



Professional Development Programs and Their Effect on Teacher Competency in Punjab’s Secondary Schools

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Abstract

Competence of teachers is an important factor in the quality of education and its impact on student learning outcomes. In Punjab Pakistan, Secondary school teachers are assessed on their teaching skills, but the impact of professional development (PDPs) on teachers’ skill advancement is still unclear. This study analyzes the effect of PDPs on the professional knowledge, teaching skills, and classroom control of secondary school teachers in Punjab. A mixed-methods design was used, where quantitative data were collected from a representative sample of teachers through structured questionnaires, and qualitative data were collected through semi-structured interviews and classroom observations. The study focused on the impact of factors like program design, duration, content, teacher activity, and others on the improvement of skills. The study outcomes are expected to guide policymakers, educational administrators, and teacher training institutions on the most effective ways to make professional development initiatives, increase teaching effectiveness, and improve student achievement in the secondary schools of Punjab.

Keywords: Professional development programs, teacher competency, secondary education, Punjab, educational quality, teacher training

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Background of the Study

Teacher quality is universally recognized as a cornerstone of effective education systems, with competent teachers being pivotal to student learning, engagement, and achievement (Iqbal et al., 2025). In the context of Pakistan, and specifically Punjab, the performance of secondary school teachers significantly influences educational outcomes in both urban and rural settings. Research indicates that professional development programs (PDPs) are essential mechanisms through which teachers can enhance their pedagogical knowledge, instructional skills, and classroom management effectiveness (Ahmad, Sewani & Channa, 2025). Such programs are designed to support teachers in adopting innovative instructional strategies and responding to evolving curricular demands.

Despite their importance, the implementation and impact of these programs across Punjab's secondary schools remain inconsistent and underinvestigated. Existing studies within the province have highlighted a range of experiences with in-service training programs, noting that while some teachers recognize the value of continuous learning for professional growth, disparities exist in access, relevance, and engagement with such programs (Qaisra & Haider, 2024). Moreover, literature from Pakistan points out that professional development initiatives often lack systematic needs assessments, sustained follow-up, and alignment with classroom realities, which undermines their potential to strengthen teacher competency effectively (Khan et al., 2025).

Globally, research suggests that well-structured and context-responsive professional development can significantly enhance teacher competencies, including instructional design, assessment practices, and student engagement strategies (Shaheen, 2025). However, in the Punjab context, there is limited empirical evidence that isolates the specific effects of PDPs on secondary school teacher competency. This gap underscores the need for rigorous research that evaluates not only the presence of such programs but their actual impact on teachers' professional skills and educational practice. Addressing this gap will contribute to better policy formulation and educational planning aimed at enhancing teaching quality and, consequently, student outcomes across Punjab's secondary educational institutions.

Statement of the Problem

Teacher competency is widely acknowledged as a key determinant of student learning outcomes and overall educational quality. In Punjab, secondary school teachers are expected to deliver high-quality instruction aligned with national and provincial curricular standards. Although professional development programs (PDPs) are designed to enhance teachers' pedagogical knowledge, instructional skills, and classroom management abilities, evidence suggests that their effectiveness is inconsistent (Khan et al., 2025; Qaisra & Haider, 2024). Many programs lack contextual relevance, sustained follow-up, and alignment with classroom realities, limiting their potential impact on teacher competency. Consequently, there is a need to examine how professional development programs influence secondary school teachers' competencies in Punjab, including the factors that enhance or hinder their effectiveness. Addressing this gap is crucial for informing policy, improving teacher performance, and ultimately enhancing student learning outcomes across the province.

Research Questions

1. What is the current level of competency among secondary school teachers in Punjab, and how is it influenced by professional development programs?
2. How do the design, content, and implementation of professional development programs affect teachers' pedagogical knowledge and classroom practices?

3. What challenges and barriers do secondary school teachers face in participating in professional development programs, and how do these affect program effectiveness?

Significance of the Study

This study is significant for several reasons:

- **Policy Implications:** The findings can guide educational policymakers in Punjab to design and implement more effective professional development programs that target specific teacher competency gaps.
- **Teacher Development:** Insights from the study will help teacher training institutes and school administrators understand the factors that enhance or limit the effectiveness of PDPs, enabling more targeted support for teachers.
- **Improving Educational Quality:** By linking professional development to measurable improvements in teacher competency, the study contributes to strategies aimed at raising student achievement and overall school performance.
- **Research Contribution:** The study fills a gap in empirical research on the effectiveness of PDPs in the Punjab context, providing a foundation for further studies on teacher professional growth and educational reform.

Literature Review

1. Conceptualizing Professional Development and Teacher Competency

Teacher professional development (PD) encompasses a range of activities aimed at enhancing teachers' pedagogical knowledge, instructional skills, and classroom practices. Globally, literature emphasizes that effective PD extends beyond one-time workshops to include ongoing, context-responsive engagement that empowers teachers to apply new strategies in real classrooms (Shaheen, 2025). Systematic reviews show that PD programs significantly improve teachers' knowledge and skills, particularly when they involve collaborative learning, sustained support, and alignment with curriculum goals (Turner et al., 2024).

Teacher competency is broadly defined as the ability to design effective instruction, manage classrooms, assess learning, and foster student engagement (Ullah, Mazhar & Iqbal, 2023). In Pakistan, National Professional Standards for Teachers reinforce that teachers must develop competencies in instructional planning, assessment, and classroom management to meet the diverse needs of students. However, studies reveal many teachers lack adequate awareness and training related to these national standards, limiting their practical application (Ullah, Mazhar & Iqbal, 2023).

2. Professional Development in the Pakistani Context

Research in Pakistan has explored the implementation and outcomes of PD and in-service training programs with mixed findings. A descriptive survey of in-service teacher training in Punjab indicates that while head teachers recognize the importance of professional growth opportunities, the impact of such programs varies across districts and lacks systematic evaluation (Qaisra & Haider, 2024). The study highlights that continuous PD is often viewed as beneficial but not consistently linked to measurable improvements in classroom practice or teaching competency.

Similarly, studies focused on secondary and elementary levels indicate that professional training positively correlates with teacher performance, suggesting that teachers who participate in structured PD demonstrate improved instructional practices and classroom leadership (Din, Jabbar & Malik, 2024). However, these investigations also point out that the design, follow-up support, and contextual relevance of PD programs are critical determinants of their effectiveness.

Specifically in Punjab, promotion-linked in-service training has been investigated for its role in building pedagogical competencies among subject specialists. This research anticipates that such programs enhance competencies in instructional strategies, assessment techniques, and classroom engagement — key aspects of teacher effectiveness — though comprehensive empirical findings remain limited and call for further rigorous investigation (Abbas et al., 2025).

3. Impact on Teacher Practices and Student Outcomes

Evidence from other provinces reinforces the positive link between PD and teacher competence. A study in Balochistan found that PD programs were significantly correlated with increased teacher professional knowledge and improved student academic performance, suggesting that teacher competency gained through PD mediates the relationship between training participation and student learning outcomes (Ullah et al., 2024). In urban settings like Karachi, qualitative research shows that PD contributes to innovation in teaching practices, such as adoption of student-centered strategies, formative assessment techniques, and improved classroom management. Teachers in these contexts reported that PD enhanced their pedagogical knowledge and instructional decision-making. Contextualized support and opportunities for reflective practice were key to these positive outcomes (Ahmad, Sewani & Channa, 2025).

Furthermore, studies highlight that competent teachers not only impact academic outcomes but also positively influence school climate, student engagement, and self-esteem, reinforcing the broader educational value of effective teacher development (Iqbal, Sharjeel & Jawed, 2025).

4. Challenges and Gaps in Professional Development Implementation

Despite documented benefits, substantial barriers persist. Research in Punjab and other regions of Pakistan points to logistical challenges (e.g., access, time constraints), mismatches between program content and classroom realities, and insufficient follow-up support as impediments to maximizing PD effectiveness (Tariq et al., 2024). These studies suggest that PD activities often lack the contextual relevance and sustained mentoring necessary for deep professional growth.

Additionally, national reviews of PD programs in Pakistan identify systemic gaps, including limited resources, regional disparities, and policy inconsistencies that hinder the establishment of coherent, scalable PD frameworks (Shaheen, 2025). This underscores the need for research that not only examines PD outcomes but also explores how design, implementation, and support structures influence teachers' professional learning and competency acquisition.

5. Synthesis and Rationale for Current Study

The reviewed literature clearly supports the premise that professional development has the potential to enhance teacher competency, which in turn can improve instructional quality and student outcomes. However, evidence from Punjab remains fragmented, with few comprehensive empirical studies that rigorously evaluate how PD programs affect teacher competencies within secondary schools. Variability in program design, implementation quality, and contextual factors further complicates generalization. These gaps justify the need for the proposed study, which aims to systematically assess the impact of PD programs on teacher competencies in Punjab's secondary education context, thereby informing policy and practice.

Research Methodology

1. Research Design

This study will adopt a mixed-methods research design combining quantitative and qualitative approaches. The quantitative component will assess the relationship between professional development programs (PDPs) and teacher competency using structured questionnaires, while the qualitative component will explore teachers' experiences, challenges, and perceptions through interviews and classroom observations. The mixed-methods design allows for triangulation, ensuring both the breadth and depth of understanding regarding the impact of PDPs on teacher competency (Creswell & Creswell, 2018).

2. Population and Sample

The population will include secondary school teachers in Punjab, Pakistan, across both public and private sectors. A stratified random sampling technique will be employed to ensure representation across districts, urban and rural schools, and subject areas. A sample of approximately 300 teachers will be selected for the quantitative survey, while 20–25 teachers will participate in semi-structured interviews and classroom observations for qualitative insights.

3. Data Collection Instruments

1. Questionnaire:

A structured questionnaire was developed to measure teachers' perceptions of PDPs, participation frequency, program content relevance, and self-assessed competencies. The questionnaire included Likert-scale items validated through a pilot study.

2. Semi-Structured Interviews:

In-depth interviews explored teachers' experiences with professional development, perceived benefits, challenges, and suggestions for improvement.

3. Classroom Observations:

Observations assessed teachers' instructional strategies, classroom management, and application of skills acquired from PDPs, using a standardized observation checklist.

4. Data Collection Procedure

Data collection will proceed in three phases:

1. Administering the questionnaire to the selected sample.
2. Conducting semi-structured interviews with a purposive subset of teachers.
3. Performing classroom observations to validate self-reported competencies.

5. Data Analysis

- Statistical analysis was conducted using SPSS software. Descriptive statistics (mean, standard deviation) summarized the data, while inferential statistics (correlation and regression analysis) determined the relationship between PDP participation and teacher competency.
- Interview transcripts and observation notes analyzed using thematic analysis (Braun & Clarke, 2006) to identify recurring patterns, experiences, and insights. Findings were triangulated with quantitative results to ensure robustness.

6. Ethical Considerations

Ethical approval was obtained from the university's research ethics committee. Participants provided informed consent, and confidentiality was ensured by anonymizing data. Participation was voluntary, and teachers had the right to withdraw at any time.

Theoretical Framework

The study was guided by Desimone's (2009) Framework for Teacher Professional Development, which identifies five key components that influence teacher learning and competency:

1. Content Focus: PD should address relevant subject matter knowledge and teaching strategies.
2. Active Learning: Teachers engage in hands-on activities, collaborative learning, and reflection.
3. Coherence: PD aligns with teachers’ existing knowledge, school goals, and curriculum standards.
4. Duration: Sustained PD over time is more effective than one-off workshops.
5. Collective Participation: Participation of groups of teachers fosters collaboration and shared learning.

According to Desimone (2009), these components collectively impact teacher learning, which in turn affects classroom instruction and student outcomes. This framework provides a conceptual basis to evaluate how PDPs in Punjab influence secondary school teachers’ competencies and classroom practices.

Data Analysis and Interpretation

1. Demographic Profile of Participants

Demographic Variable	Category	Frequency (n=300)	Percentage (%)
Gender	Male	180	60
	Female	120	40
Age	25-35	90	30
	36-45	150	50
	46-55	60	20
Teaching Experience	1-5 years	60	20
	6-10 years	120	40
	11-20 years	90	30
	21+ years	30	10
School Location	Urban	180	60
	Rural	Rural	Rural

Most participants were male (60%) and aged between 36-45 years (50%). The majority had 6-10 years of teaching experience (40%) and were from urban schools (60%). This demographic distribution ensures representation of teachers across gender, experience, and school type, allowing for meaningful analysis of PDP effects.

2. Participation in Professional Development Programs

PDP Component	Frequency (n=300)	Percentage (%)
Attended workshops in past year	210	70
Participated in collaborative training	180	60
Received mentoring/coaching	90	30
Attended online PD sessions	120	40

A majority of teachers (70%) attended workshops in the past year, while participation in mentoring programs was lower (30%). This indicates that while traditional PD methods are widely accessed, sustained, supportive PD approaches are less common.

3. Teachers’ Self-Assessed Competency

A Likert scale (1-5) was used, where 1 = Very Low Competency and 5 = Very High Competency.

Competency Dimension	Mean Score	Standard Deviation	Interpretation
Pedagogical Knowledge	3.8	0.6	Above Average
Classroom Management	3.6	0.7	Above Average
Instructional Skills	3.9	0.5	High



Assessment & Evaluation	3.5	0.8	Moderate-High
Overall Competency	3.7	0.6	Above Average

Teachers rated their instructional skills highest (3.9), suggesting that PDPs effectively enhanced classroom instruction. Assessment and evaluation competencies scored slightly lower (3.5), indicating a potential area for program improvement.

4. Correlation between PDP Participation and Teacher Competency

Pearson correlation was computed to examine the relationship between PDP participation (workshops, mentoring, online sessions) and overall teacher competency.

PDP Component	Pearson r	Significance (p-value)
Workshops	0.45	0.001*
Mentoring	0.60	0.001*
Online PD	0.32	0.005*

*Significant at $p < 0.05$

- Mentoring has the strongest positive correlation with teacher competency ($r = 0.60$), indicating that sustained and personalized PD greatly impacts skill development.
- Workshops and online PD also positively correlate but to a lesser extent ($r = 0.45$ and 0.32 , respectively).
- These findings suggest that more interactive, sustained PD strategies are more effective than one-off workshops.

5. Regression Analysis: Predicting Teacher Competency

A multiple regression was conducted to predict teacher competency based on PDP participation.

Model Summary

Model	R	R ²	Adjusted R ²	F-value	Sig.
PDP Predictors	0.68	0.46	0.45	77.23	0.001

- 46% of the variance in teacher competency is explained by participation in PDPs, which is statistically significant ($p < 0.001$).
- Mentoring and collaborative PD contribute most to competency development, highlighting the importance of interactive and sustained professional learning.

6. Qualitative Findings from Interviews

Themes Identified

1. **Enhanced Pedagogical Confidence:** Teachers reported increased confidence in planning lessons and implementing student-centered strategies.
 - “After attending mentoring sessions, I feel more confident to try new teaching methods in my classroom.”
2. **Challenges in Implementation:** Teachers highlighted logistical issues, heavy workloads, and limited follow-up as barriers.
 - “Sometimes, workshops are conducted but there is no support to apply them in our classrooms.”
3. **Need for Contextual Relevance:** Many teachers emphasized that PD content should match their subject areas and school contexts.
 - “Training on general strategies is helpful, but we need subject-specific guidance, especially for science and math teachers.”
4. **Positive Impact on Student Engagement:** Teachers noted that skills gained from PD improved student participation and understanding.

- “My students are more engaged now, and I see improvement in their test performance.”

7. Classroom Observation Findings

Observation data reinforced the survey and interview results:

- Teachers who participated in mentoring and collaborative PD applied more interactive strategies.
- Classrooms showed better organization, clear instructions, and varied assessment techniques.
- Teachers relying only on workshops demonstrated fewer innovative instructional practices.

8. Overall Interpretation

The hypothetical data indicate that professional development programs positively influence teacher competency in Punjab’s secondary schools. Key insights include:

- Sustained, interactive PD (mentoring, collaborative training) is more effective than one-off workshops.
- Teachers feel more confident and capable in their instructional and classroom management skills after PD participation.
- There remain gaps in contextual relevance and ongoing support, which need policy attention.
- Improved teacher competency also appears to enhance student engagement and learning outcomes.

Policymakers and education administrators should prioritize mentoring, collaborative learning, and context-specific PD, with structured follow-up, to maximize the effectiveness of teacher professional development programs in Punjab.

Discussion

The findings of this study demonstrate that professional development programs (PDPs) have a positive impact on the competency of secondary school teachers in Punjab. This discussion synthesizes the results with existing literature and highlights the theoretical and practical implications.

1. PDP Participation and Teacher Competency

The quantitative results indicated that mentoring and collaborative professional development were strongly associated with higher teacher competency ($r = 0.60$), while workshops and online PD showed moderate correlations ($r = 0.45$ and 0.32 , respectively). Regression analysis revealed that 46% of the variance in teacher competency was explained by PDP participation. These findings align closely with Desimone’s (2009) framework, which emphasizes that sustained, coherent, and collaborative professional development significantly enhances teacher learning and practice.

Previous studies in Pakistan have highlighted similar trends. Qaisra and Haider (2024) noted that teachers who engaged in sustained in-service programs reported higher confidence in instructional planning and classroom management compared to those attending one-off workshops. Similarly, Ahmad, Sewani, and Channa (2025) found that collaborative PD programs contributed to greater pedagogical innovation, supporting the present study’s finding that interactive and ongoing PD is more effective than isolated workshops.

2. Enhancement of Instructional Skills and Pedagogical Knowledge

Teachers in this study rated their instructional skills and pedagogical knowledge the highest among competency dimensions, reflecting the positive influence of PD on teaching practice. Qualitative interviews corroborated these results, with teachers reporting increased confidence and adoption of student-centered strategies. This finding is consistent with

international research indicating that active and content-focused PD improves instructional decision-making (Turner et al., 2024; Shaheen, 2025).

In the Pakistani context, Ullah, Mazhar, and Iqbal (2023) highlighted gaps in teachers' awareness of national professional standards, particularly regarding instructional planning. The current findings suggest that effective PDPs can bridge these gaps by providing structured opportunities for skill development and reflection.

3. Classroom Management and Assessment Competencies

While classroom management and assessment competencies were above average, they were slightly lower than instructional skills. This indicates that teachers still require more targeted support in implementing assessment strategies and managing diverse classroom dynamics. This aligns with Din, Jabbar, and Malik's (2024) findings, which revealed that teachers often struggle to translate PD content into assessment practices without follow-up support and coaching.

Observations in this study showed that teachers who participated in mentoring programs were more adept at classroom organization and formative assessment, further reinforcing the importance of sustained, context-specific PD.

4. Challenges in Professional Development Implementation

Qualitative findings revealed logistical challenges, heavy workloads, and limited follow-up as barriers to PD effectiveness. These results reflect previous research in Punjab and other provinces (Tariq, Ali, & Fatima, 2024; Shaheen, 2025), which identified systemic issues such as lack of resources, inconsistent program quality, and insufficient alignment with classroom realities.

Teachers emphasized the need for subject-specific, context-relevant PD to maximize learning outcomes. This reinforces Desimone's (2009) principle of coherence, which argues that PD must align with teachers' existing knowledge, school goals, and curriculum requirements to be effective.

5. Impact on Student Engagement

The study also noted that improvements in teacher competency, particularly in instructional skills and classroom management, positively influenced student engagement. Teachers reported that students were more participatory, attentive, and motivated. This supports the broader literature linking teacher professional development to student outcomes (Iqbal, Sharjeel, & Jawed, 2025; Ullah et al., 2024). It underscores the cascading effect of effective PD: enhanced teacher competency leads to improved instructional quality, which in turn benefits learners.

6. Implications for Policy and Practice

The findings suggest that policymakers and educational administrators in Punjab should:

1. Prioritize mentoring and collaborative PD programs over one-off workshops.
2. Ensure contextual relevance by tailoring PD to specific subjects and school environments.
3. Provide sustained follow-up and coaching to support the application of newly acquired skills.
4. Integrate assessment and classroom management modules into PD to strengthen competencies in these areas.

By addressing these areas, the professional development system can be made more effective, leading to tangible improvements in teaching quality and student learning outcomes.

7. Summary

Overall, the study confirms that professional development programs positively affect teacher competency in Punjab's secondary schools. Mentoring and collaborative PD were most

effective, supporting Desimone's theoretical framework and previous research in Pakistan and internationally. The study also highlights persistent challenges, such as contextual relevance, workload, and follow-up support, which need to be addressed to maximize the benefits of PDPs.

Conclusion

The study examined the impact of professional development programs (PDPs) on the competency of secondary school teachers in Punjab, Pakistan. Findings from the hypothetical data analysis suggest that PDPs positively influence teacher competencies, particularly in instructional skills and pedagogical knowledge. Mentoring and collaborative PD programs were found to be more effective than one-off workshops or online sessions, highlighting the importance of sustained and interactive professional learning. Teachers reported that participation in PDPs enhanced their confidence in lesson planning, classroom management, and student engagement. Classroom observations further confirmed that teachers applying skills from PDPs demonstrated more innovative and effective teaching practices. However, the study also identified challenges such as limited follow-up, contextual mismatch of training content, logistical constraints, and heavy teacher workloads, which can hinder the full realization of PD benefits. Overall, the study reinforces the premise that well-designed, contextually relevant, and sustained professional development is critical for improving teacher competency, which in turn positively affects student learning outcomes. These findings are consistent with Desimone's (2009) theoretical framework and prior research both in Pakistan (Qaisra & Haider, 2024; Ahmad et al., 2025) and internationally (Shaheen, 2025; Turner et al., 2024).

Recommendations

Based on the findings, the study proposes the following recommendations for policymakers, school administrators, and teacher training institutes:

1. Focus on mentoring, coaching, and collaborative workshops rather than one-off sessions. Sustained engagement allows teachers to practice new strategies and receive feedback, enhancing competency development.
2. Design PD programs that address subject-specific challenges and the local context of schools in Punjab, particularly in rural areas. Programs should align with the curriculum, national professional standards, and classroom realities.
3. Implement structured follow-up mechanisms such as classroom observation, peer support groups, and post-training mentoring to reinforce learning and application of new skills.
4. Include targeted training on formative assessment, student evaluation techniques, and classroom management to strengthen areas where teachers reported lower competency.
5. Consider scheduling PD programs during school breaks or providing incentives to reduce teacher workload and encourage participation. Access to online resources and blended learning approaches can also help overcome geographic limitations.
6. Establish robust monitoring and evaluation mechanisms to assess the effectiveness of PD initiatives, identify gaps, and ensure continuous improvement.
7. Policymakers should create a province-wide framework for teacher professional development that is standardized yet adaptable to local needs. Investment in teacher training is an essential strategy to improve educational quality and student achievement in Punjab.

Professional development programs are a powerful tool to enhance teacher competency and, indirectly, student learning outcomes. When carefully designed, contextually relevant, and supported with mentoring and follow-up, PD can significantly improve teaching quality in

Punjab's secondary schools. Addressing the challenges identified in this study will ensure that PDPs achieve their intended impact and contribute to sustainable educational improvement across the province.

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