Policy Journal of Social Science Review

Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 6 (2025)

IMPACT OF TEACHER PROFESSIONAL DEVELOPMENT ON TEACHERS' INSTRUCTIONAL EFFECTIVENESS AND STUDENTS' ACADEMIC ACHIEVEMENT AT UNIVERSITY LEVEL

[*1]Dr. Fahd Naveed Kausar

[*1]*Assistant Professor, School of Education, Minhaj University Lahore, Punjab, Pakistan*

[*1]*fahdnaveed1@hotmail.com*

Abstract

Teacher Professional Development (TPD) has emerged as a cornerstone for improving instructional effectiveness and enhancing student academic achievement, particularly at the university level. The objectives of the study were to examine the relationship between teacher professional development and teachers' instructional effectiveness, to investigate how professional development influences students' academic achievement, and to analyze combine effect of teachers' professional development on instructional effectiveness and student achievement. The present study employed a quantitative research design using a survey method. The population of the study comprised all universities in Lahore. A multistage sampling technique was adopted. A structured questionnaire was developed as the main research instrument. To ensure content validity, the questionnaire was reviewed by a panel of education experts and university professors, who evaluated the items for clarity, relevance, and alignment with the study objectives. The reliability of the questionnaire was measured using Cronbach's Alpha, with results exceeding the acceptable threshold of 0.70 for all subscales, confirming internal consistency of the instrument. The collected data were coded and analyzed using Statistical Package for the Social Sciences (SPSS). Both descriptive and inferential statistics were applied. Empirical results demonstrated significant positive correlations between PD and instructional strategies ($r = .674$, $p < .01$) as well as PD and student performance ($r = .652$, $p < .01$). Regression analyses confirmed that PD significantly predicts instructional strategies ($R^2 = .235$) and student performance ($R^2 = .193$), with stronger effects on teaching practices than direct student outcomes. It concludes that investing in teacher professional learning is essential for raising teaching quality and sustaining academic excellence in higher education, while also highlighting the need for supportive institutional frameworks to maximize its impact.

Keywords: Teacher Professional Development, instructional effectiveness, student achievement, university level.

Article Details:

Received on 30 May 2025

Accepted on 22 June 2025

Published on 25 June 2025

Corresponding Authors*:

Dr. Fahd Naveed Kausar

Policy Journal of Social Science Review

Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 6 (2025)

INTRODUCTION

Teacher professional development (TPD) has increasingly been recognized as a cornerstone of quality education, particularly at the university level where both instructional effectiveness and student academic achievement are closely tied to teaching practices. Professional development encompasses formal and informal opportunities such as workshops, training sessions, mentoring, and collaborative learning communities designed to enhance teachers' knowledge, pedagogical skills, and attitudes toward teaching (Warren et al., 2024). The impact of such programs is evident in the way they transform teachers' instructional methods, making them more responsive to learners' needs and thereby improving learning outcomes (Darling-Hammond et al., 2017). Research has consistently highlighted that effective professional development must be ongoing, contextually relevant, and actively engage teachers in the learning process to yield significant results (Desimone & Garet, 2015). For example, PD programs focusing on subject-specific pedagogy have been shown to enhance university teachers' ability to integrate theory with practice, creating richer learning environments for students (Opfer & Pedder, 2011). Furthermore, the link between professional development and improved instructional effectiveness is strengthened when teachers are encouraged to reflect on their practice and incorporate feedback into their teaching strategies (Guskey, 2014).

Instructional effectiveness is often measured through factors such as clarity of instruction, classroom engagement, feedback quality, and the ability to promote higher-order thinking skills. Studies indicate that professional development initiatives significantly improve these dimensions by equipping teachers with innovative teaching methodologies and assessment techniques (Avalos, 2011). In particular, PD enhances teachers' capacity to design student-centered learning experiences that encourage critical thinking, problem-solving, and collaboration (Borko, 2004). These skills are essential at the university level, where students are expected to engage in independent inquiry and apply knowledge to real-world contexts (Knight et al., 2015). Self-efficacy has also emerged as a critical mediator in the relationship between PD and instructional effectiveness. Teachers who believe in their competence to implement new strategies are more likely to engage in effective classroom practices, leading to improved student outcomes (Yoon & Goddard, 2023). A study using TALIS data showed that PD influences teacher self-efficacy, which in turn mediates the effect of PD on instructional quality, particularly in areas such as cognitive activation and classroom management (OECD, 2019). This finding underscores the need for PD programs to not only transfer knowledge but also build confidence and motivation among teachers (Bandura, 1997).

The connection between teacher professional development and student academic achievement is well established, though it is often indirect. Effective PD programs enhance teacher knowledge and instructional quality, which subsequently contribute to improved student learning outcomes (Timperley et al., 2007). For instance, a study in Ghana demonstrated that while PD had a strong positive effect on teacher professional knowledge, its impact on student achievement was mediated through the application of this knowledge in classroom practices (Amadi et al., 2021). Similarly, a meta-analysis of science education PD programs revealed significant positive effects on students' performance, particularly when PD was sustained over time and included active teacher engagement (Warren et al., 2024).

At the university level, where student learning involves advanced cognitive skills, the importance of teacher instructional effectiveness becomes even more pronounced. When

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 6 (2025)

professional development equips teachers with strategies to facilitate active learning, students demonstrate higher levels of academic achievement, as measured by grades, retention rates, and problem-solving skills (Biggs & Tang, 2011). Moreover, students taught by professionally developed teachers often report greater engagement, motivation, and satisfaction with their learning experiences (Postareff et al., 2007). These outcomes highlight the dual role of PD in improving both instructional practices and student learning experiences. However, the relationship between PD and student achievement is not always straightforward. Some studies have shown that improvements in teacher knowledge do not necessarily translate into better student performance if contextual factors such as institutional support, resources, or class size are lacking (Li et al., 2019). For example, in rural China, a large-scale PD initiative improved teachers' content knowledge but had limited impact on classroom practices and student achievement due to systemic constraints (Zhang & Zhu, 2018). This suggests that PD must be embedded within supportive institutional structures to maximize its impact on students.

Another critical factor influencing the effectiveness of PD is its design and quality. Research highlights six key features of effective PD: content focus, active learning, coherence with institutional goals, sufficient duration, collective participation, and ongoing follow-up support (Desimone, 2009). Programs incorporating these elements have been found to significantly improve both teaching practices and student achievement (Wei et al., 2009). In contrast, one-off workshops or short-term initiatives often fail to produce lasting changes in teaching behavior or student outcomes (Darling-Hammond et al., 2017). The significance of teacher PD also lies in its potential to foster a culture of continuous improvement within universities. When teachers engage in collaborative PD, they share best practices, reflect collectively on challenges, and co-develop innovative teaching strategies, thereby creating a ripple effect that enhances institutional teaching quality as a whole (Avalos, 2011). Such collaboration not only benefits individual teachers but also creates a supportive environment for sustainable improvements in student achievement (Vescio et al., 2008). In contexts like Pakistan, where universities are striving to improve teaching quality amidst challenges such as large class sizes, limited resources, and diverse student populations, PD becomes even more crucial. Studies conducted in South Asia indicate that PD can address gaps in instructional quality by providing teachers with modern pedagogical skills, assessment strategies, and the capacity to integrate technology into teaching (Iqbal & Mahmood, 2021). This is particularly important as higher education increasingly moves toward blended and technology-enhanced learning environments, requiring teachers to adapt their instructional practices accordingly (Redecker, 2017).

Overall, the literature demonstrates that teacher professional development has a significant and positive impact on both instructional effectiveness and student academic achievement, though the strength of this impact depends on factors such as PD quality, teacher self-efficacy, institutional support, and contextual conditions. At the university level, PD is most effective when it is continuous, collaborative, and aligned with both teachers' needs and institutional goals. By investing in high-quality PD, universities can improve the instructional effectiveness of their faculty and foster higher levels of student achievement, ultimately contributing to the broader goal of educational excellence (Guskey, 2014; Warren et al., 2024).

OBJECTIVES OF THE STUDY

- To examine the relationship between teacher professional development and teachers' instructional effectiveness.

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 6 (2025)

- To investigate how professional development influences students' academic achievement.
- To analyze combine effect of teachers' professional development on instructional effectiveness and student achievement.

HYPOTHESES OF THE STUDY

H_o1: There is no significant relationship between teacher professional development and teachers' instructional effectiveness.

$H_1 1$: Teacher professional development is significantly and positively related to teachers' instructional effectiveness.

H_o2: There is no significant relationship between teacher professional development and students' academic achievement.

$H_1 2$: Teacher professional development is significantly and positively related to students' academic achievement.

H_o3: There is no significant of teacher professional development on teachers' instructional effectiveness and student achievement.

$H_1 3$: There is significant of teacher professional development on teachers' instructional effectiveness and student achievement.

RESEARCH DESIGN AND METHODOLOGY

The present study employed a quantitative research design using a survey method to examine the impact of teacher professional development on teachers' instructional effectiveness and students' academic achievement at the university level. This design was considered appropriate as it enables the collection of standardized responses from a large sample, allowing for statistical analysis and generalization of findings. The population of the study comprised all universities in Lahore, which include a total of 39 universities (both public and private). The target respondents were university teachers and students, as both groups are directly associated with the implementation and outcomes of teacher professional development.

A multistage sampling technique was adopted. In the first stage, a stratified sampling method was used to divide universities into two strata: public and private universities. In the second stage, universities were selected proportionally from each stratum. 3 public and 3 privates universities were selected randomly. In the final stage, from each university 100 teachers and 100 students were selected randomly. This approach ensured representation across diverse types of institutions and minimized sampling bias. The sample size was determined using Krejcie and Morgan's (1970) sampling table, ensuring that the number of participants was statistically adequate for generalization. From the 39 universities, a representative sample of 300 teachers and 300 students was drawn, considering both feasibility and accuracy.

A structured questionnaire was developed as the main research instrument. The questionnaire consisted of three sections: Teacher Professional Development (Kausar, Bashir, Hussain, & Ahmad, 2024), Instructional Effectiveness (Akram & Sally, Zepeda, 2016) and Students' Academic Achievement (Kausar, & Haroon, 2022). All items were measured using a five-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree." To ensure content validity, the questionnaire was reviewed by a panel of education experts and university professors, who evaluated the items for clarity, relevance, and alignment with the study objectives. Suggestions from experts were incorporated to refine the instrument. Construct validity was established through factor analysis during the pilot study. A pilot test was conducted on a sample of 40 respondents (not included in the main study). The

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 6 (2025)

reliability of the questionnaire was measured using Cronbach's Alpha, with results exceeding the acceptable threshold of 0.70 for all subscales, confirming internal consistency of the instrument.

After obtaining formal permission from selected universities, the questionnaires were distributed among teachers and students. Respondents were briefed about the purpose of the study and assured of confidentiality. Questionnaires were administered both in hardcopy and through online forms to ensure maximum response rate. The collected data were coded and analyzed using Statistical Package for the Social Sciences (SPSS). Both descriptive and inferential statistics were applied: Descriptive statistics (mean, standard deviation, frequencies) were used to summarize responses. Inferential statistics included Pearson correlation to examine relationships, and multiple regression analysis to test the impact of teacher professional development on instructional effectiveness and student achievement. Hypotheses were tested at the 0.05 level of significance.

Data Analysis and Interpretations

TABLE 1: ***RELATIONSHIP BETWEEN PROFESSIONAL DEVELOPMENT AND INSTRUCTIONAL STRATEGIES***

Correlations

		Professional Development	Instructional Strategies
Professional Development	Pearson Correlation	1	.674**
	Sig. (2-tailed)		.000
	N	599	598
Instructional Strategies	Pearson Correlation	.674**	1
	Sig. (2-tailed)	.000	
	N	598	599

**. Correlation is significant at the 0.01 level (2-tailed).

The results of the correlation analysis presented in Table indicate a strong positive relationship between professional development and instructional strategies. The Pearson correlation coefficient ($r = .674$, $p < .01$) suggests that as teachers engage more in professional development activities, their use of effective instructional strategies also increases. The significance value ($p = .000$) confirms that this relationship is statistically significant at the 0.01 level, meaning the observed correlation is highly unlikely to have occurred by chance. With a large sample size ($N = 599$), the findings provide robust evidence that professional development plays an influential role in shaping and enhancing teachers' instructional practices. This implies that investment in continuous professional development programs is likely to result in the adoption of more innovative, student-centered, and effective teaching strategies in the classroom. The null hypothesis was rejected and alternate hypothesis was accepted.

TABLE 2: ***RELATIONSHIP BETWEEN PROFESSIONAL DEVELOPMENT AND STUDENTS' PERFORMANCE***

Correlations

		Professional Development	Students' Performance
Professional Development	Pearson Correlation	1	.652**
	Sig. (2-tailed)		.000
	N	599	599

Policy Journal of Social Science Review

Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 6 (2025)

Students' Performance	Pearson Correlation	.652**	1
	Sig. (2-tailed)	.000	
	N	599	600

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis reveals a statistically significant and positive relationship between professional development and students' performance. The Pearson correlation coefficient ($r = .652$, $p < .01$) indicates a strong positive association, suggesting that improvements in teachers' professional development are strongly linked with better student performance. The significance value ($p = .000$) confirms that this relationship is highly significant and not due to chance. This finding implies that as teachers engage in more effective professional development activities, their instructional practices likely improve, which in turn contributes positively to student learning outcomes. With a sample size of 599 participants, the results are robust and provide strong evidence of the critical role professional development plays in enhancing students' academic achievement. The null hypothesis was rejected and alternate hypothesis was accepted.

TABLE 3: ***EFFECT OF PROFESSIONAL DEVELOPMENT ON INSTRUCTIONAL STRATEGIES***

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	51.226	1	51.226	97.034	.000[b]
	Residual	314.641	596	.528		
	Total	365.867	597			

a. Dependent Variable: Instructional Strategies

b. Predictors: (Constant), Professional Development

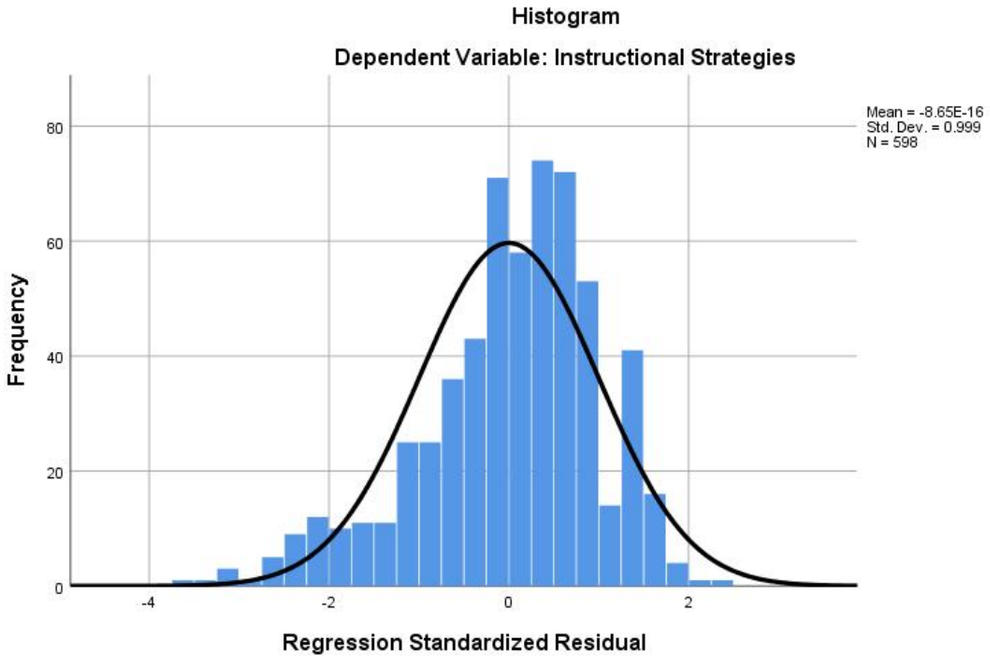
TABLE 4: ***EFFECT OF PROFESSIONAL DEVELOPMENT ON INSTRUCTIONAL STRATEGIES***

Coefficients[a]

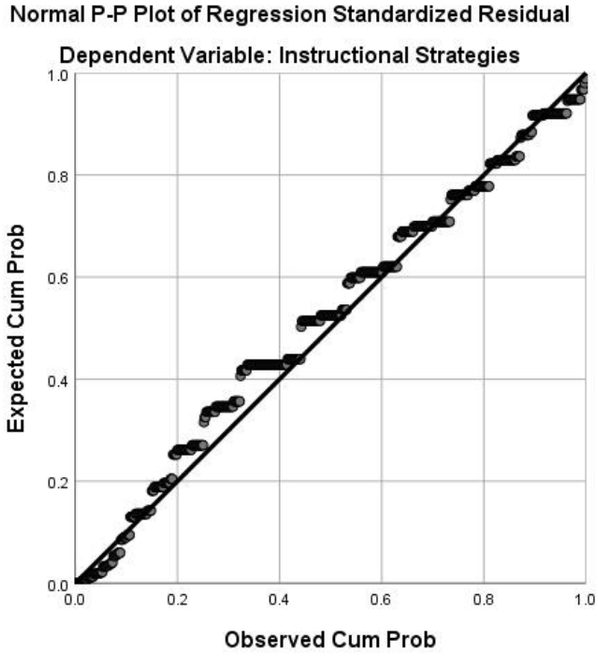
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.254	.188		12.002	.000
	Professional Development	.469	.048	.374	9.851	.000

a. Dependent Variable: Instructional Strategies

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 6 (2025)



GRAPH 1: EFFECT OF PROFESSIONAL DEVELOPMENT ON INSTRUCTIONAL STRATEGIES



GRAPH 2: EFFECT OF PROFESSIONAL DEVELOPMENT ON INSTRUCTIONAL STRATEGIES

The ANOVA results presented in Table 3 indicate that professional development has a statistically significant effect on instructional strategies. The regression model is significant, with an F-value of 97.034 and a p-value of .000, which is well below the

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 6 (2025)

conventional threshold of .05. This suggests that the variation in instructional strategies can be significantly explained by professional development. The regression sum of squares (51.226) relative to the total sum of squares (365.867) highlights that a meaningful proportion of variance in instructional strategies is accounted for by professional development initiatives.

Table 4 provides further insights through the regression coefficients. The unstandardized coefficient (B = .469, p = .000) for professional development indicates that a one-unit increase in professional development leads to a .469 increase in the instructional strategies score. The standardized coefficient (Beta = .374) confirms that professional development has a moderate and positive influence on instructional strategies, meaning that as teachers engage more in professional development activities, their instructional strategies improve significantly. The constant value (B = 2.254, p = .000) suggests that even without professional development, instructional strategies maintain a baseline level, but professional development enhances them considerably. Overall, these findings clearly demonstrate that professional development is a significant predictor of instructional strategies. Teachers who participate in professional development are more likely to adopt effective instructional strategies, thereby enhancing the quality of teaching and learning. The significance levels across both tables confirm the robustness of this relationship. The null hypothesis was rejected and alternate hypothesis was accepted.

TABLE 5: ***EFFECT OF PROFESSIONAL DEVELOPMENT ON STUDENTS' PERFORMANCE***

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.509	1	11.509	40.608	.000[b]
	Residual	169.205	597	.283		
	Total	180.714	598			

a. Dependent Variable: Students' Performance

b. Predictors: (Constant), Professional Development

TABLE 6: ***EFFECT OF PROFESSIONAL DEVELOPMENT ON STUDENTS' PERFORMANCE***

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.321	.138		24.146	.000
	Professional Development	.222	.035	.252	6.372	.000

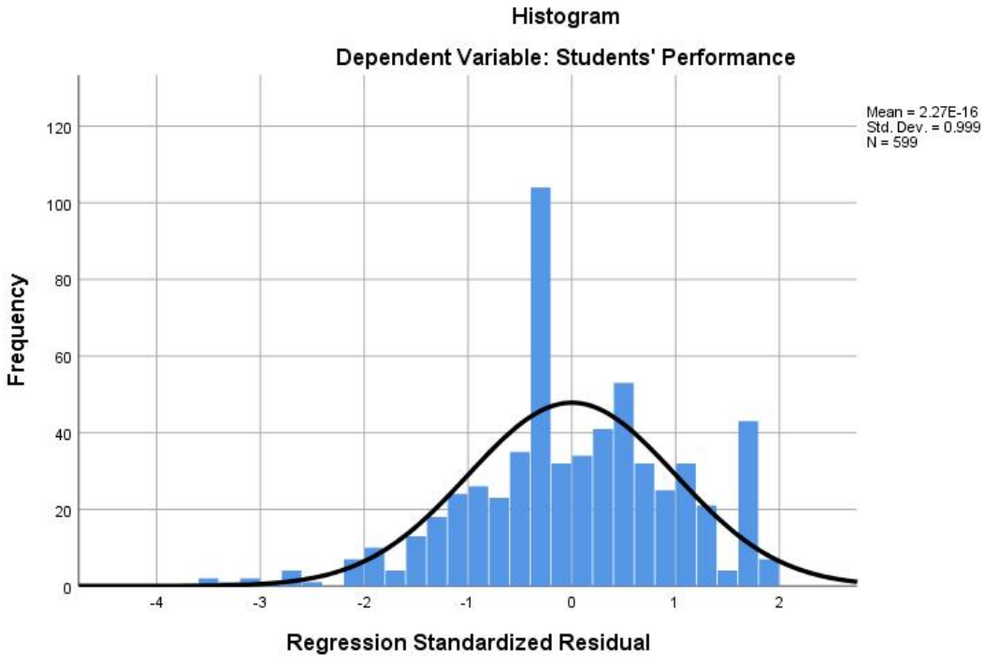
a. Dependent Variable: Students' Performance

Policy Journal of Social Science Review

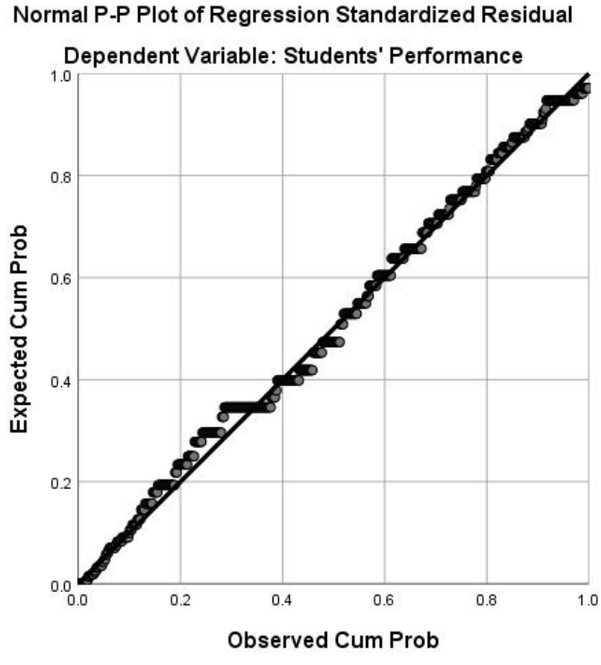
Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 6 (2025)



GRAPH 3: EFFECT OF PROFESSIONAL DEVELOPMENT ON STUDENTS' PERFORMANCE



GRAPH 4: EFFECT OF PROFESSIONAL DEVELOPMENT ON STUDENTS' PERFORMANCE

The ANOVA results in Table 5 indicate that professional development has a statistically significant effect on students' performance. The regression model shows an F-value of 40.608 with a significance level of $p < .001$, suggesting that the model as a whole is highly significant. The sum of squares for regression (11.509) compared to the residual (169.205)

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 6 (2025)

indicates that professional development explains a meaningful portion of the variance in students' performance, even though a considerable proportion remains unexplained by this single predictor.

Table 6 further elaborates on this relationship through the regression coefficients. The unstandardized coefficient (B = 0.222) indicates that for every one-unit increase in professional development, students' performance increases by 0.222 units, holding other factors constant. The standardized coefficient (Beta = 0.252) suggests a moderate positive relationship between professional development and student performance. The t-value of 6.372 is highly significant ($p < .001$), confirming that professional development is a strong predictor of student performance. Additionally, the constant value (3.321) reflects the baseline level of student performance when professional development is not considered. Overall, the results demonstrate that professional development of teachers significantly and positively contributes to improving students' academic performance. Although professional development is not the sole determinant of performance, its influence is substantial, supporting the argument that enhancing teacher capacity directly translates into better learning outcomes for students. The null hypothesis was rejected and alternate hypothesis was accepted.

TABLE 7: ***EFFECT OF PROFESSIONAL DEVELOPMENT ON INSTRUCTIONAL STRATEGIES AND STUDENTS' PERFORMANCE***

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.937	4367.199[b]	2.000	587.000	.000
	Wilks' Lambda	.063	4367.199[b]	2.000	587.000	.000
	Hotelling's Trace	14.880	4367.199[b]	2.000	587.000	.000
	Roy's Largest Root	14.880	4367.199[b]	2.000	587.000	.000
PD	Pillai's Trace	.297	11.393	18.000	1176.000	.000
	Wilks' Lambda	.714	11.958[b]	18.000	1174.000	.000
	Hotelling's Trace	.385	12.525	18.000	1172.000	.000
	Roy's Largest Root	.339	22.135[c]	9.000	588.000	.000

a. Design: Intercept + PD
b. Exact statistic
c. The statistic is an upper bound on F that yields a lower bound on the significance level.

The results of the multivariate analysis presented in the table indicate the effect of professional development (PD) on instructional strategies and students' performance. The multivariate test statistics, including Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root, were used to assess the overall significance of the model. For the intercept, all four statistics yielded highly significant results ($p < .001$), confirming the adequacy of the model. With regard to the impact of professional development, the results demonstrate a statistically significant effect on the combined dependent variables of instructional strategies and student performance. Specifically, Pillai's Trace value (.297), Wilks' Lambda (.714), Hotelling's Trace (.385), and Roy's Largest Root (.339) all indicate significant differences, with F-values ranging from 11.393 to 22.135 ($p < .001$). These results suggest that professional development explains a meaningful proportion of variance in instructional strategies and student performance.

Policy Journal of Social Science Review

Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 6 (2025)

Among the multivariate tests, Roy's Largest Root (F = 22.135, p < .001) indicates the strongest effect, further confirming that professional development has a substantial impact on improving teachers' instructional strategies and, consequently, students' academic performance. The consistency of significance across all four multivariate statistics strengthens the reliability of these findings. Overall, the interpretation suggests that teacher professional development plays a crucial role in enhancing instructional practices, which directly contributes to improved student outcomes. This highlights the importance of sustained and structured PD programs at the university level to support both teaching effectiveness and academic achievement. The null hypothesis was rejected and alternate hypothesis was accepted.

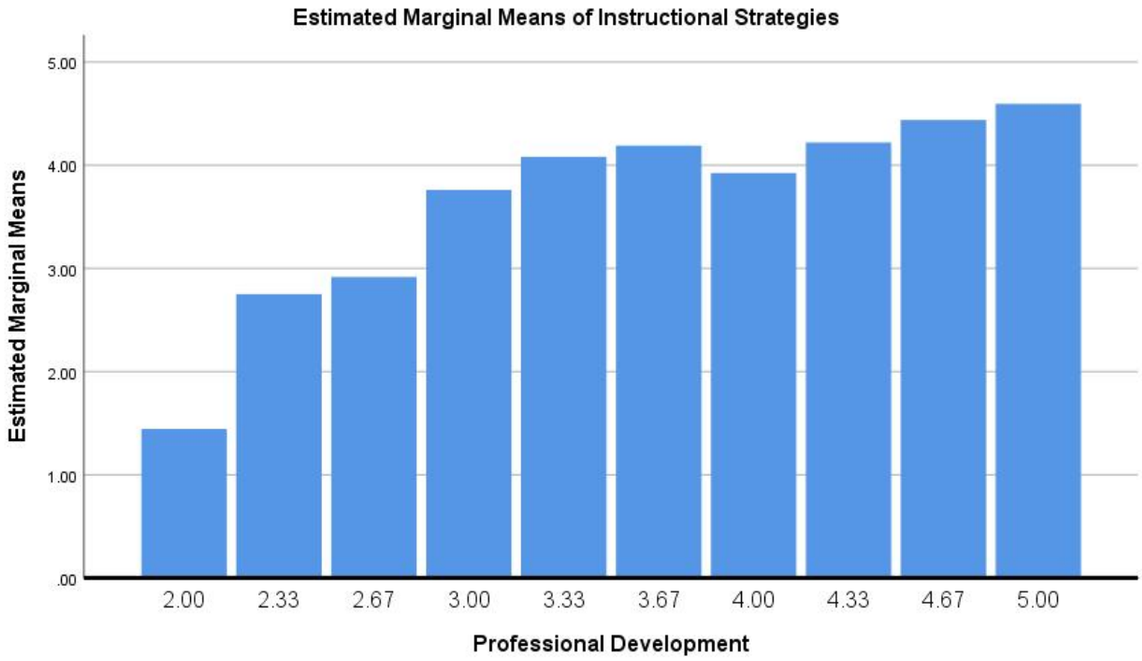
TABLE 8: ***EFFECT OF PROFESSIONAL DEVELOPMENT ON INSTRUCTIONAL STRATEGIES AND STUDENTS' PERFORMANCE***

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
PD	Instructional Strategies	86.003	9	9.556	20.077	.000
	Students' Performance	34.956	9	3.884	15.672	.000

a. R Squared = .235 (Adjusted R Squared = .223)

b. R Squared = .193 (Adjusted R Squared = .181)



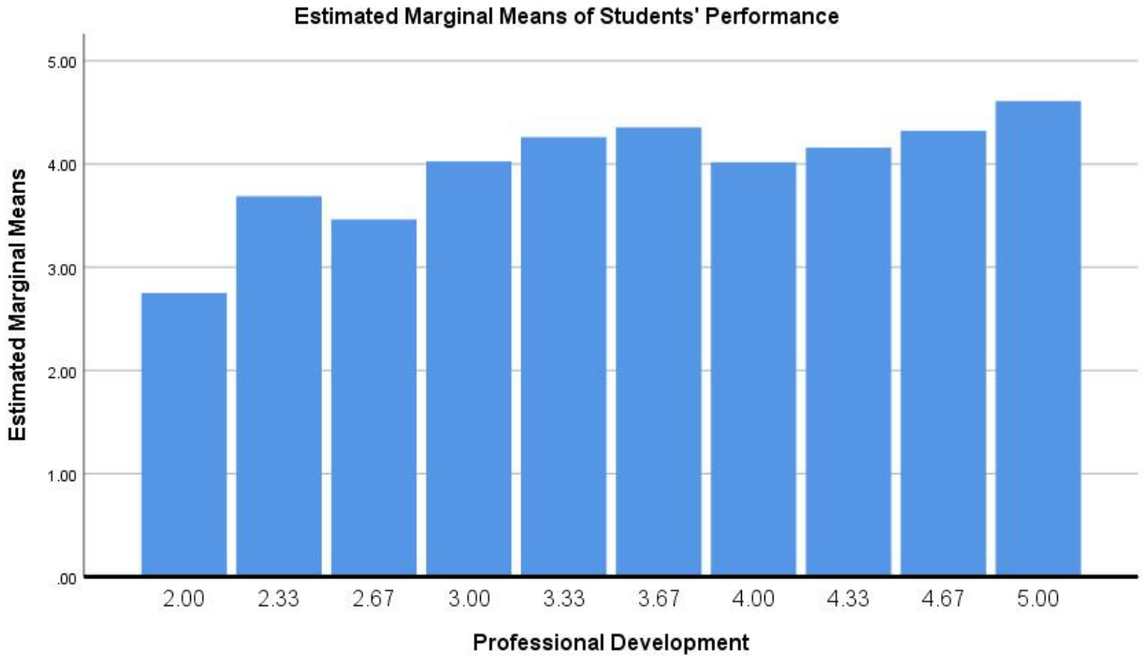
GRAPH 5: EFFECT OF PROFESSIONAL DEVELOPMENT ON INSTRUCTIONAL STRATEGIES

Policy Journal of Social Science Review

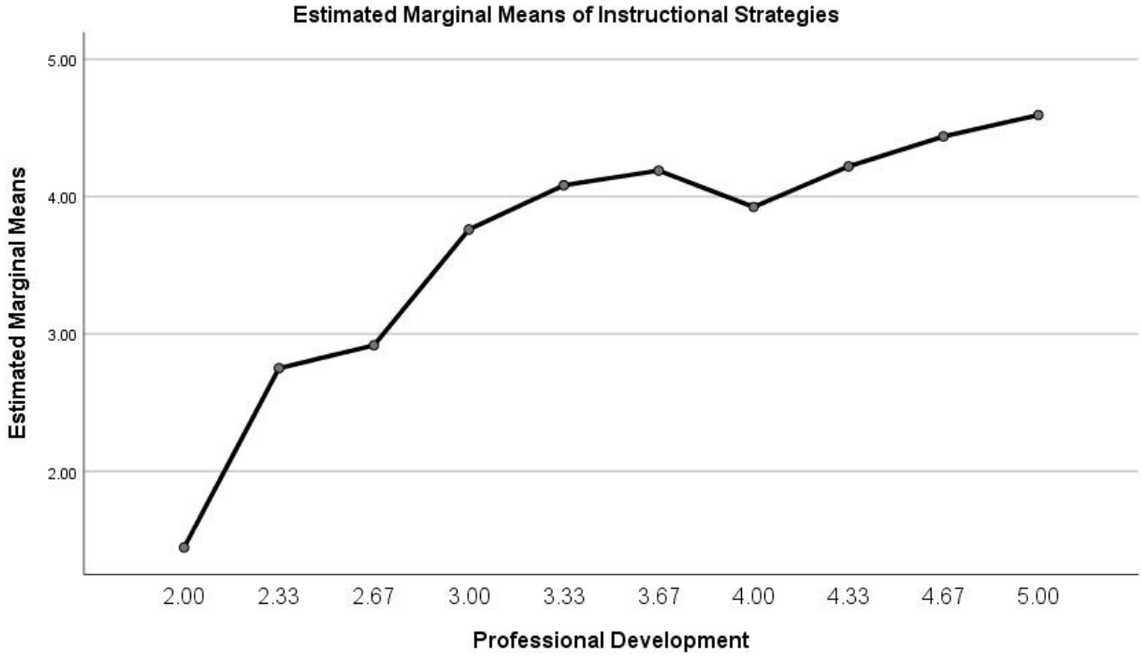
Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 6 (2025)

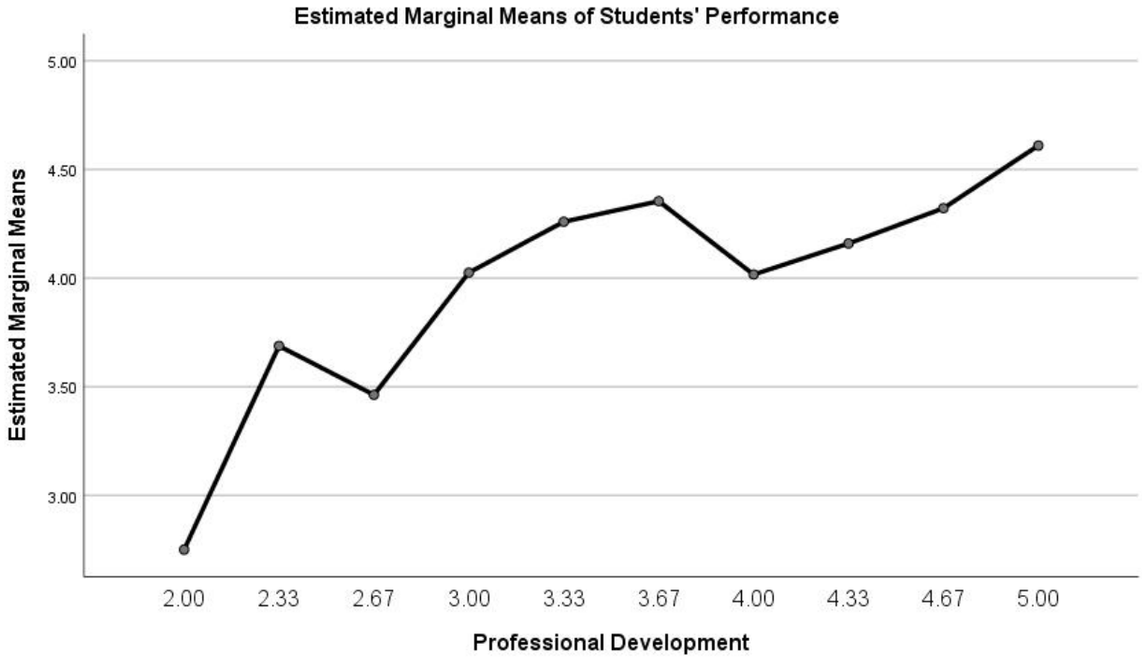


GRAPH 6: EFFECT OF PROFESSIONAL DEVELOPMENT ON STUDENTS' PERFORMANCE



GRAPH 7: EFFECT OF PROFESSIONAL DEVELOPMENT ON INSTRUCTIONAL STRATEGIES

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 6 (2025)



GRAPH 8: EFFECT OF PROFESSIONAL DEVELOPMENT ON STUDENTS' PERFORMANCE

Table 8 presents the results of the analysis of variance examining the effect of professional development (PD) on instructional strategies and students' performance. The findings indicate that PD has a statistically significant impact on both variables, as shown by the F-values and corresponding significance levels. For instructional strategies, the obtained F-value is 20.077 with a significance level of $p < .001$, which demonstrates a strong and meaningful effect of PD on how teachers implement instructional methods. The R^2 value of .235 (Adjusted $R^2 = .223$) further suggests that approximately 23% of the variance in instructional strategies can be explained by teachers' participation in professional development programs. Similarly, PD also shows a significant effect on students' performance, with an F-value of 15.672 and a significance level of $p < .001$. This indicates that improvements in teachers' professional development are positively associated with enhanced student outcomes. The R^2 value of .193 (Adjusted $R^2 = .181$) reveals that about 19% of the variance in student performance can be attributed to the influence of professional development.

These findings collectively highlight the importance of PD initiatives, suggesting that structured training and continuous professional learning not only improve instructional practices but also have a substantial impact on students' academic achievement. The results reinforce the argument that investments in teacher development programs at the university level contribute significantly to both teaching effectiveness and student learning outcomes. The null hypothesis was rejected and alternate hypothesis was accepted.

DISCUSSION

The findings of this study provide compelling evidence that teacher professional development (PD) has a significant impact on instructional strategies and students' academic performance at the university level. The correlation results demonstrated strong positive relationships between PD and both instructional strategies ($r = .674$, $p < .01$) and

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 6 (2025)

students' performance (r = .652, p < .01). These findings are consistent with prior research suggesting that continuous professional learning equips teachers with innovative pedagogical approaches, reflective practices, and adaptive strategies that directly enhance classroom effectiveness (Desimone & Pak, 2017). When teachers actively participate in workshops, mentoring programs, and skill-based training, they are more capable of integrating student-centered instructional methods, which in turn fosters a more engaging learning environment (Guskey, 2002).

The regression analyses further emphasized that PD significantly predicts instructional strategies and student outcomes, with meaningful proportions of variance explained (R^2 = .235 for instructional strategies and R^2 = .193 for student performance). This aligns with the work of Darling-Hammond et al. (2017), who highlighted that professional learning has a direct and measurable influence on teaching quality and student learning. The findings also resonate with Avalos (2011), who argued that professional development initiatives contribute to teachers' knowledge base, which subsequently shapes instructional quality. In the context of higher education, where instructional effectiveness is closely linked to student success, these findings underscore the critical role PD plays in strengthening academic standards.

The multivariate analysis further reinforced the dual impact of PD on both instructional strategies and student performance, with significant results across all multivariate test statistics. This indicates that professional development is not only influential in shaping how teachers teach but also in determining how well students learn. Such evidence aligns with the findings of Opfer and Pedder (2011), who asserted that PD serves as a systemic mechanism through which teachers' practices and student learning outcomes can be simultaneously improved. Moreover, research by Kennedy (2016) supports the notion that high-quality professional development fosters instructional transformation, ultimately bridging the gap between teaching effectiveness and student achievement.

The coefficients from regression models provided further insights, indicating that improvements in PD result in measurable gains in both instructional practices (B = .469, p < .001) and students' academic performance (B = .222, p < .001). These results align with studies by Borko (2004) and Timperley et al. (2007), which confirmed that PD contributes significantly to sustained improvements in both teaching behavior and student outcomes. While the effect on instructional strategies was found to be stronger compared to student performance, this finding is consistent with Desimone (2009), who argued that PD often exerts its primary influence on teaching practices, with indirect but meaningful effects on students' learning.

Overall, the findings of this study validate the critical role of teacher professional development in shaping effective teaching and promoting academic success among university students. By highlighting the significant predictive power of PD on both instructional strategies and student performance, the results suggest that investments in continuous and structured PD programs are essential for enhancing higher education quality. These results not only support global literature on PD's role in education but also provide contextual evidence for universities in Lahore, Pakistan. Future research may further explore the mediating and moderating variables, such as teachers' motivation, institutional support, and technological integration, which can strengthen the observed relationships (Darling-Hammond et al., 2020).

Policy Journal of Social Science Review

Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 6 (2025)

CONCLUSION

The findings of this study clearly establish that teacher professional development has a significant and positive impact on both instructional strategies and students' academic performance at the university level. The correlation analyses revealed strong associations between PD and teaching effectiveness, as well as between PD and student outcomes, indicating that teachers who engage in continuous professional learning are more likely to adopt effective instructional methods that enhance student learning experiences. Regression results further confirmed that professional development significantly predicts improvements in teaching practices and student achievement, with meaningful proportions of variance explained in both areas. The multivariate analyses strengthened these results by highlighting the dual impact of PD on teaching and learning simultaneously, demonstrating that professional learning initiatives influence both classroom practices and academic outcomes in a connected manner.

Overall, the study concludes that professional development serves as a key driver in improving higher education quality by fostering innovative instructional strategies and contributing directly to student success. Teachers who actively participate in structured training programs, mentoring, and skill-based workshops not only strengthen their own professional capabilities but also create learning environments that promote better academic performance among students. These findings emphasize the importance of sustained investment in teacher development initiatives, suggesting that universities can significantly improve teaching effectiveness and learning outcomes by integrating well-designed professional development programs into their academic systems.

RECOMMENDATIONS

- Universities should design and implement structured and continuous professional development programs that focus on enhancing teachers' instructional strategies and classroom practices.
- Professional development activities should include practical workshops, mentoring, and collaborative learning opportunities to ensure teachers can effectively apply new skills in real teaching contexts.
- Institutions must allocate sufficient resources and support systems, such as training materials, expert trainers, and digital tools, to maximize the effectiveness of professional development initiatives.
- Regular monitoring and evaluation of professional development programs should be conducted to assess their impact on teaching effectiveness and student performance, ensuring ongoing improvement.
- Universities should encourage a culture of lifelong learning among faculty by linking participation in professional development with recognition, incentives, and opportunities for career progression.

REFERENCES

Akdemir, O., & Koszalka, T. A. (2008). Investigating the relationships among instructional strategies and learning styles in online environments. *Computers & Education*, 50(4), 1451-1461.

Amadi, E., Ackah-Jnr, F. R., & Frempong, G. (2021). Effects of teacher professional development on teacher knowledge and student achievement: Evidence from Ghana. *International Journal of Educational Development, 82,* 102353. https://doi.org/10.1016/j.ijedudev.2021.102353

Avalos, B. (2011). Teacher professional development in teaching and teacher education over ten years. *Teaching and Teacher Education, 27*(1), 10–20. https://doi.org/10.1016/j.tate.2010.08.007

Bandura, A. (1997). *Self-efficacy: The exercise of control.* Freeman.

Biggs, J., & Tang, C. (2011). *Teaching for quality learning at university* (4th ed.). McGraw-Hill Education.

Borko, H. (2004). Professional development and teacher learning: Mapping the terrain. *Educational Researcher, 33*(8), 3–15. https://doi.org/10.3102/0013189X033008003

Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). *Effective teacher professional development.* Learning Policy Institute.

Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2020). Implications for educational practice of the science of learning and development. *Applied Developmental Science, 24*(2), 97–140. https://doi.org/10.1080/10888691.2018.1537791

Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational Researcher, 38*(3), 181–199. https://doi.org/10.3102/0013189X08331140

Desimone, L. M., & Garet, M. S. (2015). Best practices in teachers' professional development in the United States. *Psychology, Society, & Education, 7*(3), 252–263. https://doi.org/10.25115/psye.v7i3.515

Desimone, L. M., & Pak, K. (2017). Instructional coaching as high-quality professional development. *Theory Into Practice, 56*(1), 3–12. https://doi.org/10.1080/00405841.2016.1241947

Guskey, T. R. (2002). Professional development and teacher change. *Teachers and Teaching, 8*(3/4), 381–391. https://doi.org/10.1080/1354060021000000512

Guskey, T. R. (2014). Planning professional learning. *Educational Leadership, 71*(8), 10–16.

Iqbal, H. M., & Mahmood, N. (2021). Teacher professional development in South Asia: Issues and challenges. *Asian Education Studies, 6*(2), 45–55.

Kausar, F. N., Bashir, F., Hussain, A., & Ahmad, R. (2024). Effect of Teachers' Professional Development on Classroom Management at Higher Secondary Level. *The Critical Review of Social Sciences Studies*, *2*(2), 1039-1049.

Kausar, F. N., & Haroon, A. (2022). Relationship between Formative Assessment Techniques, Students' Learning and Academic Achievement at University Level. *Pakistan Languages and Humanities Review*, *6*(3), 309-319.

Kennedy, M. M. (2016). How does professional development improve teaching? *Review of Educational Research, 86*(4), 945–980. https://doi.org/10.3102/0034654315626800

Knight, P., Tait, J., & Yorke, M. (2015). *The professional learning of teachers in higher education.* Routledge.

Li, Y., Garza, V., Keicher, A., & Popov, V. (2019). Predicting high school teacher professional development participation: A national study. *Teaching and Teacher Education, 86,* 102899. https://doi.org/10.1016/j.tate.2019.102899

OECD. (2019). *TALIS 2018 results (Volume I): Teachers and school leaders as lifelong learners.* OECD Publishing. https://doi.org/10.1787/1d0bc92a-en

Opfer, V. D., & Pedder, D. (2011). Conceptualizing teacher professional learning. *Review of Educational Research, 81*(3), 376–407. https://doi.org/10.3102/0034654311413609

Postareff, L., Lindblom-Ylänne, S., & Nevgi, A. (2007). The effect of pedagogical training on teaching in higher education. *Teaching and Teacher Education, 23*(5), 557–571. https://doi.org/10.1016/j.tate.2006.11.013

Redecker, C. (2017). *European framework for the digital competence of educators: DigCompEdu.* Publications Office of the European Union. https://doi.org/10.2760/159770

Timperley, H., Wilson, A., Barrar, H., & Fung, I. (2007). *Teacher professional learning and development: Best evidence synthesis iteration.* Ministry of Education, New Zealand.

Vescio, V., Ross, D., & Adams, A. (2008). A review of research on the impact of professional learning communities on teaching practice and student learning. *Teaching and Teacher Education, 24*(1), 80–91. https://doi.org/10.1016/j.tate.2007.01.004

Warren, C., Wilson, J., & Muriithi, E. (2024). Teacher professional development and student learning outcomes: A meta-analytic review. *Journal of Education Research, 117*(2), 145–166. https://doi.org/10.1080/00220671.2023.2184229

Wei, R. C., Darling-Hammond, L., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession: A status report on teacher development in the United States and abroad.* National Staff Development Council.

Yoon, S. Y., & Goddard, R. D. (2023). Teacher self-efficacy as a mediator of professional development effects on instructional quality. *Teaching and Teacher Education, 121,* 103932. https://doi.org/10.1016/j.tate.2022.103932

Zhang, W., & Zhu, W. (2018). Teacher professional development in rural China: Challenges and strategies. *Asia Pacific Education Review, 19*(3), 327–339. https://doi.org/10.1007/s12564-018-9540-8