

Exploring the Readiness and Anticipated Impact of Teacher Licensing Systems on Teacher Performance in Pakistan: Evidence from Structural Equation Modelling

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ABSTRACT

Teacher licensing has emerged as a widely discussed reform mechanism for strengthening educational quality and professional accountability, yet whether such systems actually change what happens in classrooms depends heavily on institutional readiness, managerial support, and the way teachers themselves perceive the reform. Building directly on the instrument that we designed and validated in our companion methodological paper (Kamal & Saadi, 2025), this study examined the structural relationships among the Teacher Licensing System (TLS), the Role of Management, Potential Challenges, Suggestions for Implementation, and Teacher Performance among secondary-level teachers in Punjab, Pakistan. A structured questionnaire, grounded in that validated instrument, was administered to a stratified random sample of secondary school teachers ($N = 770$) across rural and urban tehsils of Punjab. Data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) in SmartPLS 4, following a two-stage measurement-then-structural model evaluation. All constructs demonstrated strong reliability and convergent validity (Cronbach's alpha and composite reliability > 0.85 ; AVE = 0.51-0.79), and discriminant validity was confirmed via the Fornell-Larcker criterion. The structural model showed that the Teacher Licensing System ($\beta = 0.494$, $p < .001$) and the Role of Management ($\beta = 0.346$, $p < .001$) were the strongest positive predictors of teachers' Key Performance Indicators, while additional non-teaching responsibilities eroded the benefit of licensing ($\beta = -0.374$, $p < .001$). Potential Challenges showed a small but significant positive association with performance, a pattern more consistent with a challenge-stressor interpretation than with a simple hindrance effect. The model explained 64.2% of the variance in teacher performance ($R^2 = 0.642$), with satisfactory predictive relevance ($Q^2 > 0$). We conclude that the success of teacher licensing in Pakistan is unlikely to rest on the policy document alone; it depends on how actively management translates the policy into everyday practice, and on how much of teachers' time is protected from non-instructional duties.

Keywords: Teacher Licensing System (TLS); Teacher Performance; Educational Management; Structural Equation Modelling (SEM); PLS-SEM; Professional Development; Pakistan; Policy Reform; Teacher Accountability

INTRODUCTION

Globally, majority of Governments have developed licensing as a means of providing a seemingly straightforward solution to answering the question: How do we know the teacher will be ready, and remain ready, to teach? Teachers' professional competence demonstrated and periodically renewed systems have been said to have improved instructional quality and boosted confidence in the profession by the public (Darling-Hammond, 2017). This is the trend that Pakistan's education system has been following and

Punjab's is no exception as the Education Authority is testing and talking about implementing Teacher Licensing System (TLS) that will standardize expectations around subject knowledge, pedagogy, classroom management and professional ethics. But it is an empirical issue how a licensing policy will affect teaching, not a foregone conclusion. The ideas contained in the reform documents are not the ones that fail; it is more the capacity of the management system, its resources, and teachers' daily routines that cause the majority of reform documents to fail to achieve the desired results (Fullan, 2016). This is the focus that this research study aims to investigate. Instead, we are not only interested in documenting the teachers' view on licensing in principle, but also in documenting the teachers' view on how the licensing system influences the teachers' Key Performance Indicators (KPIs), which are shaped by the Role of Management, the Potential Challenges institutions encounter and the teachers' Suggestions for Implementation. This paper is essential to be read as a second part of a two-part research programme. In the first paper, a multidimensional instrument that captures teacher perceptions of a performance-based licensing framework was developed and psychometrically validated, using exploratory analysis and content validation by experts (Kamal & Saadi, 2025). The current study is a field experiment that takes that validated instrument to a larger number of secondary-level teachers in Punjab and applies the instrument to collect data that is then subjected to confirmatory measurement testing and Structural Equation Modelling (SEM). That is, while the first paper asks whether or not this is the appropriate research tool to measure teachers' perceptions, this paper asks what this tool tells us once used widely, and what implications does that have for policy? The constructs we model are motivated by two additional studies in a Pakistani context. Our concern with management capacity is echoed by Ahmed, Choudhry, Rasool, & Hamid (2025), who have shown that the accreditation process affects institutional performance and pre-service teacher achievement which, in turn, relates to how institutions absorb external quality requirements. Mohammad (2025) investigated teachers' perceptions of 2023 Sindh licensing policy, and found some common issues such as unclear implementation processes and workload, constructs that are parallel to the Potential Challenges construct discussed here. Taken together, these studies indicate that the technical implementation of the licensing regime in Pakistan seems to be a much less uncertain stage of licensing policy than the organisational conditions necessary to implement it.

Objectives

1. To examine the impact of the Teacher Licensing System (TLS) on teachers' Key Performance Indicators (KPIs) in secondary schools.
2. To analyse the role of educational management (EDOs, DEOs, and head teachers) in the successful implementation of the teacher licensing system.
3. To identify potential challenges faced by institutions in implementing the Teacher Licensing System.
4. To explore teachers' suggestions for effective and sustainable implementation of the Teacher Licensing System.
5. To develop and validate a structural model that explains the relationships among the Teacher Licensing System, Management Role, Challenges, Implementation Strategies, and Teacher Performance.

Research Questions

1. How does the Teacher Licensing System influence teachers' performance and professional growth in secondary schools?

2. What is the role of management (EDOs, DEOs, and head teachers) in supporting and monitoring the implementation of the Teacher Licensing System?
3. What potential challenges are encountered in introducing and maintaining the Teacher Licensing System in educational institutions?
4. What strategies and suggestions can enhance the successful implementation of the Teacher Licensing System?
5. To what extent does the proposed structural model explain the relationships between the Teacher Licensing System, management role, challenges, implementation strategies, and teacher performance?

LITERATURE REVIEW

Teacher Training and Development for Quality Education

Although teacher development is a complex field, systematic comparisons of educational systems around the world have consistently identified structured licensing, induction, and ongoing certification as key characteristics of the best-performing education systems globally (Darling-Hammond, 2017). Similarly, the OECD's Teaching and Learning International Survey found that when professional standards and assessment systems are accompanied by appropriate feedback and support, teachers feel they are growing professionally and are self-assured in their teaching; when they are not, they feel that the evaluation is a burdensome compliance process (OECD, 2019). This dual nature of licensing as a quality tool and as a possible burden on administration is also seen in the Pakistani literature. Ahmed, Choudhry, Rasool, & Hamid (2025) demonstrated that accreditation and quality-assurance mechanisms have proven to be linked to school performance and the quality of pre-service in teacher education schools where there was administrative capacity to meet accreditation demands. Mohammad (2025) argued that, in general, teachers praised the 2023 licensing policy of Sindh in theory, but showed resistance in practice owing to some ambiguity in policy implementation and the lack of effective communication. This very same dichotomy between theory and practice we have introduced in our conceptual model in the construct of Potential Challenges.

Why is it that some teachers are more efficient than others at implementing changes?

In the education policy literature, there is a common theme that the content of policy is less important than management behaviour in how it is adopted. There is a strong consistent connection between transformational and instructional leadership approaches that offer clear direction, demonstrate desired behaviours and develop staff capacity and ability and smooth implementation of reform (Bass, 1999; Fullan, 2016). Additionally, leadership can have a profound impact on the outcomes of reform, which are highly context specific, as can the effectiveness of the same licensing policy, depending largely on the administrative capacity of the district (Hallinger 2018; Bush 2007).

Well-being and performance are closely interrelated and are influenced by workload. In many LMIS, including Pakistan, teachers are assigned to non-school government jobs like census, polio eradication and electoral duty regularly. Further demands of this type placed in competition with central teaching work have been found to be linked to increased occupational burnout and decreased professional competence (Skaalvik & Skaalvik, 2010) and have long been recognized as a source of occupational strain in teaching in particular (Kyriacou, 2001). Yet the larger body of literature on organisations' behavior warns against equating all "demands" as being harmful. LePine, Podsakoff, & LePine (2005) conceptualize stressors as

when they are challenging but also facilitate growth they can correlate positively to performance, while hindrance stressors are pressuring demands that have no growth benefit. In fact, this difference is directly relevant later in this paper, as some of our findings contradict a straightforward “challenges always hurt performance” story.

Overall, literature can only be summarized into three components that a realistic model of teacher licensing in Pakistan should incorporate: (a) the direct positive effect of the licensing system, (b) the role of management capacity as a mediator and moderator, and (c) the negative effect of non-instructional workload. In the Pakistani literature, what is comparatively rare is a single model which simultaneously estimates all of these relationships with the statistical machinery to distinguish the direct from indirect effects. The gap that the present study aims to address is based on an instrument that has been validated by Kamal and Saadi (2025).

THEORETICAL FOUNDATION AND CONCEPTUAL FRAMEWORK

Theoretical Foundation

The conceptual model is based on three complementary theoretical traditions.

Human Capital Theory (Becker, 1993) understands licensing as an investment; that is, periodic assessment and certification are expected to increase the supply of professional skills and, via this skill, the institutional result.

Transformational Leadership Theory (Bass, 1999) provides the tool for how it is hoped that management will translate the licensing policy into action; by setting the vision, providing individualized support and modelling the standards referred to by the policy.

Both of these perspectives suggest that the benefits of the Teacher Licensing System are not inherent, but rather emerge through investment (Human Capital Theory) and through leadership behavior (Transformational Leadership Theory) across institutions.

Framework Description

The Teacher Licensing System (TLS) is the central exogenous factor in the model, with four pathways extending outwards: directly to Teacher Performance (KPI); to the exogenous factor of the Role of Management, which is the responsibility for embedding policy as part of the broader work; to the exogenous factor of Potential Challenges, which is the tension any policy creates; and to the exogenous factor of Performance Affected by Additional Responsibilities, which is the competing demands on teachers' time. The Role of Management, in turn, is represented to influence Teacher Performance, Potential Challenges, and Suggestions for Implementation, as it was theorized to be the operational arm of the reform. Potential Challenges is an optional category that encompasses both the concept of a challenge that can arise during implementation, and that it can also serve as a source of practical, teacher-generated suggestions for implementation rather than solely as a hindrance to success. Finally, suggestions for Implementation are modelled as a feedback loop into Teacher Performance, signalling the hope for a process of ongoing improvement in the design of the reform through teacher voice.

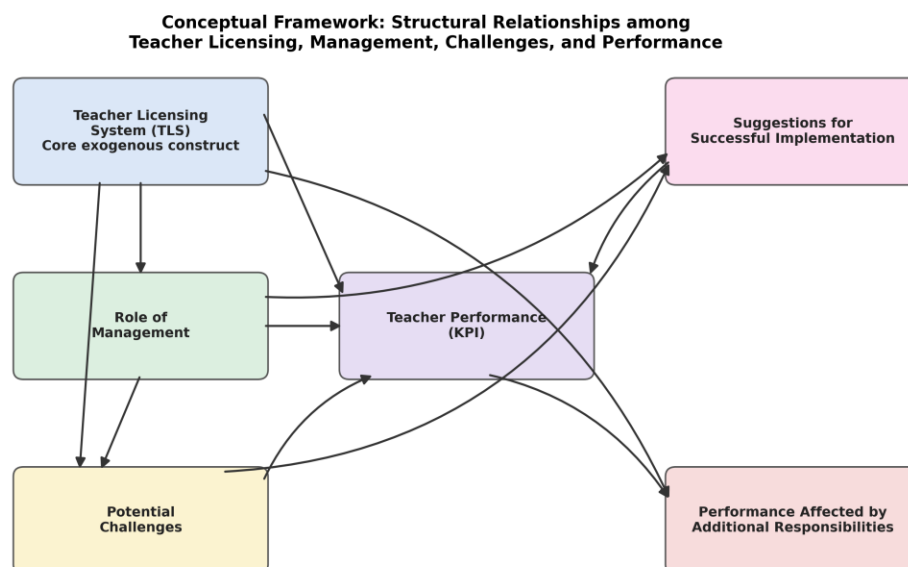


Figure 1. Conceptual framework of the hypothesised structural relationships among the Teacher Licensing System, Role of Management, Potential Challenges, Suggestions for Implementation, and Teacher Performance.

HYPOTHESES DEVELOPMENT

Teacher Licensing System and Teacher Performance

Licensing functions as a professional regulatory mechanism that holds educators to standardised criteria of knowledge, pedagogy, and ethical conduct. Darling-Hammond (2017) and OECD (2019) both link licensing-type mechanisms to improved accountability and professional growth when properly implemented.

H1: The Teacher Licensing System (TLS) has a positive and significant effect on teachers' Key Performance Indicators (KPI).

Teacher Licensing System and Performance Affected by Additional Responsibilities

Teachers frequently absorb administrative, political, or community duties that compete with instructional time. Skaalvik and Skaalvik (2010) and Kyriacou (2001) both document that such non-teaching demands erode teacher motivation and performance when they accumulate.

H2: The Teacher Licensing System negatively affects teachers' performance when that performance is influenced by additional responsibilities.

Role of Management and Teacher Performance

Leadership support has repeatedly been linked to teacher morale, accountability, and access to professional development (Fullan, 2016).

H3: The Role of Management has a positive and significant impact on teachers' Key Performance Indicators (KPI).

Role of Management and Potential Challenges

Theoretically, new policy can be obstructed by institutional resistance and will be smoother to implement when management is capable and resourceful (Bush, 2007; Hallinger, 2018).

H4: The Role of Management has a negative relationship with Potential Challenges in implementing the Teacher Licensing System.

Role of Management and Suggestions for Implementation

Leaders who are open and willing to include input from others are more likely to encourage teachers to provide comments if they are positive (Leithwood, Harris, & Hopkins, 2020).

H5: The Role of Management has a positive effect on Suggestions for Successful Implementation of Teacher Licensing System.

Potential Challenges and Teacher Performance

Limited funding, unclear procedures, or stakeholder resistance are reported to be structural barriers that can be expected to impact the effectiveness of reform (OECD, 2019).

H6: Potential Challenges affect teachers' Key Performance Indicators (KPI).

Potential Challenges and Implementation Suggestions

Problems arising in rollout frequently lead to on-the-ground suggestions (Hoy & Miskel, 1991).

H7: Potential Challenges have positive impacts on Suggestions for Successful Implementation of the Teacher Licensing System.

Suggestions for Implementation and Teacher Performance

Suggestions for training and awareness campaigns, seeks to increase teaching effectiveness, but results might be contingent upon institutional preparedness (Avalos, 2011; Guskey, 2016).

H8: Suggestions for Successful Implementation positively affect teachers' Key Performance Indicators (KPI).

Teacher Licensing System and Role of Management

Despite the fact that licensing efforts are often successful, they depend largely on management's resolve to continue. (Fullan, 2016)

H9: Teacher Licensing System positively and significantly affects the Role of Management.

Teacher Licensing System and Potential Challenges

When new reforms are implemented, there are generally some organizational tensions, stemming from resource conflicts, communication issues or opposition, that arise in the early stages of implementation (Bush, 2007).

H10: Teacher Licensing System has a positive relationship with Potential Challenges in its implementation.

Summary of Hypotheses

Hypothesis	Path
H1	TLS → Teacher Performance (KPI)
H2	TLS → Performance Affected by Additional Responsibilities
H3	Role of Management → Teacher Performance
H4	Role of Management → Potential Challenges
H5	Role of Management → Implementation Suggestions
H6	Potential Challenges → Teacher Performance
H7	Potential Challenges → Implementation Suggestions
H8	Implementation Suggestions → Teacher Performance
H9	TLS → Role of Management
H10	TLS → Potential Challenges

METHODOLOGY

Research Design

The study employed a quantitative and cross-sectional approach with survey type, in order to test the structural relationship among the Teacher Licensing System, Role of Management, Potential Challenges, Suggestions for Implementation, and Teacher Performance. Structural Equation Modelling (SEM) was selected due to the fact that it enables estimation of multiple direct and indirect paths and formal measurement quality assessment together. We particularly employed the variance-based approach (Partial Least Squares SEM—PLS-SEM) in SmartPLS 4 that is appropriate for explorative, prediction-oriented models containing composite constructs (Hair et al. 2019).

Population and Sample

The target group included male and female teachers of secondary level schools in urban and rural tehsils of Punjab. The sampling was stratified to achieve a representative sample by district and school type. On data screening, a total of 770 valid responses were retained for analysis. Following Hair, Risher, Sarstedt, & Ringle (2019) rule of thumb of at least ten respondents per indicator for PLS-SEM, this sample comfortably exceeds the minimum required for stable estimation given the largest measurement block in the model.

Instrumentation

The questionnaire used in this study is the instrument we designed and psychometrically validated in our companion paper (Kamal & Saadi, 2025), which reports its item generation, expert content-validity review, and preliminary structural testing in detail. For the present study the validated instrument was administered in full, covering five constructs on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree):

- Teacher Licensing System (TLS) - e.g., “Teachers are familiar with the concept of a teacher licensing system”; “Teacher licensing will enhance the credibility of the teaching profession.”
- Role of Management (ROM) - e.g., “Management provides adequate training and support for teacher evaluation for licensing.”
- Potential Challenges (PC) - e.g., “Lack of financial resources”; “Resistance from political or bureaucratic entities.”
- Suggestions for Successful Implementation (SSI) - e.g., “Teachers should be involved in the development and implementation of the licensing system.”
- Teacher Performance / Key Performance Indicators (KPI) - covering subject knowledge, instructional practice, and professional conduct.

A panel of three academic experts - a senior professor, a teacher-training specialist, and a member of the provincial education department - reviewed the instrument for content validity and contextual fit prior to the pilot; several items were reworded in response to their feedback, consistent with the validation process reported in Kamal and Saadi (2025).

Pilot Testing and Reliability

The instrument was piloted with 10% of the target sample. Cronbach's alpha in the pilot exceeded 0.80 for every construct, indicating strong internal consistency. The full sample was subsequently used to re-examine reliability and validity through the measurement model in SmartPLS: Composite Reliability (CR) ranged from 0.90 to 0.97 and Average Variance Extracted (AVE) ranged from 0.56 to 0.79 across constructs, and discriminant validity was confirmed via the Fornell-Larcker criterion (Fornell & Larcker, 1981).

Data Collection Procedure

Data were collected over approximately four months using a combination of Google Forms and printed questionnaires distributed with the permission of school administrations. Teachers were briefed on the purpose of the study and gave informed consent; participation was voluntary and anonymous. Of the responses received, 770 were complete and usable for SEM analysis.

Data Analysis Technique

Analysis proceeded in the two stages recommended for PLS-SEM (Hair, Risher, Sarstedt, & Ringle 2019). The measurement model was first assessed for indicator reliability (factor loadings), internal consistency (Cronbach's alpha, CR), and convergent/discriminant validity (AVE, Fornell-Larcker criterion). The structural model was then estimated, with path coefficients (β), t-statistics, and p-values obtained through

bootstrapping with 5,000 resamples. Coefficient of determination (R^2) and predictive relevance (Q^2 , via blindfolding) were used to evaluate the model's explanatory and predictive power.

Ethical Considerations

Formal permission was obtained from the relevant provincial schooling authority (Directorate of Public Instructions, Punjab). Respondents provided informed consent, no personal identifiers were collected, and confidentiality was maintained throughout. The study adhered to standard institutional ethical guidelines for research involving human participants.

STRUCTURAL EQUATION MODELLING: RESULTS AND INTERPRETATION

Measurement Model

Table 1 summarises the measurement properties of the six constructs. Factor loadings across all retained items ranged from 0.562 to 0.923, comfortably above the 0.50 minimum recommended by Hair, Risher, Sarstedt, & Ringle (2019) and mostly above the more conservative 0.70 benchmark. Cronbach's alpha and Composite Reliability exceeded 0.85 for every construct, and AVE ranged from 0.506 to 0.791, confirming adequate convergent validity. A small number of items with loadings below 0.50 were dropped automatically by the software during model estimation; the itemised loadings for every retained indicator are reported in Appendix Table A1.

Table 1. Measurement model summary - reliability and convergent validity by construct.

Construct	No. of Items	Loading Range	Cronbach's Alpha	Composite Reliability	AVE
Teacher Licensing System (TLS)	10	0.806–0.923	0.970	0.974	0.791
Role of Management (ROM)	9	0.781–0.861	0.941	0.950	0.678
Potential Challenges (PC)	15	0.562–0.842	0.944	0.950	0.561
Suggestions for Successful Implementation (SSI)	17	0.566–0.791	0.952	0.945	0.506
Key Performance Indicators (KPI)	8	0.755–0.916	0.949	0.957	0.737
Performance Affected by Additional Responsibilities (PAR)	3	0.827–0.919	0.850	0.909	0.770

Discriminant Validity

Discriminant validity was assessed using the Fornell-Larcker criterion, which requires the square root of each construct's AVE (the diagonal in Table 2) to exceed its correlations with other constructs. This condition held for all six constructs, indicating that each captured a distinct dimension of the model rather than overlapping substantially with the others.

Table 2. Discriminant validity - Fornell-Larcker criterion (diagonal values are the square root of AVE).

Construct	1	2	3	4	5	6
1. Key Performance Indicators	0.859					
2. Performance Affected by Add'l Resp.	0.187	0.877				
3. Potential Challenges	0.341	0.463	0.749			
4. Role of Management	0.720	0.222	0.350	0.824		
5. Suggestions for Implementation	0.316	0.179	0.289	0.446	0.711	
6. Teacher Licensing System	0.749	0.008	0.227	0.727	0.390	0.889

Structural Model

Figure 2 reproduces the estimated structural model as generated in SmartPLS, showing the full set of measurement and structural paths together with their outer loadings and path coefficients. The Teacher Licensing System exerted a strong, positive influence on Key Performance Indicators ($\beta = 0.494$, $p < .001$) and, even more strongly, on the Role of Management ($\beta = 0.727$, $p < .001$), consistent with the theoretical expectation that management is the mechanism through which licensing policy is translated into practice. TLS also showed a significant negative relationship with performance affected by additional responsibilities ($\beta = -0.374$, $p < .001$).

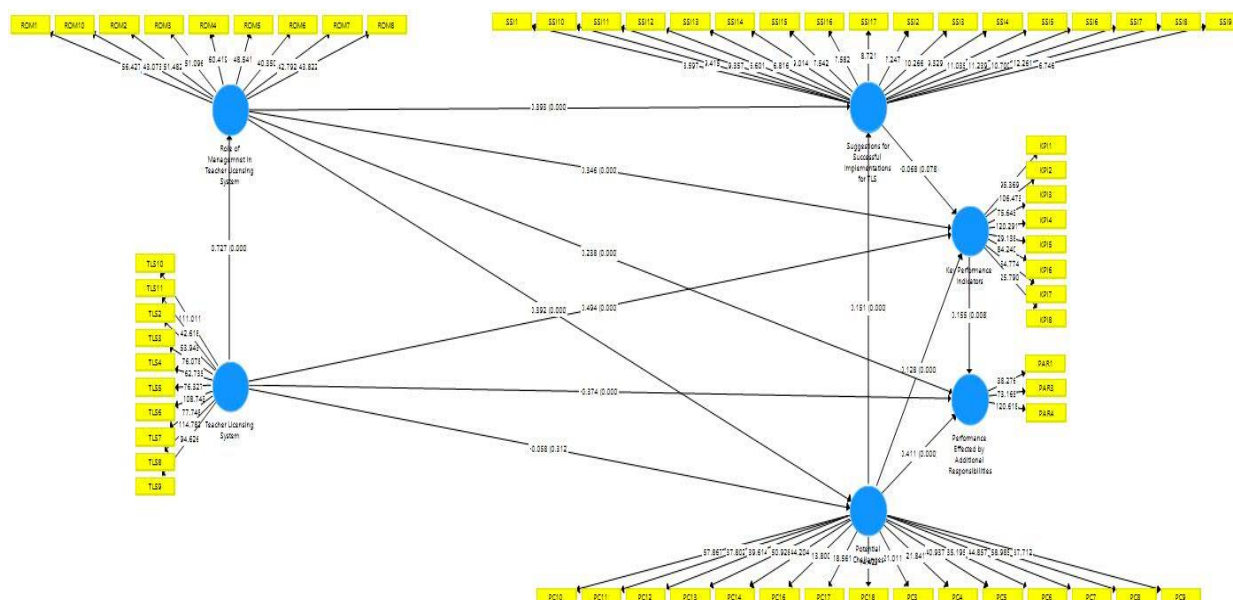


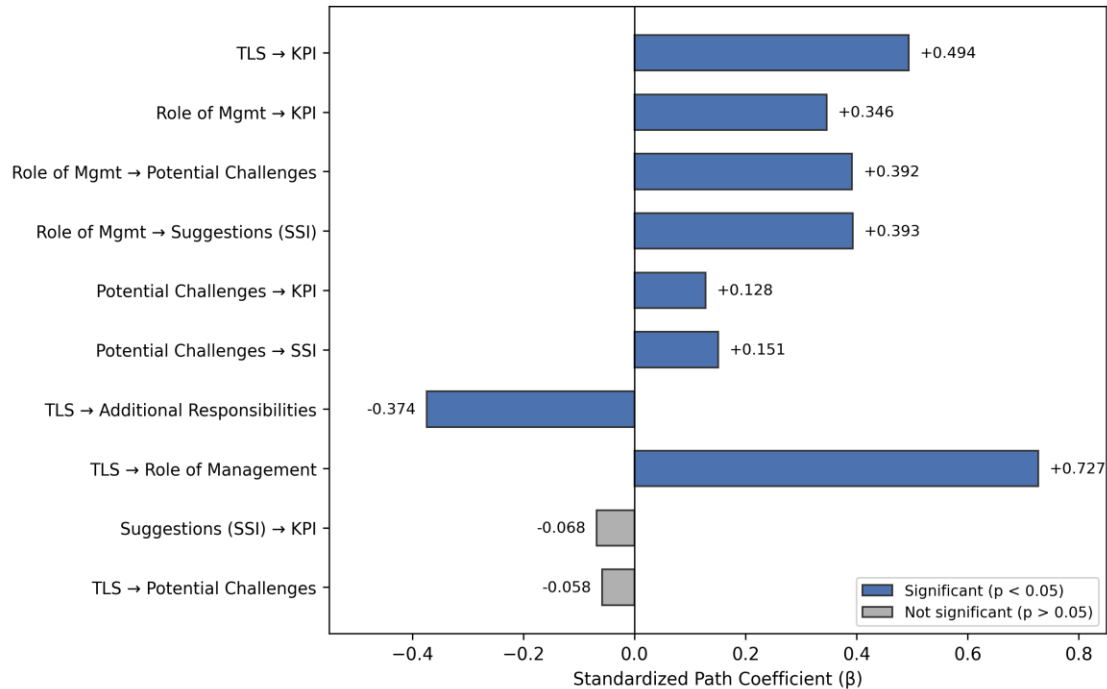
Figure 2. Estimated structural model (SmartPLS 4 output) showing standardised path coefficients among the six latent constructs.

The Role of Management emerged as a pervasive predictor across the model, with significant positive effects on Teacher Performance ($\beta = 0.346$, $p < .001$), Potential Challenges ($\beta = 0.392$, $p < .001$), and Suggestions for Implementation ($\beta = 0.393$, $p < .001$). Potential Challenges, in turn, showed small but significant positive relationships with both Teacher Performance ($\beta = 0.128$, $p < .001$) and Implementation Suggestions ($\beta = 0.151$, $p < .001$). Suggestions for Implementation did not have a significant direct effect on performance ($\beta = -0.068$, $p = .093$), and the TLS $\rightarrow$ Potential Challenges path was likewise non-significant ($\beta = -0.058$, $p = .273$). Full path statistics are reported in Table 3, and standardised coefficients are visualised in Figure 3.

Table 3. Structural model - path coefficients, t-statistics, and significance (bootstrapping, 5,000 resamples).

Path	β (O)	T Statistic	p
KPI $\rightarrow$ Performance Affected by Additional Responsibilities	0.155	2.792	0.005
Potential Challenges $\rightarrow$ KPI	0.128	5.472	0.000
Potential Challenges $\rightarrow$ Performance Affected by Additional Resp.	0.411	8.791	0.000
Potential Challenges $\rightarrow$ Suggestions for Implementation	0.151	3.945	0.000
Role of Management $\rightarrow$ KPI	0.346	7.451	0.000
Role of Management $\rightarrow$ Performance Affected by Additional Resp.	0.238	3.706	0.000
Role of Management $\rightarrow$ Potential Challenges	0.392	5.418	0.000
Role of Management $\rightarrow$ Suggestions for Implementation	0.393	7.828	0.000
Suggestions for Implementation $\rightarrow$ KPI	-0.068	1.681	0.093
TLS $\rightarrow$ KPI	0.494	12.572	0.000
TLS $\rightarrow$ Performance Affected by Additional Resp.	-0.374	6.760	0.000
TLS $\rightarrow$ Potential Challenges	-0.058	1.096	0.273
TLS $\rightarrow$ Role of Management	0.727	36.388	0.000

Figure 3. Standardized Path Coefficients of the Structural Model



Hypothesis Testing Summary

Table 4 maps the ten hypotheses onto their empirical results. Most paths were supported in the hypothesised direction. Four, however, were not: H4, H6, H8, and H10. These are discussed substantively in Section 7, since a purely mechanical “reject the hypothesis” treatment would understate what these results actually suggest about how management and challenges function in this context.

Table 4. Summary of hypothesis testing results

Hyp.	Path	β	p	Result
H1	TLS → KPI	0.494	0.000	Supported
H2	TLS → Additional Responsibilities (negative)	-0.374	0.000	Supported
H3	Role of Management → KPI	0.346	0.000	Supported
H4	Role of Management → Potential Challenges (negative)	+0.392	0.000	Not supported (opposite sign)
H5	Role of Management → Suggestions	0.393	0.000	Supported
H6	Potential Challenges → KPI (negative)	+0.128	0.000	Not supported (opposite sign)
H7	Potential Challenges → Suggestions	0.151	0.000	Supported
H8	Suggestions → KPI	-0.068	0.093	Not supported (n.s.)
H9	TLS → Role of Management	0.727	0.000	Supported

Hyp.	Path	β	p	Result
H10	TLS $\rightarrow$ Potential Challenges	-0.058	0.273	Not supported (n.s.)

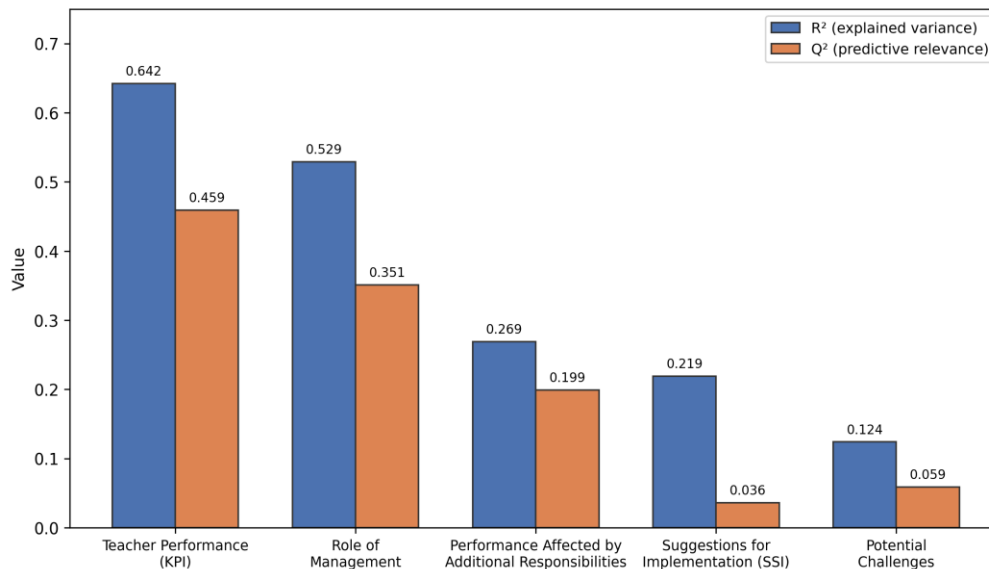
Model Fit and Predictive Power

The model explained 64.2% of the variance in Teacher Performance ($R^2 = 0.642$), 52.9% of the variance in the Role of Management, and 26.9% of the variance in Performance Affected by Additional Responsibilities. Q^2 values were positive for every endogenous construct, indicating acceptable predictive relevance in addition to in-sample explanatory power (Table 5, Figure 4).

Table 5. Coefficient of determination (R^2) and predictive relevance (Q^2) by construct.

Construct	R^2	Q^2	Interpretation
Key Performance Indicators (Teacher Performance)	0.642	0.459	Strong - 64% of variance explained
Role of Management	0.529	0.351	Strong
Performance Affected by Additional Responsibilities	0.269	0.199	Moderate
Suggestions for Implementation	0.219	0.036	Moderate, weak predictive relevance
Potential Challenges	0.124	0.059	Weak-to-moderate

Figure 4. Explained Variance (R^2) and Predictive Relevance (Q^2) by Construct



DISCUSSION

The most obvious note from these results is as unglamorous as it is important: A paper-based licensing system is not a real licensing system, and management is the space between. The direct effect of Teacher Licensing System on Key Performance Indicators ($\beta = 0.494$) corroborates what international literatures on the licensing and professional standards would suggest (Darling-Hammond, 2017; OECD, 2019) that there is an impact of Teacher Licensing System on Key Performance Indicators where credible Teacher Licensing System exists. What does the much larger path from TLS to the Role of Management ($\beta = 0.727$) tell us, however, is where the policy's energy is actually going: into activating management, which does much of the work in terms of converting the policy into energising performance gains. It is the very progression that Human Capital, Systems, and Transformational Leadership theory predict and that matches Fullan's (2016) longstanding belief that educational reform is rooted in the capacity of the leader, not the beauty of the policy text.

The negative path from TLS to Additional Responsibilities ($\beta = -0.374$) is consistent with a story of a workload substitution where, when teachers have the opportunity to engage in non-teaching responsibilities, the additional responsibilities do not seem to affect their performance. The negative path from TLS to Additional Responsibilities ($\beta = -0.374$) is consistent with a story of workload substitution, in which the presence of non-teaching responsibilities has little room to affect the teacher's performance when present and working. Both reading schools resonate with Skaalvik and Skaalvik's (2010) and Kyriacou's (2001) conclusions that competing demands on teachers' time undermine the professional advantages of any given reform, including licensing.

Four hypotheses did not follow the same pattern as we expected, however, and cannot be ignored, but deserve a serious consideration in its own right. There was a significant positive (not negative) correlation between Role of Management and Potential Challenges (H4) and a significant positive (not negative) correlation between Potential Challenges and Teacher Performance (H6). This is a seemingly paradoxical idea, more challenges, better performance? When viewed through the lens of the challenge-hindrance stressor framework (LePine, Podsakoff, & LePine, 2005), it's not so unusual. LePine, Podsakoff, & LePine demonstrate that demands can experience as challenges (problems that extend and stimulate employees) may have a positive correlation to performance, even if they are also experienced as pressure, but demands experienced only as hindrances may have a negative correlation. One plausible explanation for this is that failure to observe difficulties is not the result of active management, it is the result of engaged leaders who are not monitoring a reform closely who don't notice it and report it. Teachers working under more engaged management may therefore be simultaneously more aware of Potential Challenges and performing better, not because challenges cause better performance, but because both are downstream of the same active managerial engagement. This reading is consistent with Hallinger's (2018) point that leadership effects are highly context-dependent, and it is a genuinely useful finding for policymakers: a rise in reported challenges need not be read as a sign that licensing is failing; it may be a sign that people are paying attention to it.

Suggestions for Implementation did not significantly predict performance (H8, $\beta = -0.068$, $p = .093$), and TLS did not significantly predict Potential Challenges directly (H10, $\beta = -0.058$, $p = .273$; its effect on challenges appears to run through management rather than directly). The non-significant SSI $\rightarrow$ KPI path is easiest to interpret at face value: recommendations such as training or stakeholder collaboration take time, funding, and institutional commitment to enact, and their performance dividend is unlikely to appear in a single cross-sectional snapshot (Avalos, 2011; Guskey, 2016). This is a common finding in implementation research more broadly - stated intentions to improve a system are necessary but not sufficient for measurable short-term gains.

Overall, the model accounted for 64.2% of the variance in teacher performance, a level of explanatory power that would be considered strong by conventional PLS-SEM benchmarks (Hair, Risher, Sarstedt, & Ringle, 2019), and every endogenous construct retained positive predictive relevance under blindfolding. Substantively, the results reposition the debate about teacher licensing in Pakistan: the open question is not primarily whether licensing is a good idea, but whether the management infrastructure needed to run it is being built at the same pace as the policy itself.

PRACTICAL IMPLICATIONS

1. Policy Implication

Education departments should pair the licensing framework with clearly written implementation guidance so that teachers understand both the criteria being applied and the benefits attached to compliance.

2. Administrative Implication

EDOs, DEOs, and head teachers need to be active participants in monitoring, training, and supporting teachers through licensing, not passive conduits for paperwork, given how much of the model's explanatory power runs through the management construct.

3. Professional Development Implication

Sustained, structured professional learning - rather than one-off orientation sessions - should be built into the licensing cycle so that teachers are prepared for what evaluation actually requires of them.

4. Workload Management Implication

Non-teaching assignments should be minimised, or at least scheduled around licensing-related activity, to protect the instructional time that the licensing system is meant to improve.

CONCLUSION

This study examined the structural relationships among the Teacher Licensing System, Role of Management, Potential Challenges, Suggestions for Implementation, and Teacher Performance among secondary school teachers in Punjab, using the instrument validated in our companion paper (Kamal & Saadi, 2025) and Partial Least Squares Structural Equation Modelling. The Teacher Licensing System and the Role of Management were confirmed as the two strongest positive contributors to teacher performance, while additional non-teaching responsibilities continued to erode performance gains. Potential Challenges related to performance in a more complicated way than originally hypothesised, plausibly reflecting the fact that engaged management surfaces implementation problems rather than hiding them. Suggestions for Implementation, while highly appreciated by teachers and management, did not have an immediate, tangible impact on performance as indicated – but this is the nature of policy recommendations, which usually take some time to resourcing before the impact is felt in the outcome measures. The model accounts for 64.2% of the variance in teacher performance and offers a statistically sound explanation of how a licensing reform interacts with the institutional contexts in which it is implemented.

RECOMMENDATIONS

1. Develop a clear, contextualised licensing policy: provincial authorities should have an explicit licensing policy with clear performance criteria, renewal criteria and expectations for Professional Development that are appropriate to the Pakistani school system.
2. License managers (EDOs, DEOs, head teachers) should be trained regularly in monitoring and supporting the implementation of licensing, as management is the biggest leverage in this model.
3. Minimise non-teaching workload, teachers to be relieved, wherever possible, of frequent non-teaching duties during licensing rollout periods, such as election or census work.
4. Overcome resource and structural problems: sufficient financial, human, and technological resources must be provided to ensure that the licensing process of institutions, both rural and urban, will be equally accessible.
5. Encourage ongoing professional development: workshops, mentoring and peer collaboration must be clearly linked to licensing requirements, not be separate initiatives.
6. Improve stakeholder communication: good, sustained communication between teachers, management, unions and policy makers will help to turn reported “challenges” into positive feedback and ideas instead of resistance.
7. Conduct longitudinal monitoring: subsequent monitoring should follow the same institutions to determine if the Positive Potential-Challenges-to-Performance relationship holds true as the system evolves over time.

FINAL REMARK

A teacher licensing system is not the answer, it is an organisational commitment. If done with strong, dedicated leadership and if teachers have sufficient time to engage in the work that licensing requires, then it is possible to see that this commitment can play a meaningful role in improving the way teachers teach, as is illustrated here.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

Limitations

First, the cross-sectional design restricts causal interpretations because the associations reported here are limited to a single point in time longitudinal designs are required to increase confidence in causal conclusions. Second, the reported associations are limited to the sample of children studied.

Second, the data were self-reported, meaning that there is a potential for social desirability bias, especially in relation to management performance questions. Future work would be strengthened if triangulated with information from classroom observations or administrative records.

Third, the sampling was done from secondary level government schools in the province of Punjab; although stratified sampling is used to achieve representativeness within the schools sampled in the sample, the results cannot be generalized to the private sector schools or other provinces or other levels of schooling without further testing.

Fourth, this context study did not explore the decision-making processes of the policymaker or provincial-department in the design of the licensing upstream of the school, so qualitative research with policymakers would complement the teacher level data reported here.

Lastly, although the quantitative design was appropriate for testing the structural paths hypothesized, it is insufficient to explain the positive relationship between Potential Challenges and performance, and a follow-up study using a mixed-methods approach, combining the SEM with interviews, would help to differentiate between the challenge-stressor interpretation offered here and other plausible explanations.

Future Research Directions

1. Longitudinal and quasi-experimental designs tracking the same schools across licensing cycles.
2. Comparative analyses across public and private institutions, and across provinces, to test regional variation in implementation capacity.
3. Qualitative investigations (interviews, focus groups, case studies) to unpack the surprising Potential Challenges findings in more depth.
4. Policy evaluation studies comparing the proposed licensing system with existing teacher evaluation and promotion mechanisms.
5. Extension of the model to include teacher well-being and workload stress as explicit mediating variables.
6. Assessment of digital infrastructure and digital literacy as enablers of transparent, efficient licensing administration.

Closing Note

Combined with its companion paper on instrument validation (Kamal & Saadi, 2025), this study provides a validated tool for measuring, as well as an empirically tested model of the interrelationships between teacher licensing, management and workload in a real school system. Hopefully both pieces will be useful to researchers and policy makers who are attempting to design licensing systems, but also put them into practice.

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The author declares that her name appears as Bushra Mustafa Kamal in her CNIC and passport, whereas in her educational documents it is recorded as Bushra Gul Yousafzai. She is currently enrolled as a PhD scholar in Educational Planning and Management (EPM) at the Department of EPPSL, Allama Iqbal Open University, Islamabad.

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Appendix A. Item-Level Factor Loadings

Full item-level standardised factor loadings for all six constructs, supporting the construct-level summary reported in Table 1.

Construct	Item	Description	Loading
KPI	KPI1	Knowledge of subject matter	0.880
KPI	KPI2	Instructional practices	0.895
KPI	KPI3	Professional knowledge	0.893
KPI	KPI4	Classroom management skills	0.916
KPI	KPI5	Pedagogical skills	0.755
KPI	KPI6	Ethical conduct	0.888
KPI	KPI7	Continuous professional development	0.866
KPI	KPI8	Community and parental engagement	0.759
PAR	PAR1	Polio vaccination duties	0.827
PAR	PAR3	Awareness drives (dengue/COVID-19)	0.884
PAR	PAR4	Election duties	0.919
PC	PC10	Difficulty establishing benchmark criteria	0.813
PC	PC11	Lack of consensus on standard criteria	0.815
PC	PC12	Difficulty ensuring fairness/equity in evaluation	0.783
PC	PC13	Lack of communication of licensing goals	0.832
PC	PC14	Additional burden on administration/management	0.842
PC	PC16	Implementation will be expensive	0.573
PC	PC17	Implementation will be time-consuming	0.649
PC	PC18	May discourage talented individuals from entering teaching	0.562
PC	PC3	Lack of human resources	0.637

Construct	Item	Description	Loading
PC	PC4	Lack of technological resources	0.672
PC	PC5	Resistance from school administrators/management	0.830
PC	PC6	Resistance from school teachers	0.773
PC	PC7	Resistance from school associations/unions	0.803
PC	PC8	Resistance from political/bureaucratic entities	0.823
PC	PC9	Resistance from cultural/societal norms	0.738
ROM	ROM1	Provides clear guidelines/standards	0.836
ROM	ROM10	Promotes trust among teachers	0.814
ROM	ROM2	Provides sufficient resources	0.806
ROM	ROM3	Provides adequate training/support for evaluation	0.781
ROM	ROM4	Actively monitors effectiveness	0.861
ROM	ROM5	Actively evaluates effectiveness	0.842
ROM	ROM6	Involves teachers in development	0.807
ROM	ROM7	Involves teachers in implementation	0.832
ROM	ROM8	Addresses concerns raised by teachers	0.831
SSI	SSI1	Teachers involved in development	0.620
SSI	SSI2	Teachers involved in implementation	0.566
SSI	SSI3	Management involved in development	0.620
SSI	SSI4	Management involved in implementation	0.750
SSI	SSI5	Management involved in evaluation	0.752
SSI	SSI6	PD training - management (implement)	0.791
SSI	SSI7	PD training - management (monitor)	0.756
SSI	SSI8	PD training - management (evaluate)	0.741
SSI	SSI9	PD training - teachers (implement)	0.669
SSI	SSI10	PD training - teachers (monitor)	0.734
SSI	SSI11	PD training - teachers (evaluate)	0.768
SSI	SSI12	Financial incentives for implementation	0.664
SSI	SSI13	Public awareness campaigns	0.695
SSI	SSI14	Access to assessment tools and rubrics	0.733
SSI	SSI15	Collaboration with other schools	0.709
SSI	SSI16	Collaboration with school associations/unions	0.729
SSI	SSI17	PD training - teachers (monitor, extended)	0.750

Construct	Item	Description	Loading
TLS	TLS2	Need for licensing in our context	0.851
TLS	TLS3	May ensure quality of education	0.910
TLS	TLS4	Can help retain high-performing teachers	0.894
TLS	TLS5	May identify areas of improvement	0.883
TLS	TLS6	Will enhance credibility of the profession	0.915
TLS	TLS7	Will lead to increased accountability	0.915
TLS	TLS8	May motivate teachers to improve practice	0.923
TLS	TLS9	May contribute to professional growth	0.908
TLS	TLS10	Will help address gaps in teacher skills	0.881
TLS	TLS11	Will make the profession more valued	0.806