School Leadership Support and Teacher Innovative Work Behaviour in Public Schools of Quetta: The Mediating Role of Psychological Empowerment (A PLS-SEM Study of Public-Sector Teachers in Balochistan, Pakistan)

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ABSTRACT: The current study assessed the link between school leadership support and innovative work behaviour among teachers in public schools in Quetta, Balochistan, and determined whether psychological empowerment mediates this relationship. Based on the social cognitive theory and Spreitzer's cognitive framework of workplace empowerment, an exploratory survey was conducted among 200 teachers randomly selected from public schools in Quetta district. School leadership support was assessed with DiPaola's Principal Support Scale; teachers' innovative work behaviour was captured with Janssen's Innovative Work Behaviour Scale; and psychological empowerment was assessed through Spreitzer's four-dimensional Psychological Empowerment Scale. The results from the PLS-SEM analysis in SmartPLS indicated a satisfactory measurement model, with acceptable internal consistency and construct validity. Indicator loadings exceeded .70; composite reliability ranged from .914 to .936 and AVE from .541 to .591, while both the Fornell-Larcker assessment and HTMT results confirmed discriminant validity. The structural results accounted for 20.8% of psychological empowerment and 32.2% of innovative work behaviour. School leadership support significantly predicted psychological empowerment ($\beta = .456$, $p < .001$) and, in turn, directly predicted innovative work behaviour ($\beta = .177$, $p < .01$), while psychological empowerment also significantly predicted innovative work behaviour ($\beta = .465$, $p < .001$). Bootstrapping with 5,000 resamples produced a significant indirect effect ($\beta = .212$, 95% CI [.144, .300]), indicating partial mediation by psychological empowerment (VAF = 54.5%).

KEYWORDS: School Leadership Support, Psychological Empowerment, Teacher Innovative Work Behaviour, PLS-SEM, Public Schools, Quetta, Balochistan

Pages: 108 – 120
Volume: 5
Issue: 7 (July 2026)

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Cite this Article: Arbab, F., Rahim, A., Dar, M. U., Ambreen, S., & Bashir, M. (2026). School Leadership Support and Teacher Innovative Work Behaviour in Public Schools of Quetta: The Mediating Role of Psychological Empowerment (A PLS-SEM Study of Public-Sector Teachers in Balochistan, Pakistan). *The Regional Tribune, 5*(7), 108-120. https://doi.org/10.55737/trt/v-vii.355

Introduction

South Asian public education systems face ever-growing pressures to modernize their teaching processes, given limited budgets, large class sizes, and limited administrative capacity (Wahid & Ayub, 2024). In such conditions, teachers' capacity to generate and implement new ideas becomes increasingly important. Innovative behaviour in teaching does not occur automatically and is influenced by how teachers feel supported, encouraged, and empowered at their workplaces (Bao, 2024). Janssen's (2000) framework describes innovative work behaviour as progressing through three phases: idea generation, idea promotion, and idea realisation. All three phases require discretionary effort from teachers, who are more likely to invest it if the school head listens to their opinions, respects their judgement, and takes all possible steps to remove any barriers to their professional development (Đuranović et al., 2024).

School leadership support is operationalised using the Principal Support Scale developed by DiPaola (2012). The concept of school leadership support comprises two dimensions: expressive (listening, trust, encouragement, recognition) and instrumental (professional development, feedback, and resources). There is an increasing amount of international literature evidencing the positive relationship between supportive and inclusive school leadership and innovative behaviour of teachers (Ahmed et al., 2023; Bao, 2024). Nevertheless, the way this relationship unfolds remains unclear and warrants further study, especially in the context of a low-supported public education system such as that of Balochistan – the largest and least resourceful province of Pakistan.

Psychological empowerment may explain how supportive conditions translate into teachers' innovative work behaviour. Spreitzer (1995) conceptualizes psychological empowerment as a motivational state represented by four cognitions: meaning, competence, self-determination, and impact. When teachers see their work as meaningful, feel capable of doing it, are free to make discretionary decisions, and believe that the changes they introduce affect the results, their minds are prepared for the challenges of innovation (Rahimi et al., 2024; Siddiqui et al., 2023). Evidence from China (Bao, 2024; Qu et al., 2024) and South Asian settings (Sageer & Qureshi, 2023) suggests that psychological empowerment can transmit the effect of supportive school leadership to teachers' innovative behaviour. Comparable evidence from Pakistani school settings, however, remains limited.

Quetta district presents an appropriate case to investigate the issues raised. Public-school teachers in Balochistan have to work under a hierarchical system, with limited resources and various geographical constraints. Understanding how school heads' discretionary support affects teachers' innovative work behaviour helps develop better policies for principals' training in the province. Three hypotheses are stated:

H1: Higher school leadership support is associated with greater psychological empowerment among teachers.
H2: Higher school leadership support is associated with stronger teacher innovative work behaviour.
H3: Greater psychological empowerment is associated with stronger teacher innovative work behaviour.
H4: Psychological empowerment carries the effect of school leadership support to teachers' innovative work behaviour.

Literature Review and Development of Hypotheses

Link Between School Leadership Support and Psychological Empowerment

According to social cognitive theory, people's beliefs in their ability and agency are strongly influenced by various factors in their environment, including the encouragement and feedback provided by authority figures (Bao, 2024). In the context of schools, the principal represents the closest and most authoritative person, and their supportive or non-supportive behaviour serves as an interpersonal resource for interpreting the meaning of work and its

controllability for teachers (DiPaola, 2012; Đuranović et al., 2024). There is sufficient evidence outside Pakistan that shows a positive relationship between school leaders' support and teachers' psychological empowerment. For example, Bao (2024) found that principals' inclusive leadership positively correlates with psychological empowerment among Chinese teachers, while Qu et al. (2024) showed that perceptions of institutional legitimacy are positively associated with psychological empowerment. A similar relationship has been observed among other leaders and employees' psychological states in various Pakistani organizations (Wahid & Ayub, 2024). Accordingly, school leaders' support is expected to strengthen Quetta teachers' perceptions of meaning, competence, self-determination, and impact.

School Leadership Support and Teacher Innovative Work Behaviour

Apart from the indirect influence through empowerment, leadership support could encourage teachers' innovative behaviour in an obvious way. Ahmed et al. (2023) reported a positive association between principals' inclusive leadership and teachers' innovative work behaviour, while Bao (2024) found a direct positive link between school leaders' inclusion and innovative behaviour even after accounting for mediating effects. Frontiers research on the role of transformational principal leadership found that school leaders' efforts to support their staff were positively associated with teachers' innovative work behaviour due to the creation of meaning (DiPaola, 2012). Instrumental support, in particular, gives teachers the chance to generate and realise ideas through the resources provided to them (time for planning, professional development, and constructive feedback). Hence, leadership support is expected to have a positive relationship with innovative work behaviour, independent of its influence on psychological empowerment.

Psychological Empowerment as an Antecedent of Teacher Innovative Work Behaviour

Spreitzer's (1995) four empowerment cognitions imply an active orientation toward work, which should facilitate innovative behaviour. Teachers who find meaning in their work invest additional effort in generating ideas; those who feel competent are more likely to come up with new solutions; those who have self-determination have freedom to use different methods without asking for permission, and those who believe in the impact of their work believe that their innovations will have effects. Siddiqui et al. (2023) showed that psychological empowerment predicts innovative work behaviour through knowledge sharing; Rahimi et al. (2024) reported that it mediates the link between quality of work life and innovative teaching behaviour; and Qu et al. (2024) identified a serial mediating role for psychological empowerment in the effect of institutional legitimacy on teachers' innovative behaviour. Likewise, Bao (2024) reported that psychological empowerment was a stronger mediator of the inclusive-leadership–innovative-behaviour relationship than the alternative mediators examined. On this basis, greater psychological empowerment is expected to predict stronger innovative work behaviour among public-school teachers in Quetta.

Psychological Empowerment as a Mediating Mechanism

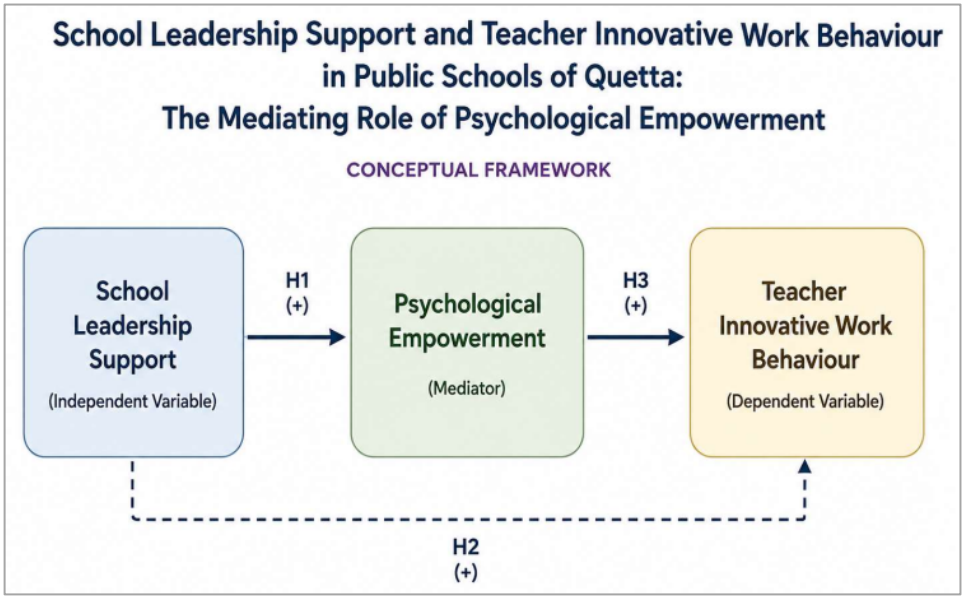
Taken together, the literature supports a sequence in which leadership support functions as a distal organizational resource, psychological empowerment operates as a proximal motivational state, and innovative work behaviour emerges as the outcome. Evidence for this mediating process has been reported in Chinese basic education (Bao, 2024; Qu et al., 2024), Iranian elementary education (Rahimi et al., 2024), and mixed organizational samples in Pakistan (Siddiqui et al., 2023; Wahid & Ayub, 2024). Overall, the evidence suggests that psychological empowerment does more than correlate with teacher innovation; it may be the mechanism through which supportive leadership influences it. Whether the mechanism works in the under-resourced, hierarchically administered public school system in Quetta remains an empirical question addressed in this study.

Conceptual Framework

Figure 1 illustrates the proposed model. In the proposed model, school leadership support serves as the predictor, psychological empowerment functions as the mediator, and teacher innovative work behaviour is the outcome variable. H1 and H3 define the indirect path, while H2 defines the direct path for testing partial or full mediation.

Figure 1

Conceptual Framework of the Hypothesised Relationships



Note: SLS = school leadership support; PE = psychological empowerment; IWB = teacher innovative work behaviour. H1 and H3 jointly represent the indirect (mediated) path; H2 represents the direct path.

Method

Research Design and Study Setting

A quantitative cross-sectional correlational design was used to test the proposed mediation model. Data were collected from teachers at public schools across school levels (primary, middle, high, and higher secondary) in Quetta district, Balochistan. A cross-sectional design was deemed appropriate for this explanatory research, without the need for causal inference, given practical limitations in gaining access to public-school teachers in a geographically dispersed district within a single data collection period.

Population and Sample

The accessible population comprised teachers employed at public schools run by the concerned district-level education authorities in Quetta. Of the 200 usable responses used for analysis, data were screened to meet the minimum sample size requirements of PLS-SEM, specifically five to ten observations per indicator for the most complex construct, which also exceeds the 10-times rule for such a small model (Hair et al., 2022). Respondents were sampled from multiple schools by school codes and levels to increase representativeness within the accessible population. Table 1 presents the demographic profile of the 200 respondents.

Table 1

Respondent Demographic Profile (N = 200)

Characteristic	Category	n	%
Gender	Male	118	59.0
	Female	80	40.0
	Prefer not to say	2	1.0
Age group	20–29 years	29	14.5
	30–39 years	76	38.0
	40–49 years	60	30.0
	50 years or above	35	17.5
Highest qualification	Bachelor	49	37.5
	Master	146	86
	Other	5	2.5
Teaching experience	Less than 5 years	42	21.0
	5–10 years	52	26.0
	11–15 years	39	19.5
	16–20 years	33	16.5
	More than 20 years	34	17.0
School level	Primary	50	25.0
	Middle	38	19.0
	High	64	32.0
	Higher secondary	48	24.0
Years in current school	Less than 2 years	32	16.0
	2–5 years	82	41.0
	6–10 years	54	27.0
	More than 10 years	32	16.0

Note: Percentages are rounded to one decimal point.

Instruments

School leadership support was assessed with DiPaola's (2012) Principal Support Scale, adapted for public-school teachers by replacing the terms "principal/school leader" with "school head." Responses were recorded on a six-point agreement continuum ranging from 1 (strongly disagree) to 6 (strongly agree), covering expressive support (trust, active listening, and recognition) and instrumental support (feedback, resource allocation, and professional development opportunities). The scale proved good internal consistency with large groups of teachers (Đuranović et al., 2024; Hinson, 2018).

Teacher innovative work behaviour was assessed using Janssen's (2000) nine-item Innovative Work Behaviour Scale, adapted to the teaching context. Its items represent idea generation, idea promotion, and idea realization and use a seven-point frequency response format from 1 (never) to 7 (always). Such an instrument has been applied previously for teachers (Hosseini & Haghighi Shirazi, 2021) and adapted for academic staff at universities in Pakistan (Shahab & Imran, 2018).

Psychological empowerment was assessed with Spreitzer's (1995) 12-item Psychological Empowerment Scale. The instrument comprises four three-item dimensions—meaning, competence, self-determination, and impact—and responses were given on a seven-point agreement scale from 1 (very strongly disagree) to 7 (very strongly agree). The scale was shown to be valid for use with school teachers in Pakistan (Sageer & Qureshi, 2023) and with other samples of secondary-school staff in South Asia (Bhattacharya & Narad, 2024). All three instruments were

contextually adapted rather than presented in their verbatim translations, and standard procedures for instrument adaptation (expert review and pilot testing) were applied before large-scale data collection.

Data Collection Procedure

Teachers completed the self-report questionnaire anonymously, with the assurance that their identities would not be revealed, and were required to provide only data from the demographic categories listed in Table 1. Standard measures for controlling common method bias were taken during the design phase of research, including psychological isolation of predictor and criterion items in the instrument, simple and clear formulation of items, and the assurance of respondents' anonymity, which is in line with the best practices for survey research among teachers (Hair & Alamer, 2022).

Analytical Strategy

The data were analysed using PLS-SEM in SmartPLS. Following the two-stage procedure for reflective models (Hair et al., 2022), the measurement model was evaluated for indicator reliability, internal consistency (Cronbach's alpha and composite reliability), convergent validity (AVE), and discriminant validity using the Fornell-Larcker criterion and HTMT (Fornell & Larcker, 1981; Henseler et al., 2015). Subsequently, the structural model was assessed for collinearity (VIF), path significance, R^2, and f^2. Because PLS-SEM does not depend on multivariate normality, the significance of the paths and indirect effects was tested using nonparametric bootstrapping with 5,000 resamples, consistent with recent recommendations for education research (Demir & Uşak, 2025; Hair & Alamer, 2022).

Results

Descriptive Results

Table 2 reports the means, standard deviations, and skewness/kurtosis statistics for the three study composites. In general, teachers reported moderately strong support from school leaders (M = 4.06, SD = 0.97, 6-point scale) and quite high levels of innovative work behaviour (M = 4.46, SD = 1.24) and psychological empowerment (M = 4.65, SD = 1.19), both 7-point scales. For every construct, skewness and kurtosis fell within ±1, indicating no substantial departure from normality for descriptive purposes.

Table 2

Summary Statistics for Study Variables (N = 200)

Variable	Scale Range	M	SD	Skewness	Kurtosis
School leadership support (SLS)	1–6	4.06	0.97	-0.25	-0.29
Teacher innovative work behaviour (IWB)	1–7	4.46	1.24	-0.25	-0.82
Psychological empowerment (PE)	1–7	4.65	1.19	-0.28	-0.52

Assessment of Measurement Model

Iterative assessment of item loadings indicated that seven items of school-leadership-support measure (SLS3, SLS7, SLS10–SLS14), one item of teacher innovative work behaviour measure (IWB7), and one item of psychological-empowerment measure (PE10) had to be discarded either because of having lower than the recommended .70 level of standardized loading or because their discarding improved average variance extracted without loss of content validity (Hair et al., 2022). After item removal, the measurement model retained 9 SLS indicators, 8 IWB indicators, and 11 PE indicators. As shown in Table 3, all retained loadings are in the range .705–.831, surpassing the

recommended .70 threshold. Cronbach's alpha is in the range .894–.925, composite reliability is in the range .914–.936, and average variance extracted is in the range .541–.591, all exceeding the respective minimum thresholds of .70 and .50 (Hair et al., 2022). Collectively, these values support adequate internal consistency and convergent validity across all three constructs.

Table 3

Measurement Model: Loading of Indicators and Construct Reliability/Validity

Construct / item	Outer loading	α	CR	AVE
School Leadership Support (SLS)		.894	.914	.541
SLS1	.767			
SLS2	.719			
SLS4	.763			
SLS5	.714			
SLS6	.712			
SLS8	.750			
SLS9	.733			
SLS15	.723			
SLS16	.736			
Teacher Innovative Work Behaviour (IWB)		.900	.920	.591
IWB1	.781			
IWB2	.726			
IWB3	.791			
IWB4	.717			
IWB5	.734			
IWB6	.831			
IWB8	.782			
IWB9	.779			
Psychological Empowerment (PE)		.925	.936	.571
PE1	.806			
PE2	.746			
PE3	.796			
PE4	.762			
PE5	.746			
PE6	.773			
PE7	.720			
PE8	.768			
PE9	.711			
PE11	.772			
PE12	.705			

Note: α denotes Cronbach's alpha, CR composite reliability, and AVE average variance extracted. Reliability and validity coefficients are shown on construct rows, whereas indented item rows display standardized outer loadings from the PLS algorithm.

Discriminant validity was evaluated with both the Fornell-Larcker criterion and HTMT. In Table 4, each construct's square root of AVE on the diagonal is larger than its correlations with the other constructs, meeting the Fornell-Larcker requirement (Fornell & Larcker, 1981). HTMT values range from .423 to .590, remaining below the conservative .85 cut-off (Henseler et al., 2015), which supports discriminant validity for the three constructs.

Table 4

Discriminant Validity Results: Fornell-Larcker and HTMT

Construct	1. SLS	2. IWB	3. PE
1. School Leadership Support	.735		
2. Teacher Innovative Work Behaviour	.362	.768	
3. Psychological Empowerment	.460	.537	.756

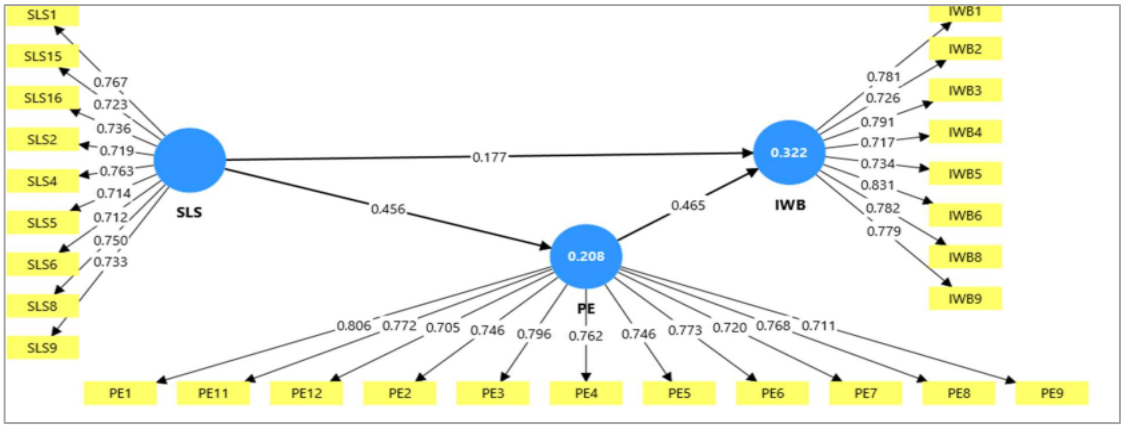
Note. Bold diagonal entries are the square roots of AVE; values below the diagonal are correlations among constructs. The HTMT values, not displayed in the matrix, are .423 for SLS–IWB, .497 for SLS–PE, and .590 for IWB–PE; each is below .85.

Structural Model Assessment

Collinearity among independent variables was evaluated before path estimation; the variance inflation factor for the two predictors of innovative work behaviour was 1.27, well below the conservative threshold of 3.3, indicating no collinearity biasing structural estimates (Hair et al., 2022). Figure 2 presents the PLS structural model, including standardized outer loadings, path coefficients, and R^2 values.

Figure 2

PLS-SEM Structural Model Results



Note: SLS = school leadership support; PE = psychological empowerment; IWB = teacher innovative work behaviour. Values on arrows are standardized path coefficients; values inside the endogenous-construct circles are R^2 values.

The model explains 20.8% of variance in psychological empowerment (R^2 = .208) and 32.2% of variance in teacher innovative work behaviour (R^2 = .322). Using Cohen's criteria adapted for PLS-SEM, SLS had a large effect on PE (f^2 = .268), PE had a large effect on IWB (f^2 = .250), whereas the direct SLS→IWB effect was small (f^2 = .024); this pattern indicates that much of leadership support's influence on innovation operates through psychological empowerment.

Path significance was determined through 5,000-sample bootstrapping. Table 5 shows that all three structural paths are positive and statistically significant. School leadership support positively predicts psychological empowerment (β = .456, t = 6.91, $p < .001$), thus supporting H1. School leadership support also predicts innovative

work behaviour directly (β = .177, t = 2.72, p = .007), thus supporting H2. Psychological empowerment positively predicts innovative work behaviour (β = .465, t = 8.02, p < .001), thus supporting H3.

Table 5

Path Estimates and Hypothesis Decisions

Path	β	t	p	95% CI	Decision
H1: SLS → PE	.456	6.91	< .001	[.333, .591]	Supported
H2: SLS → IWB (direct)	.177	2.72	.007	[.013, .270]	Supported
H3: PE → IWB	.465	8.02	< .001	[.356, .582]	Supported

Note: SLS = school leadership support; PE = psychological empowerment; IWB = teacher innovative work behaviour. Confidence intervals and p-values were obtained from bias-corrected bootstrapping with 5,000 resamples.

Mediation Analysis

H4 proposed that psychological empowerment transmits the effect of school leadership support to teacher innovative work behaviour. The bootstrapped indirect path from school leadership support to innovative work behaviour via psychological empowerment was significant (β = .212, t = 5.30, p < .001, 95% CI [.144, .300]); because the interval excluded zero, mediation was supported. Because the direct path (H2, β = .177) also remained significant, the mediation pattern is complementary partial mediation (Table 6). The overall SLS→IWB effect was .389, of which 54.5% was attributable to the indirect route (VAF). H4 is supported.

Table 6

Mediation Analysis: Indirect, Direct, and Total Effects

Effect	β	t	p	95% CI	VAF
Indirect: SLS → PE → IWB	.212	5.30	< .001	[.144, .300]	54.5%
Direct: SLS → IWB	.177	2.72	.007	[.013, .270]	—
Total effect: SLS → IWB	.389	—	—	—	—

Note: VAF expresses the indirect effect as a proportion of the total effect. Values from 20% to 80% are commonly interpreted as partial mediation (Hair et al., 2022); here, VAF = 54.5%, and the significance of both paths indicates complementary partial mediation.

Discussion

This study examined whether psychological empowerment explains part of the association between school leadership support and teachers' innovative work behaviour among public school teachers in Quetta. All four hypotheses were supported. As expected in accordance with social cognitive theory and consistent with the recent results obtained in China (Bao, 2024; Qu et al., 2024) and Pakistan (Wahid & Ayub, 2024), school leadership support turned out to be a strong and positive predictor of teachers' psychological empowerment, thus implying that when school leaders in Quetta provide expressive support (trust, recognition, active listening) and instrumental support (feedback, time, professional development) to their teachers, the latter are more likely to perceive their job as meaningful and to feel competent, autonomous, and influential.

School leadership support was also found to be directly related to innovative work behaviour, replicating results from the contexts of inclusive leadership in Pakistan (Ahmed et al., 2023) and in China (Bao, 2024). However, the effect size of this direct path appears small relative to the large effect sizes for the paths associated with psychological empowerment, and the mediation analysis demonstrates that just over half of leadership support's effect on

innovation works indirectly through empowerment. It implies that leadership support itself is necessary but not sufficient for fostering innovative work behaviour; teachers' psychological state greatly augments its effect on innovation. This finding is similar to the recent results obtained by Rahimi et al. (2024) regarding the mediating role of psychological empowerment in linking work-life quality to innovative teaching behaviour, and to those obtained by Siddiqui et al. (2023) in the context of innovation at work.

The strongest structural coefficient in the model linked psychological empowerment with innovative work behaviour (β = .465), underscoring the importance of teachers' motivational-cognitive state for innovation in this setting. Teachers who find their work meaningful, feel competent, capable of exercising professional judgment, and influential in school decision-making are more likely to generate, promote, and implement new ideas in their instruction – even in a constrained resource system. This finding is consistent with Spreitzer's (1995) theoretical prediction and subsequent applications in South Asian teaching contexts (Bhattacharya & Narad, 2024; Sageer & Qureshi, 2023).

Overall, these results suggest that in Balochistan's public schools, any leadership development efforts should focus on the distinction between teacher support and teacher empowerment. Interventions focused solely on increasing the frequency of supportive gestures (e.g., praising, providing feedback) are likely to produce only a modest effect on innovation unless accompanied by efforts to empower teachers, namely by delegating meaningful decision-making power over classroom activities.

Theoretical and Applied Implications

Theoretically, the findings extend the empowerment-mediated leadership-innovation model by providing evidence from another national and cultural setting, complementing studies conducted primarily in China and broader international samples (Bao, 2024; Qu et al., 2024; Rahimi et al., 2024).

Practically, the findings identify several actionable priorities for education authorities in Balochistan. First, any principal training programs should target the four empowerment cognitions, thereby helping school leaders help their teachers perceive their work as meaningful, build their confidence through feedback, grant them instructional autonomy, and open channels through which teacher-generated ideas can influence school decisions. Second, since instrumental support showed very high loadings alongside expressive support, resource-constrained schools might benefit more from focusing on a few high-impact instrumental supports (such as protected planning time and targeted access to professional development) rather than spreading scarce resources thin across multiple low-impact programs. Third, since the direct effect of leadership support on innovation appeared small on its own, any policy aiming to foster innovation in combination with leadership support initiatives should also provide structures for teacher empowerment (e.g., school-based decision-making committees, a peer-recognition program for innovative practice).

Study Limitations and Future Research Directions

Several limitations should be considered. First, because the data are cross-sectional, strong causal conclusions cannot be drawn; longitudinal or time-lagged designs would provide firmer evidence about directionality. Second, all variables were collected via single-source teacher self-reports, which might introduce common-method variance despite the precautions taken in designing the instruments. Third, the current sample was drawn only from public schools in one specific district (Quetta), which might limit generalizability to other districts in Balochistan or to the private-school context; replication with larger, multistage, or province-representative samples is recommended.

Fourth, the present study models psychological empowerment as a higher-order composite, and in the future it is possible to investigate whether different empowerment dimensions (meaning, competence, self-determination, impact) mediate the leadership-innovation relationship differently. Fifth, further studies could incorporate additional potential mediators (e.g., teacher self-efficacy, school innovation climate) and moderators (e.g., years of principal experience) to develop a comprehensive understanding of how leadership in schools translates into classroom innovation in under-resourced public education systems.

Conclusion

The findings show that, among public-school teachers in Quetta, school leadership support is positively related to both psychological empowerment and innovative work behaviour, with psychological empowerment accounting for part of the link between leadership support and innovation. Overall, supportive school leadership appears to foster teacher innovation both directly and, more importantly, by strengthening teachers' psychological empowerment. For an under-resourced public education system, developing leaders' skills to empower, rather than merely support, their teachers appears to be a relatively inexpensive way to encourage the instructional innovation needed to improve educational outcomes in Balochistan.

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