rasyid et al., 2025). Thus, the present study contributes to Indonesian evidence by demonstrating that, in elementary-school organizational settings, knowledge sharing may constitute the mechanism through which favorable leadership and cultural resources are converted into teachers' innovative professional practices.

Theoretically, the findings refine transformational leadership, organizational-culture, and knowledge-creation perspectives by distinguishing distal organizational resources from proximal social processes. Transformational leadership may provide direction, intellectual stimulation, individual consideration, and encouragement, whereas organizational culture establishes shared expectations concerning collaboration, trust, learning, and openness; nevertheless, knowledge

sharing appears to represent the process through which these resources become professionally actionable. This interpretation is compatible with Messmann et al. (2022), who showed that basic psychological need satisfaction helps explain the transformational leadership–innovative behavior relationship, as well as with distributed-leadership research demonstrating that professional collaboration and job satisfaction mediate leadership effects on teacher innovativeness (Buyukgoze et al., 2024). Pedagogically, schools should therefore institutionalize KKG activities, professional learning communities, peer observation, collaborative lesson planning, mentoring, reflective dialogue, instructional repositories, and regular forums for exchanging successful and unsuccessful instructional experiments. Such arrangements can convert tacit individual experience into collective professional knowledge and reduce dependence on isolated teacher experimentation. At the policy level, professional-development policy should move beyond episodic workshops toward sustained school-based knowledge infrastructures, leadership preparation, protected collaborative time, cross-school professional networks, and incentives for sharing pedagogical knowledge. Ninković and Knežević Florić (2024) similarly emphasize that school-leadership effects on instructional practice are frequently indirect, supporting policy approaches that develop organizational mechanisms rather than assuming that principal behavior alone will transform classroom practice.

The novelty of this study lies in testing transformational leadership, organizational culture, knowledge sharing, and innovative behavior simultaneously among public elementary school teachers in South Solok Regency, an educational context comparatively underrepresented in international leadership and innovation research. Existing international research increasingly demonstrates that leadership affects teacher innovation through mediators such as professional collaboration, commitment, self-efficacy, psychological safety, meaning at work, and knowledge exchange (Bao, 2024; Cai & Tang, 2021; Kılınç et al., 2024; Vermeulen et al., 2022). The present study contributes a distinctive structural pattern: transformational leadership retained both direct and knowledge-sharing-mediated associations, whereas organizational culture was related to innovative behavior predominantly through knowledge sharing. This finding advances a more process-sensitive interpretation of culture by suggesting that organizational values do not necessarily become innovative action until they are enacted through knowledge exchange. It also complements the broader literature in which learning-centred and distributed leadership enhance teacher innovation through collaboration and knowledge processes (Arslan et al., 2026; Bellibaş et al., 2020; Buyukgoze et al., 2024). Consequently, the study contributes not merely another test of whether leadership “affects” innovation, but a clearer account of how organizational resources may be translated into innovative professional behavior.

Several limitations delimit these conclusions. First, the cross-sectional design does not establish temporal or causal ordering; consequently, statistically significant indirect effects should be interpreted as evidence consistent with mediation rather than definitive proof of causal mediation. Second, leadership, organizational culture, knowledge sharing, and innovative behavior were all measured through teacher self-reports, creating potential common-method variance and social-desirability bias. Third, although the sample of 291 teachers provides adequate statistical power for the specified PLS-SEM model, participants were drawn exclusively from public elementary schools in one Indonesian regency, restricting broader generalization. Fourth, organizational culture and knowledge sharing are conceptually related constructs, requiring continuing attention to discriminant validity and potential construct overlap. Fifth, innovative behavior may also be shaped

by self-efficacy, psychological safety, professional autonomy, trust, commitment, digital competence, workload, leadership distribution, and school innovativeness, variables that were not included in the present model. Future research should therefore employ longitudinal and multilevel designs, distinguish school-level and teacher-level organizational influences, use multi-source assessments from principals, colleagues, and classroom observations, and incorporate professional-network data or objective evidence of instructional innovation. Comparative research across rural, urban, private, and public schools would further determine whether knowledge sharing retains its strong explanatory role across contexts. Longitudinal intervention studies that deliberately strengthen structured teacher knowledge-sharing systems would provide particularly valuable evidence regarding whether improvements in professional exchange precede and contribute to sustained innovative teaching behavior.

## Conclusion

This study examined how principals' transformational leadership and organizational culture relate to the innovative behavior of public elementary school teachers in South Solok Regency, with knowledge sharing positioned as a mediating mechanism. The findings demonstrate that transformational leadership is positively related to both teachers' innovative behavior and knowledge sharing, whereas organizational culture shows a significant positive relationship with knowledge sharing but no significant direct relationship with innovative behavior. Knowledge sharing emerged as the strongest factor associated with teachers' innovative behavior, with a path coefficient of 0.722 and a large effect size, and significantly mediated both the transformational leadership–innovative behavior and organizational culture–innovative behavior relationships. The structural model explained 61.9% of the variance in teachers' innovative behavior and 49.7% of the variance in knowledge sharing, indicating that leadership, organizational culture, and knowledge-sharing processes jointly provide substantial explanatory value for understanding teacher innovation in the studied context. Theoretically, these findings reinforce the proposition that organizational conditions do not necessarily translate directly into innovative behavior; rather, knowledge sharing functions as an important social-organizational process through which leadership practices and cultural values can be transformed into the exchange of experiences, instructional strategies, professional knowledge, and ideas that support innovation. Practically, schools should therefore complement transformational leadership development and collaborative organizational culture with systematic mechanisms for knowledge exchange, including professional learning communities, Teacher Working Groups, peer collaboration, reflective forums, and structured sharing of instructional practices. Nevertheless, the findings should be interpreted within the boundaries of a cross-sectional design, self-reported questionnaire data, and a sample restricted to public elementary school teachers in one regency, which limit causal inference and broader generalization. Future research should employ longitudinal, experimental, or mixed-method designs, involve teachers across different educational levels and geographical contexts, incorporate additional individual and organizational variables, and use multiple data sources to clarify how knowledge-sharing processes develop over time and translate organizational resources into sustained innovative teaching practices. Overall, the study advances understanding of teacher innovative behavior by identifying knowledge sharing as a pivotal mechanism connecting school leadership and organizational culture with innovation in elementary education.

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