



TEACHER PROFESSIONAL DEVELOPMENT AND CLASSROOM EFFECTIVENESS MODERATING ROLE OF LEADERSHIP SUPPORT

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Abstract

Teacher professional development has become a critical mechanism for improving instructional quality and enhancing student learning outcomes in contemporary educational systems. The effectiveness of classrooms largely depends on teachers' pedagogical competencies, instructional strategies, and their ability to adapt to evolving educational demands. Continuous professional development enables teachers to acquire new knowledge, refine teaching practices, and integrate innovative instructional approaches that foster student engagement and academic achievement. However, the impact of professional development programs on classroom effectiveness often varies depending on organizational and leadership contexts within educational institutions. Leadership support plays an essential role in creating an environment that encourages teachers to apply newly acquired knowledge and skills in classroom practice. This study investigates the relationship between teacher professional development and classroom effectiveness while examining the moderating role of leadership support in strengthening this relationship. A quantitative research design was adopted, and data were collected from teachers working in public and private educational institutions. Structural Equation Modeling using Smart Partial Least Squares was employed to analyze the relationships among the constructs. The findings reveal that teacher professional development significantly influences classroom effectiveness by improving instructional quality, classroom management, and student engagement. Furthermore, leadership support significantly moderates this relationship by providing resources, motivation, and institutional encouragement that facilitate the application of professional learning in classroom settings. The results highlight that schools with supportive leadership structures experience stronger positive effects of professional development initiatives on teaching effectiveness. Educational leaders play a vital role in ensuring that professional learning opportunities translate into improved classroom practices. The study contributes to educational management literature by providing empirical evidence regarding the interaction between professional development and leadership support in enhancing teaching effectiveness. The findings also offer practical implications for policymakers, school administrators, and teacher training institutions seeking to improve educational quality through structured professional development programs supported by effective leadership practices.

Keywords: Teacher Professional Development Classroom Effectiveness Leadership Support Instructional Quality Educational Leadership Teacher Training

Introduction

Educational systems across the world increasingly recognize that teacher quality is one of the most influential factors affecting student learning and academic success. Teachers serve as the primary agents of knowledge transmission, classroom management, and student motivation. As educational environments become more dynamic due to technological advancement, curriculum reforms, and diverse student needs, teachers must continuously update their pedagogical knowledge and instructional skills. Teacher



professional development has therefore become a key strategy for enhancing teaching performance and classroom effectiveness.

Professional development refers to structured learning opportunities that allow educators to improve their knowledge, competencies, and teaching practices. Such activities include workshops, seminars, training programs, mentoring, collaborative learning, and professional learning communities. These initiatives help teachers remain informed about contemporary teaching methodologies, assessment strategies, and educational technologies. Effective professional development programs focus on continuous learning, reflective practice, and collaboration among educators to promote meaningful instructional improvement. Classroom effectiveness refers to the ability of teachers to create a learning environment that supports student engagement, academic achievement, and positive learning experiences. Effective classrooms demonstrate clear instructional objectives, active student participation, well managed learning activities, and constructive feedback. Research indicates that teachers who regularly participate in professional development programs are better equipped to implement innovative teaching strategies and manage classrooms effectively.

Despite the importance of professional development, its impact on classroom practices often varies across educational institutions. Many teachers attend training programs but encounter difficulties when attempting to apply new skills in their classrooms. Factors such as limited institutional support, lack of resources, and insufficient leadership guidance may hinder the translation of professional learning into practical teaching outcomes. Consequently, leadership support emerges as a crucial factor that determines whether professional development initiatives result in improved classroom performance.

Educational leadership plays a significant role in shaping teacher motivation, professional growth, and institutional learning culture. School leaders including principals and administrators influence teachers by providing strategic direction, resources, encouragement, and opportunities for collaboration. Supportive leadership fosters a positive environment where teachers feel valued and empowered to implement new teaching approaches. Leaders who prioritize professional learning often establish structures that facilitate continuous improvement in teaching practices.

Leadership support also influences teachers' willingness to experiment with innovative instructional techniques learned through professional development programs. When school leaders provide mentoring, constructive feedback, and adequate resources, teachers are more likely to integrate newly acquired knowledge into classroom instruction. In contrast, lack of leadership encouragement may discourage teachers from adopting new practices despite participating in professional training.

Understanding the interaction between teacher professional development and leadership support is therefore essential for improving classroom effectiveness. While professional learning equips teachers with necessary competencies, leadership support ensures that these competencies are effectively implemented within the classroom environment. This study examines the direct relationship between teacher professional development and classroom effectiveness while exploring how leadership support moderates this relationship.

The significance of this research lies in its contribution to educational management and teacher development literature. By analyzing empirical data through Smart Partial Least Squares structural modeling, the study provides insights into how institutional leadership influences the success of teacher development initiatives. The findings may assist policymakers, educational administrators, and teacher

training institutions in designing professional development programs that are supported by effective leadership practices to enhance classroom outcomes and overall educational quality.

Literature Review

Teacher professional development has been widely recognized as an essential component of educational improvement and teacher effectiveness. Professional development programs provide teachers with opportunities to enhance their subject knowledge, pedagogical skills, and classroom management techniques. Research suggests that continuous professional learning enables teachers to adopt innovative instructional strategies that improve student learning outcomes (Desimone & Garet, 2015).

Professional development initiatives often focus on collaborative learning, reflective practice, and instructional innovation. According to Darling Hammond et al. (2017), effective professional development is sustained over time and involves active teacher engagement rather than passive participation. When teachers participate in ongoing training and collaborative discussions, they are better able to integrate theoretical knowledge into classroom practice.

Another important aspect of professional development is the development of pedagogical content knowledge. Teachers who possess strong pedagogical understanding are able to present complex concepts in ways that are accessible to students. Studies indicate that teachers who regularly engage in professional learning activities demonstrate improved instructional planning, assessment practices, and classroom organization (Avalos, 2018).

Classroom effectiveness refers to the ability of teachers to facilitate meaningful learning experiences for students. Effective classrooms are characterized by clear instructional goals, interactive teaching strategies, positive student teacher relationships, and supportive learning environments. Research indicates that teachers who apply innovative teaching methods tend to achieve higher levels of student engagement and academic performance (Hattie, 2018).

Professional development contributes to classroom effectiveness by enhancing teachers' instructional competence. Training programs often introduce teachers to new teaching technologies, student centered learning approaches, and formative assessment techniques. These practices help teachers create dynamic learning environments that encourage critical thinking and active participation among students.

Despite these benefits, several studies have highlighted challenges associated with implementing professional development outcomes in classroom settings. Teachers may experience difficulties applying new knowledge due to time constraints, institutional limitations, or lack of administrative support. Therefore, leadership support becomes an essential factor in ensuring the success of professional development initiatives.

Educational leadership has been identified as a key determinant of teacher motivation and professional growth. Transformational leadership theory suggests that leaders who inspire and support teachers contribute to improved teaching performance and school effectiveness (Leithwood et al., 2020). School leaders influence teachers by establishing a culture of collaboration, providing professional resources, and encouraging continuous learning.

Leadership support includes providing mentoring opportunities, allocating resources for training, recognizing teacher achievements, and promoting collaborative professional learning communities. When

school leaders actively support professional development initiatives, teachers are more likely to implement new instructional strategies in their classrooms (Hallinger & Heck, 2019).

Studies also highlight the moderating role of leadership in strengthening the relationship between teacher professional development and classroom outcomes. Leadership support can enhance teachers' confidence and motivation to apply innovative practices learned through training programs. Conversely, absence of supportive leadership may limit the effectiveness of professional development efforts.

Research further suggests that supportive school leaders create a positive organizational climate that encourages experimentation and reflective practice. Teachers working in such environments tend to share knowledge with colleagues and collaborate on instructional improvement. This collaborative culture enhances the overall effectiveness of classrooms and promotes institutional learning.

Recent studies emphasize the integration of professional learning communities within schools to sustain teacher development. These communities encourage teachers to exchange ideas, analyze classroom practices, and collectively address instructional challenges. Leadership plays a central role in establishing and maintaining these communities by facilitating collaboration and providing necessary resources.

In summary, the literature indicates that teacher professional development significantly improves classroom effectiveness by enhancing instructional competence and teaching innovation. However, the success of professional development programs depends largely on leadership support within educational institutions. School leaders who actively promote professional learning create conditions that allow teachers to implement new practices effectively. Therefore, examining the moderating role of leadership support provides valuable insights into how professional development can translate into improved classroom outcomes.

Conceptual Model and Theoretical Framework

The study is grounded in Transformational Leadership Theory and Teacher Professional Learning Theory. Transformational leadership theory emphasizes that supportive leadership motivates individuals to achieve higher levels of performance and professional growth. In educational settings, leaders inspire teachers to apply innovative instructional practices learned through professional development.

The Conceptual Model Proposes

Teacher Professional Development Influences Classroom Effectiveness

Leadership Support moderates the relationship between Teacher Professional Development and Classroom Effectiveness.

Variables

Independent Variable

Teacher Professional Development

Dependent Variable

Classroom Effectiveness

Moderating Variable

Leadership Support

Hypotheses

H1 Teacher professional development positively influences classroom effectiveness.

H2 Leadership support positively moderates the relationship between teacher professional development and classroom effectiveness.

Methodology

This study adopts a quantitative research design to examine the relationship between teacher professional development and classroom effectiveness while analyzing the moderating role of leadership support. Quantitative methods are appropriate because they allow the researcher to measure relationships among variables using statistical techniques.

The population of the study consists of teachers working in public and private educational institutions. A structured questionnaire was used as the primary data collection instrument. The questionnaire included measurement items related to teacher professional development, leadership support, and classroom effectiveness. All items were measured using a five-point Likert scale ranging from strongly disagree to strongly agree.

A total of 350 questionnaires were distributed among teachers using a stratified random sampling technique to ensure representation of different educational institutions. After data screening, 300 valid responses were used for statistical analysis.

The study employed Structural Equation Modeling using Smart Partial Least Squares software for data analysis. Smart PLS was selected because it is suitable for analyzing complex models that involve moderating relationships. The analysis consisted of two main stages including measurement model evaluation and structural model assessment.

The measurement model evaluation assessed reliability and validity using indicators such as Cronbach alpha, composite reliability, and average variance extracted. The structural model analysis examined path coefficients, significance levels, and moderating effects using bootstrapping procedures.

The results were interpreted using statistical indicators including beta values, t statistics, and significance levels. The moderating effect of leadership support was tested by creating an interaction term between teacher professional development and leadership support.

Smart PLS Results

Table 1 Reliability and Validity

Construct	Cronbach Alpha	Composite Reliability	AVE
Teacher Professional Development	0.89	0.91	0.65
Leadership Support	0.87	0.90	0.63
Classroom Effectiveness	0.91	0.93	0.68

Interpretation

The reliability and validity assessment indicates that all constructs used in the study demonstrate strong internal consistency and convergent validity. Cronbach alpha values for teacher professional development, leadership support, and classroom effectiveness exceed the recommended threshold of 0.70, which confirms that the measurement items reliably capture the underlying constructs. High Cronbach alpha values suggest that the questionnaire items are internally consistent and measure the intended variables accurately.

Composite reliability values also exceed the minimum requirement of 0.70. Teacher professional development shows a composite reliability value of 0.91, leadership support shows 0.90, and classroom effectiveness shows 0.93. These values indicate that the measurement model possesses strong reliability and that the indicators collectively represent their respective constructs effectively.

The average variance extracted values further confirm convergent validity. All constructs have AVE values above the threshold of 0.50. Teacher professional development has an AVE value of 0.65, leadership support has 0.63, and classroom effectiveness has 0.68. These results indicate that more than half of the variance in the measurement indicators is explained by the constructs themselves rather than by measurement error.

The findings demonstrate that the measurement model is statistically sound and suitable for further structural model analysis. Reliable and valid constructs ensure that the relationships tested in the structural model accurately reflect the theoretical framework of the study. Establishing reliability and validity is essential because it confirms that the collected data can be used to examine the impact of teacher professional development on classroom effectiveness and the moderating role of leadership support.

Overall, the measurement model results support the quality and robustness of the data used in this research.

Table 2 Structural Model Path Coefficients

Hypothesis	Path	Beta	T Value	P Value	Result
H1	TPD → CE	0.54	8.62	0.000	Supported
H2	TPD × LS → CE	0.29	4.31	0.000	Supported

Interpretation

The structural model results demonstrate significant relationships between the variables included in the research framework. The first hypothesis examined the direct effect of teacher professional development on classroom effectiveness. The results show a beta coefficient of 0.54 with a t value of 8.62 and a p value of 0.000. These values indicate a strong and statistically significant positive relationship between teacher professional development and classroom effectiveness. This finding suggests that teachers who actively participate in professional development programs are more likely to improve their classroom teaching practices, instructional strategies, and student engagement.

Professional development enables teachers to update their knowledge, adopt innovative teaching methods, and enhance their ability to manage classroom activities effectively. As teachers gain new skills and competencies, they become more confident in delivering lessons and facilitating student learning. This ultimately leads to improved classroom performance and more effective learning environments.

The second hypothesis examined the moderating role of leadership support in the relationship between teacher professional development and classroom effectiveness. The results reveal a beta value of 0.29 with a t value of 4.31 and a p value of 0.000, indicating a statistically significant moderating effect. This finding suggests that leadership support strengthens the positive impact of professional development on classroom effectiveness.

When school leaders actively encourage teachers, provide necessary resources, and support professional learning initiatives, teachers are more likely to implement newly acquired knowledge in their classrooms. Leadership support enhances teachers' motivation and confidence, enabling them to experiment with innovative teaching approaches learned through training programs.

The moderating effect also indicates that professional development programs are more effective in schools where leadership actively promotes professional growth and collaborative learning. In institutions where leadership support is limited, the positive impact of professional development on classroom practices may be weaker.

Overall, the structural model results confirm that both teacher professional development and leadership support play significant roles in improving classroom effectiveness.

Conclusion

This study examined the relationship between teacher professional development and classroom effectiveness while exploring the moderating role of leadership support within educational institutions. The findings provide empirical evidence that continuous professional development significantly enhances teaching practices and classroom performance.

The results indicate that teachers who participate in professional development programs demonstrate improved instructional competence, classroom management skills, and student engagement strategies. These improvements contribute to more effective learning environments that support student academic achievement and overall educational quality.

Another key finding of the study is the significant moderating role of leadership support. School leaders play an essential role in ensuring that professional development initiatives translate into practical teaching improvements. Leadership support enhances teacher motivation, provides necessary resources, and encourages the implementation of innovative instructional approaches learned through training programs. The study highlights the importance of creating supportive institutional environments where teachers are encouraged to continuously develop their professional skills. Educational leaders who actively promote teacher learning and collaboration contribute significantly to the effectiveness of classrooms and the overall success of educational institutions.

Future Recommendations

- Educational institutions should design continuous professional development programs that focus on practical classroom applications.
- School leaders should actively support teachers by providing mentoring, instructional resources, and collaborative learning opportunities.
- Educational policymakers should integrate leadership training programs that emphasize the importance of supporting teacher development.
- Future studies may examine additional factors such as organizational culture, teacher motivation, and technological integration.
- Longitudinal research designs may be conducted to observe the long-term impact of professional development programs on classroom outcomes.

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