

How School Resources Become Teacher Innovation: Self-Efficacy as a Mediating Mechanism in Public Elementary Schools

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ABSTRACT

Teacher innovation is not produced by individual creativity alone; it emerges when school resources are converted into confidence and sustained professional action. This study examined teacher self-efficacy as a mediating mechanism linking transformational leadership, organizational learning, and work motivation to innovative work behavior. A quantitative cross-sectional survey was conducted from December 2025 to May 2026 with 374 public elementary-school teachers from 29 subdistricts of Serang Regency, Indonesia. Five reflective constructs were measured with 105 Likert-scale items and analyzed using partial least squares structural equation modeling in SmartPLS 4.1.1. The measurement model demonstrated high internal consistency ($\alpha = .966-.974$; composite reliability = .969-.976) and adequate convergent and discriminant validity. The structural model explained 21.0% of teacher self-efficacy and 54.5% of innovative work behavior, with SRMR = .036. Transformational leadership ($\beta = .176$), organizational learning ($\beta = .189$), and work motivation ($\beta = .225$) positively predicted self-efficacy, while self-efficacy strongly predicted innovative work behavior ($\beta = .368$). All direct effects on innovative behavior remained significant. Specific indirect effects were .065, .070, and .083, indicating complementary partial mediation; motivation showed the largest mediated proportion (32.81%), whereas organizational learning produced the largest total effect (.317). The findings position self-efficacy as a psychological transmission channel rather than a substitute for supportive school conditions. School improvement should combine transformational principal practices, structured professional learning, motivation-supportive work design, and mastery-oriented coaching.

INTRODUCTION

Curriculum renewal, digital transformation, and increasingly diverse learning needs require public elementary-school teachers to do more than deliver established lessons. They must identify emerging problems, generate possible solutions, mobilize support, implement new practices, and evaluate whether those practices improve learning. These activities correspond to innovative work behavior, a multi-stage form of professional action that moves from idea generation to idea promotion and implementation (de Jong & den Hartog, 2010; AlEssa & Durugbo, 2022). In schools, innovative work behavior may appear in differentiated instruction, locally developed learning media, formative assessment routines, data-informed remediation, or new forms of collaboration with families.

The practical importance of innovation is clear, yet its organizational origins are frequently understated. Innovation is often treated as the product of a creative teacher or a short training program. That view is incomplete because teachers work inside systems that can legitimize experimentation or punish it, circulate knowledge or isolate it, and sustain effort or exhaust it. Recent studies associate teacher innovation with leadership, school climate, professional agency, digital competence, collaboration, and self-efficacy (Sary et al., 2023; Hidayat & Patras, 2024; Hsieh et al., 2024). The central analytical question is therefore not only whether teachers possess innovative potential, but how school conditions become confident and persistent action in classrooms.

Transformational leadership represents a managerial resource for innovation. Principals who communicate a credible direction, stimulate professional thinking, model commitment, and provide individualized support can make improvement-oriented risk taking legitimate (Bass & Riggio, 2006). They can also protect time for experimentation, connect individual ideas to school priorities, and provide feedback after early implementation. Evidence from educational and organizational settings shows that transformational leadership is associated with innovative behavior, knowledge sharing, and learning-oriented change (Khalili, 2016; Sudibjo & Prameswari, 2021; Saif et al., 2024). However, leadership messages are unlikely to become daily practice unless schools also possess routines for collective learning.

Organizational learning provides this social infrastructure. It refers to processes through which members acquire, exchange, interpret, retain, and apply knowledge. In schools, organizational learning is visible when teachers jointly examine student work, observe lessons, discuss unsuccessful trials, document useful resources, and revise practices through evidence. Such routines make innovation less dependent on isolated individuals and allow ideas to be tested collectively. Research on teacher communities and sustainable educational change indicates that collaboration is productive when it is focused on practice, supported by leadership, and connected to continuous inquiry (Vangrieken et al., 2017; Fix et al., 2021).

Work motivation contributes a personal resource that sustains discretionary effort. Innovation frequently adds temporary workload, produces uncertain outcomes, and demands persistence after setbacks. Self-determination theory

proposes that high-quality motivation is strengthened when workers experience autonomy, competence, and relatedness (Ryan & Deci, 2020). Teachers who perceive their work as meaningful and who retain agency in instructional decisions are more likely to search for information, persist with difficult changes, and improve an initial idea rather than abandon it. Empirical research likewise links intrinsic motivation and occupational self-efficacy with innovative teacher behavior (Klaeijsen et al., 2018).

The influence of these three resources may be transmitted through teacher self-efficacy. Self-efficacy is a context-sensitive judgment that one can organize and execute the actions required to attain a goal (Bandura, 1997). In teaching, it concerns confidence in engaging students, managing classrooms, adapting instruction, and overcoming learning difficulties (Tschannen-Moran & Hoy, 2001). It matters for innovation because new practice requires teachers to act before results are certain. Strong efficacy beliefs encourage effort, adaptive problem solving, and persistence, whereas weak efficacy can cause potentially useful ideas to remain untested. Leadership can strengthen efficacy through credible encouragement and protected mastery opportunities; organizational learning provides models and feedback; and motivation sustains the effort needed to transform confidence into action.

Existing studies support individual parts of this explanation but leave three gaps. First, leadership, organizational learning, motivation, and self-efficacy are often analyzed separately, making it difficult to compare their roles inside one system. Second, many studies report direct relationships without decomposing how much of each antecedent's total effect operates through self-efficacy. Third, public elementary schools in decentralized education systems remain underrepresented, despite their resource constraints and high responsibility for foundational learning. A mediation-centered analysis can address these gaps by showing not merely which factor is significant, but how school resources are converted into innovative behavior.

This article therefore reframes the school as an innovation engine: leadership supplies direction and legitimacy, organizational learning supplies collective knowledge, motivation supplies energy, and self-efficacy functions as a transmission mechanism that converts those resources into classroom action. The study asks: (1) To what extent do transformational leadership, organizational learning, and work motivation predict teacher self-efficacy? (2) Does self-efficacy predict innovative work behavior after the direct effects of the three antecedents are considered? and (3) Are the indirect effects through self-efficacy complementary partial mediations? The contribution is mechanism-centered rather than merely predictive, providing both an explanation of teacher innovation and an intervention architecture for school management.

LITERATURE REVIEW

Transformational Leadership and Innovative Work Behavior

Transformational leadership influences behavior by aligning individual effort with a meaningful collective purpose. Idealized influence establishes credibility, inspirational motivation clarifies direction, intellectual stimulation

challenges routine assumptions, and individualized consideration supports professional growth (Bass & Riggio, 2006). For teachers, these behaviors can reduce uncertainty around experimentation and communicate that responsible innovation is legitimate work. Transformational leaders may also supply resources, remove procedural barriers, and recognize learning from unsuccessful trials.

The expected effect is both direct and efficacy-based. Directly, principals can modify priorities, schedules, access to materials, and collaboration opportunities. Indirectly, their feedback and confidence in teachers can strengthen judgments of capability. Studies have found associations between transformational leadership, supportive school climate, knowledge sharing, and teacher innovativeness (Sudibjo & Prameswari, 2021; Hidayat & Patras, 2024). This study consequently expects transformational leadership to predict innovative work behavior and teacher self-efficacy, with self-efficacy transmitting part of the leadership effect.

Organizational Learning as Innovation Infrastructure

Organizational learning transforms individual experience into collective capacity. The learning-organization perspective emphasizes continuous learning, inquiry and dialogue, team learning, embedded systems, empowerment, connection with the environment, and strategic leadership for learning (Marsick & Watkins, 2003). In schools, these dimensions are enacted through professional learning communities, lesson inquiry, peer observation, collaborative planning, and repositories of tested resources.

Learning routines can influence innovation directly by improving idea quality and reducing the cost of implementation. Teachers gain access to examples, critical feedback, and colleagues who can help promote an idea. They can also strengthen self-efficacy through vicarious experience and social persuasion. When a credible peer demonstrates a feasible practice, an unfamiliar task becomes more attainable. Because teacher collaboration is not automatically productive, the strongest effects are expected when interaction is structured around evidence and practice rather than administrative exchange (Vangrieken et al., 2017; Fix et al., 2021).

Work Motivation, Persistence, and Innovation

Innovative behavior is discretionary and effort intensive. Even when a school permits experimentation, teachers must allocate attention, tolerate ambiguity, and continue through revision cycles. Motivation determines the direction, intensity, and persistence of that effort. Self-determination theory distinguishes autonomous motivation, grounded in interest and personally endorsed values, from controlled motivation, driven primarily by pressure or contingent rewards (Ryan & Deci, 2020). Autonomous motivation is particularly relevant to innovation because it supports exploration and persistence without constant external monitoring.

Motivation can also reinforce efficacy. Sustained engagement creates mastery experiences, while progress confirms that effort can produce results. Conversely, repeated overload without autonomy may weaken both motivation and confidence. Prior evidence linking need satisfaction, intrinsic motivation, occupational self-efficacy, and innovative behavior supports the expectation that

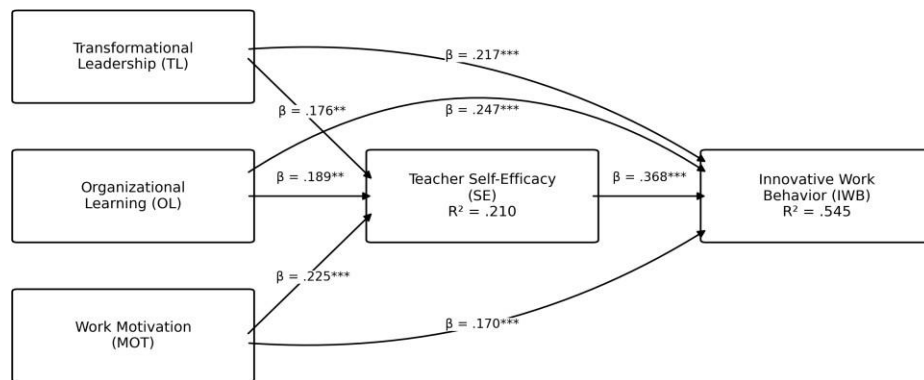
work motivation has direct and self-efficacy-mediated effects on teacher innovation (Klaeijnsen et al., 2018).

Teacher Self-Efficacy as a Psychological Transmission Mechanism

Social cognitive theory explains that behavior is shaped through reciprocal relationships among personal beliefs, action, and environmental conditions (Bandura, 1997). Self-efficacy is central because it affects goal choice, effort, resilience, and interpretation of setbacks. In innovation, efficacy beliefs influence whether a teacher converts an idea into a trial and whether the trial is improved after initial difficulties. Recent studies identify self-efficacy as an important predictor of teacher innovativeness and as part of mediated models involving personality, climate, leadership, or professional resources (Pan et al., 2021; Gkontelos et al., 2023; Aryani et al., 2024).

Mediation is expected to be partial rather than complete. Leadership, organizational learning, and motivation can affect innovative behavior through mechanisms other than confidence, including resource access, social support, knowledge availability, incentives, and persistence. Complementary partial mediation would therefore indicate that self-efficacy strengthens rather than replaces contextual and motivational pathways. Figure 1 presents the analytical model.

Figure 1. Mediation model with standardized path coefficients



** p = .001; *** p < .001

The model tested direct paths from transformational leadership, organizational learning, and work motivation to self-efficacy and innovative work behavior; a path from self-efficacy to innovative work behavior; and three specific indirect effects. The hypotheses were: H1a-H1c, the three antecedents positively predict teacher self-efficacy; H2, self-efficacy positively predicts innovative work behavior; H3a-H3c, self-efficacy mediates the effects of each antecedent on innovative work behavior; and H4a-H4c, the corresponding direct effects remain positive after the mediator is included.

METHODOLOGY

Research Design and Analytical Focus

This study used a quantitative, cross-sectional, explanatory survey design to test a mediation model of teachers' innovative work behavior. The analysis was derived from the first author's doctoral dissertation and focused on whether teacher self-efficacy transmits the effects of transformational leadership,

organizational learning, and work motivation. PLS-SEM was appropriate because the model simultaneously estimated multiple reflective constructs, direct paths, and specific indirect effects while emphasizing explained variance. The study was conducted in public elementary schools in Serang Regency, Banten Province, Indonesia. The target population comprised 5,645 teachers working in 707 public elementary schools distributed across 29 subdistricts. The individual teacher was the unit of analysis. Transformational leadership and organizational learning represented teachers' perceptions of their school context, whereas work motivation, self-efficacy, and innovative work behavior represented individual-level perceptions and actions.

Participants, Sampling, and Data Collection

The minimum sample was calculated using the Slovin formula with a 5% margin of error, producing 374 respondents. The sample was allocated proportionally across the 29 subdistricts. The dissertation described respondent recruitment as accidental sampling within these proportional allocations; therefore, the design is reported transparently as proportionate allocation with convenience recruitment rather than as a fully probability-based sample. Eligible respondents were active public elementary-school teachers with sufficient experience to evaluate school leadership, learning routines, and their own professional behavior.

Data were collected from December 2025 to May 2026 through printed questionnaires and Google Forms. Participation was voluntary. Before questionnaire completion, respondents were informed about the study purpose, procedures, confidentiality, aggregate reporting, and the right to decline or withdraw without penalty. A total of 374 usable responses were analyzed. Ethical determination. Following institutional review, formal ethics committee approval was not required because the study was a minimal-risk, non-interventional survey involving adult teachers and did not collect clinical or other highly sensitive personal information. Institutional research permission was obtained from the relevant education authority and participating schools, and informed consent was documented before data collection.

Measures

The questionnaire used a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The instrument comprised 105 items, with 21 items for each construct: transformational leadership, organizational learning, work motivation, teacher self-efficacy, and innovative work behavior. Positive and negatively worded statements were included to reduce acquiescence.

Transformational leadership covered idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. Organizational learning covered continuous learning, dialogue and inquiry, team learning and collaboration, embedded systems, empowerment, system connection, and strategic leadership. Work motivation covered the needs for achievement, affiliation, and power. Self-efficacy covered magnitude, generality, and strength. Innovative work behavior covered idea generation, idea exploration, idea championing, and idea implementation.

Items were developed from the theoretical dimensions documented in the dissertation and reviewed for content relevance and readability by academics and educational practitioners. Construct validity was assessed through indicator loadings, average variance extracted, cross-loadings, and the Fornell-Larcker criterion. Internal consistency was evaluated using Cronbach's alpha, rho_A, and composite reliability.

Data Analysis

The analysis was performed in SmartPLS 4.1.1. The measurement model was evaluated using indicator loadings, AVE $\geq .50$, and composite reliability $\geq .70$. Indicators between .60 and .70 were retained when construct-level AVE and reliability remained adequate and the items preserved content coverage. Discriminant validity was evaluated using the Fornell-Larcker criterion and cross-loadings. The structural model was examined using R^2 , adjusted R^2 , standardized path coefficients, t statistics, p values, f^2 , SRMR, and NFI.

Direct and specific indirect effects were evaluated using bootstrapping at $\alpha = .05$. Complementary partial mediation was concluded when the direct and indirect effects were both positive and significant. The mediated proportion was summarized with variance accounted for (VAF = indirect effect / total effect). Stone-Geisser blindfolding and PLSpredict outputs were not preserved in the dissertation archive; therefore, predictive relevance is not claimed from manually derived Q^2 figures.

RESEARCH RESULT

Participant Characteristics and Descriptive Profile

The sample consisted of 179 men (47.86%) and 195 women (52.14%). Most respondents were 25-30 years old (36.63%) and held a bachelor's degree (79.14%). The largest tenure group had worked for 5-10 years (41.71%). All five constructs were rated in the high category: transformational leadership = 74.11%, organizational learning = 72.21%, work motivation = 73.49%, self-efficacy = 76.48%, and innovative work behavior = 73.71%. The comparatively high self-efficacy index provides a plausible descriptive context for its strong structural relationship with innovation.

Table 1. Participant characteristics (n = 374)

Characteristic	Category	n (%)
Gender	Men	179 (47.86%)
	Women	195 (52.14%)
Age	25-30 years	137 (36.63%)
	31-35 years	89 (23.80%)
	36-40 years	75 (20.05%)
	41-45 years	35 (9.36%)
	46-50 years	21 (5.61%)
	> 50 years	17 (4.55%)

Measurement Model

The measurement model met construct-level standards. Indicator loadings ranged from .688 to .864. Five indicators were marginally below .70 but remained above .60; they were retained because all constructs exceeded the AVE threshold and demonstrated very high internal consistency. AVE values ranged from .597 to .662, composite reliability ranged from .969 to .976, and rho_A ranged from .968 to .975. The square roots of AVE exceeded all inter-construct correlations, supporting discriminant validity under the Fornell-Larcker criterion.

Table 2. Measurement-model quality

Construct	Items	Loading range	α	CR	AVE
TL	21	.688-.864	.966	.969	.597
OL	21	.743-.860	.974	.976	.662
MOT	21	.715-.855	.970	.972	.626
SE	21	.693-.852	.967	.970	.606
IWB	21	.690-.861	.968	.971	.612

Note. TL = transformational leadership; OL = organizational learning; MOT = work motivation; SE = teacher self-efficacy; IWB = innovative work behavior. Very high alpha coefficients may indicate some item redundancy; scale refinement is recommended in future research.

Structural Model and Direct Effects

The structural model explained 21.0% of the variance in teacher self-efficacy (adjusted $R^2 = .204$) and 54.5% of the variance in innovative work behavior (adjusted $R^2 = .540$). Model fit was acceptable (SRMR = .036), while NFI = .826 indicated room for model improvement. All seven direct paths were positive and significant. Self-efficacy had the strongest proximal effect on innovative behavior ($\beta = .368$, $t = 9.143$, $p < .001$). Among the contextual antecedents, organizational learning had the largest direct effect on innovative behavior ($\beta = .247$), whereas work motivation had the largest effect on self-efficacy ($\beta = .225$).

Table 3. Direct structural effects

Hypothesis	Path	β	t	p
H1	TL $\rightarrow$ IWB	.217	5.489	< .001
H2	OL $\rightarrow$ IWB	.247	5.909	< .001
H3	MOT $\rightarrow$ IWB	.170	4.038	< .001
H4	TL $\rightarrow$ SE	.176	3.440	.001
H5	OL $\rightarrow$ SE	.189	3.361	.001
H6	MOT $\rightarrow$ SE	.225	4.523	< .001
H7	SE $\rightarrow$ IWB	.368	9.143	< .001

Note. All hypotheses were supported. Effect-size values were moderate for SE $\rightarrow$ IWB ($f^2 = .235$) and small for the remaining paths ($f^2 = .031-.093$).

Mediation and Effect Decomposition

Self-efficacy significantly mediated all three antecedent relationships. The indirect effect was .065 for transformational leadership, .070 for organizational learning, and .083 for work motivation. Because the corresponding direct effects

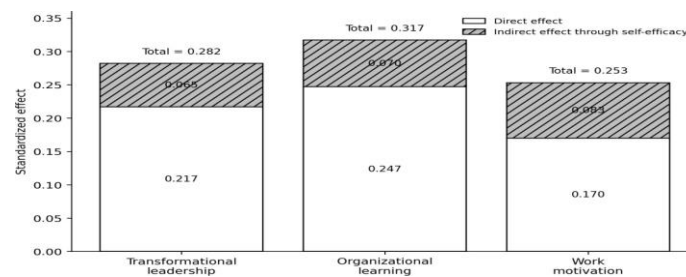
remained positive and significant, the pattern was complementary partial mediation. Organizational learning produced the largest total effect on innovative behavior (.317), whereas work motivation showed the largest mediated proportion (VAF= 32.81%). The corrected total effect for transformational leadership was .282, calculated as .217 +.065.

Table 4. Direct, indirect, total, and mediated effects

Antecedent → IWB	Direct β	Indirect β	Total β	t indirect	p	VAF / mediation
Transformational leadership	.217	.065	.282	3.254	.001	23.05% / partial
Organizational learning	.247	.070	.317	3.204	.001	22.08% / partial
Work motivation	.170	.083	.253	3.931	< .001	32.81% / partial
Work motivation	.170	.083	.253	3.931	< .001	32.81% / partial

Note. Total effect = direct + indirect. VAF = indirect / total. All three indirect effects were positive and statistically significant.

Figure 2. Decomposition of total effects into direct and self-efficacy-mediated components



DISCUSSION

Self-Efficacy as the Main Proximal Driver

Self-efficacy was the strongest direct predictor of innovative work behavior ($\beta = .368$) and had a moderate effect size ($f^2 = .235$). This finding supports social cognitive theory: teachers are more likely to move from an idea to experimentation, advocacy, implementation, and revision when they believe they can manage the demands and uncertainty of innovation (Bandura, 1997). The high descriptive self-efficacy index (76.48%) is consistent with this structural result.

The finding does not imply that innovation is a purely individual trait. Efficacy judgments are shaped by mastery experiences, credible models, verbal persuasion, and interpretations of difficulty. Leadership, collegial learning, and motivation can therefore create or weaken the confidence needed to act. This explains why self-efficacy transmitted part, but not all, of each antecedent's influence.

Organizational Learning Produces the Largest Total Effect

Organizational learning had the largest direct effect on innovative work behavior ($\beta = .247$) and the largest total effect (.317). This result suggests that

collaboration, dialogue, knowledge documentation, empowerment, and strategic learning routines reduce the practical cost of innovation. Teachers gain examples, feedback, partners, and institutional memory, making ideas easier to test and sustain.

Its indirect effect through self-efficacy was also significant ($\beta = .070$; VAF = 22.08%). Professional learning communities therefore work through two channels: they improve the technical and social conditions of implementation, and they provide vicarious experience and feedback that strengthen confidence. This interpretation is consistent with research showing that teacher communities are most productive when collaboration is structured around evidence and classroom practice (Vangrieken et al., 2017; Fix et al., 2021).

Transformational Leadership Creates Legitimacy and Confidence

Transformational leadership directly predicted innovative work behavior ($\beta = .217$) and self-efficacy ($\beta = .176$). Principals contribute by communicating a credible improvement agenda, modeling professional learning, stimulating critical thinking, and providing individualized support. These behaviors signal that responsible experimentation is legitimate rather than risky or peripheral work.

The indirect effect through self-efficacy was .065, representing 23.05% of the total effect. Thus, leadership operates both structurally and psychologically: principals can protect time, resources, and collaboration while also strengthening teachers' beliefs that they can carry out difficult changes. Principal development should therefore be assessed through observable innovation-enabling practices, not motivational rhetoric alone.

Motivation Has the Strongest Relative Mediated Share

Work motivation had the largest effect on self-efficacy ($\beta = .225$) and the highest mediated proportion (VAF = 32.81%). This indicates that motivation is especially likely to become innovation when it produces engagement, practice, and mastery experiences that strengthen confidence. Motivation provides direction and persistence; efficacy provides the judgment that the intended action is feasible.

The direct effect of motivation on innovative behavior remained significant ($\beta = .170$), confirming that persistence, achievement orientation, affiliation, and constructive influence can sustain experimentation even beyond efficacy beliefs. School policies should therefore combine recognition with meaningful goals, teacher voice, realistic innovation targets, and support during implementation rather than relying only on external rewards.

An Integrated School Innovation Architecture

Taken together, the results support an integrated school innovation architecture. Transformational leadership establishes legitimacy and direction; organizational learning provides knowledge, social support, and institutional memory; motivation sustains effort; and self-efficacy converts these resources into action. Because all mediations were partial, no single intervention can replace the others.

A practical sequence is to identify a classroom problem, set a manageable innovation target, provide peer examples and coaching, protect time for a small-scale trial, review evidence, and recognize learning from both success and failure.

This sequence creates mastery experiences while embedding innovation in collective routines. Education authorities can scale the approach by linking principal development, professional learning communities, and teacher coaching to common indicators of innovation.

Theoretical Contribution

The study contributes by comparing managerial, organizational, motivational, and psychological pathways within one model of public elementary-school teachers. It demonstrates that self-efficacy is a transmission mechanism, but the largest total influence originates in organizational learning. Theoretically, the result connects social cognitive theory with learning-organization and transformational-leadership perspectives.

The mediation proportions also refine the explanation. Motivation depends most strongly on efficacy conversion, while organizational learning retains the strongest overall influence because it changes both confidence and the practical conditions of implementation. This distinction is useful for designing interventions: efficacy coaching should accompany, not substitute for, organizational reform.

CONCLUSIONS AND RECOMMENDATIONS

This study demonstrates that innovative work behavior among public elementary-school teachers is jointly shaped by transformational leadership, organizational learning, work motivation, and self-efficacy. The model explained 54.5% of innovative work behavior, and self-efficacy was the strongest proximal predictor. All three antecedents affected innovation directly and indirectly, confirming complementary partial mediation. Organizational learning produced the largest total effect, while motivation had the largest proportion transmitted through self-efficacy.

Schools should institutionalize evidence-focused professional learning, develop principals who protect and legitimize responsible experimentation, create motivation-supportive work conditions, and use coaching to generate progressive mastery experiences. The central managerial implication is coordination: confidence-building interventions will be more effective when teachers also have knowledge, time, collegial support, and organizational permission to innovate.

ADVANCED RESEARCH

Several limitations qualify the conclusions. The cross-sectional design cannot establish temporal causality. Although the sample was proportionally allocated across subdistricts, convenience recruitment within allocations limits probability-based generalization. All variables were measured through a single self-report questionnaire, creating possible common-method and social-desirability bias. The very high reliability coefficients may indicate redundant items. In addition, the archived output did not contain HTMT, inner VIF, blindfolding, or PLSpredict statistics.

Future research should use longitudinal or time-lagged designs, stratified probability sampling, and multi-source measures in which principals, peers, or

classroom evidence complement teacher self-reports. Multilevel analysis is needed to separate teacher-level motivation and efficacy from school-level leadership and learning culture. Scale-shortening studies should retain theoretical coverage while reducing redundancy, and future PLS-SEM reports should include HTMT, collinearity diagnostics, confidence intervals, and out-of-sample prediction.

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DECLARATIONS

Ethics approval: Following institutional review, formal ethics committee approval was not required because this study was a minimal-risk, non-interventional survey involving adult teachers and did not collect clinical or highly sensitive personal information. Institutional research permission was obtained from the relevant education authority and participating public elementary schools.

Informed consent: Before questionnaire completion, all participants received information concerning the study purpose, procedures, voluntary participation, confidentiality, aggregate reporting, and the right to withdraw without penalty. Written or electronically documented informed consent was obtained.

Conflict of interest: The authors declare no financial, professional, institutional, or personal conflict of interest that could have influenced the design, analysis, interpretation, or reporting of the study.

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Data availability: De-identified data and the research instrument may be made available by the corresponding author upon reasonable request, subject to participant confidentiality, institutional regulations, and applicable data-protection requirements. The dataset is not publicly posted because school and respondent combinations may permit indirect identification.

Generative AI disclosure: OpenAI's ChatGPT was used to assist with language editing, grammatical correction, organization, and academic presentation. It was not used to collect or fabricate data, conduct the statistical analysis, generate research findings, or replace the authors' scholarly interpretation. All AI-assisted content was reviewed and revised by the authors, who remain fully responsible for the manuscript.

Related-work disclosure: This article is derived from the first author's doctoral dissertation and presents a mediation-focused analysis of the dissertation dataset. Any submitted, accepted, or published manuscript using the same participants, variables, or structural model must be disclosed

to the editor and cited where appropriate. The manuscript should not be submitted simultaneously to another journal.

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