

Impact of Teachers' Professional Development on Students' Academic Performance in Secondary Schools in Pakistan

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Abstract

The study explored the effect of teachers' professional development on students' academic performance in secondary schools. In this study, quantitative research design through survey method was used to investigate the effect of professional development of teachers on students' academic performance. The research sample included 220 teachers and 350 secondary school students selected through a proper sampling procedure. Data were gathered using the structured questionnaire, which assessed teachers' professional development and students' academic performance. Analysis of the gathered data was conducted using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were used to describe respondents' demographics, and a simple linear regression was used to examine the predictive effect of teachers' professional development on students' academic performance. Results revealed that there was a positive and statistically significant effect of teachers' professional development on students' academic performance ($R = .180$, $R^2 = .033$, $F(1, 218) = 7.336$, $p = .007$). Regression analysis further showed that teachers' professional development was a predictor of students' academic performance ($\beta = .180$, $t = 2.709$, $p = .007$). The effect size may be small, since it accounts for 3.3% of the variation in the students' academic achievements. However, this implies that the professional development is positive for the achievement of students. From the study it can be inferred that professional development needs to be continuous, relevant and practical to improve the teaching skills of the teachers and, consequently, the student's learning. It further shows the importance of making professional development efforts in addition to other strategies for improving secondary schools to increase the academic achievement of the students.

Keywords: Teachers' Professional Development; Students' Academic Performance; Teacher Training; Teaching Quality; Instructional Practices; Teacher Effectiveness; Secondary Schools.

Introduction

Professional development and teacher training have been viewed as two of the core components of quality and effectiveness of education. Educational policies, curricula and reforms are implemented in the classroom by the teachers who are the main actors. This means that knowledge, skills and professional competency of teachers becomes a determining factor in determining how students learn and the achievement of their academic performance. Teacher training programs and specifically pre-service education are meant to equip the future teachers with ample back-

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ground knowledge in pedagogy, subject matter knowledge as well as knowledge on the psychology of the learner. However, preliminary training will not be enough to cope with the emerging challenges of the contemporary classroom, thus requiring the ongoing formation of the professional training throughout the career of a teacher (Ullah et al., 2024).

Professional development can be defined as the organized and methodical processes that are aimed to improve the professional knowledge and teaching skills and reflectivity of the teachers in the course of their daily teaching. These programs might be workshops, mentoring, peer work, coaching, action research, technology based learning programs. Research on effective professional development identifies the duration of the change, the alignment with the goals of the curriculum, and the direct relationship to the classroom practice. Studies note that, where professional growth is incorporated in the daily instructional experiences of teachers, then it is bound to have a better impact on the teaching behaviors and enhance the instructional quality (Guskey, 2002).

Within recent decades, professional development has ceased to be a matter of isolated training and has adopted a model of constant, collaborative, and learner-centred approach. Such a change can be viewed as an increased understanding that teachers, similar to their students, can learn best through active involvement, reflection, and collaboration (Baloch et al., 2024). Instructional coaching, professional learning communities, and in-school training programs are designed to help teachers learn together regarding the sharing of experiences, student data analysis, and improved instructional practices. These methods are both professional developmental and aid in the culture of constant enhancement in schools (Desimone and Garet, 2015).

Professional Development and Classroom Instructional Practices

Instructional planning, teaching strategies, classroom management, assessment practices and teacher-student relationships are intricate interactions that result in classroom performance. These variables can be directly associated with teacher training and development since teachers possess means to engage in the learning process and meet the needs of diverse classes and implement teaching methods that help to engage students and promote their learning. When teachers engage in quality professional growth, they are more suited to using learner-centered instruction, differentiate instructional approaches, and assessment information in making instructional choices (Hattie, 2009; Ullah et al., 2024).

The available empirical evidence indicates that professional development increases the pedagogical content knowledge of teachers, which plays a vital role in the exposition of complicated content in a manner that is comprehensible to students. Better pedagogical content knowledge enables teachers to forestall student misconceptions, use several instructional representations, as well as adjust teaching strategies to suit different learning styles. Consequently, classes are more interactive, inclusive and favorable to effective learning (Ullah et al., 2024).

In addition, professional development is very important in enhancing the classroom management and teacher student interaction. Positive behavior support, inclusive practices, and socioemotional learning training can help teachers to establish positive illness learning environments where students feel inspired and appreciated. It has been linked to high levels of student engagement, less behavior and poor performance. Thus, classroom performance increases are one of the major

processes in which teacher training and development have an impact on student learning (Ullah et al., 2023; Yoon et al., 2007).

Teacher Training Effect on Student Achievement

Student achievement is one of the major signs of educational effectiveness and it is also affected by various aspects, such as the quality of the curriculum, the resources of the school and student background. Teacher effectivity is one of the greatest predictors of student academic success and it undoubtedly comes out as a strong factor among these factors. Studies have shown that students that are instructed by highly trained and professionally assisted teachers have increased achievements, better critical thinkers and more motivated toward studies (Hanushek and Rivkin, 2010).

Content-based and instructionally oriented professional development programs have been found to yield tangible improvements in learning outcomes of students. Indicatively, grade specific courses in math and science have been associated with better student performance on test and conceptual knowledge. These indexes are achieved due to the fact that teachers are in a better position to deliver with accuracy and learning gaps are attempted and also students are involved in thinking activities of higher orders (Alwaely, S et al., 2023).

The connection between teacher training and student achievement is, however, not automatic and uniform. Studies have shown that temporary and disjointed training initiatives do not tend to have any long-term impacts on the outcomes of students. Conversely, long-term professional development programs comprising of coaching, feedback, and practice opportunities have higher chances of bringing about significant changes in teaching behavior and consequent increases in student achievement. This flexibility brings about the need to move beyond just assessing the existence of professional development activities, but also their quality, design and execution (Desimone, 2009).

Issues and Discrepancies in Assessment of Professional Development Efficiency

Although it is widely recognized that teacher training and professional development are crucial, it is still one of the main issues that should be evaluated in order to determine their effectiveness. The vast majority of professional development programs are being applied without specific goals or measurable results, and it is challenging to determine the way they influence the teaching practice and student learning. Also, the assessment criteria are usually based on teacher satisfaction questionnaires, which are not objective classroom performance and student achievement (Guskey, 2002).

The other issue is to create a strong cause and effect relationship between professional growth and student outcomes. The positive change in student achievement might not be quick and it can be affected by various contextual variables, including school leadership, student motivation, and socioeconomic status. Consequently, to determine the effects of teacher training initiatives, strict research designs and end-all-inclusive data collection procedures are necessary (OECD, 2019).

Further, most of the current research pursues the perceptions of teachers instead of the class practice changes. This leaves a gap in the literature about the translation of the professional development into everyday instructional behaviors and the influence of the behavior on student learning.

These gaps play a vital role in developing evidence-based models of the professional development that prove effective in supporting the teacher and enhancing the performance of the students.

Purpose and Significance of the Study

The purpose of this study is to examine the impact of teachers' professional development on students' academic performance in secondary schools by assessing its influence on instructional practices and classroom effectiveness. The study also seeks to explore the challenges that hinder the effectiveness of the professional development programs. It is expected that the findings from this study will add significantly to the literature by providing crucial information that can be used to help develop need-based professional development programs that can improve the quality of teaching, strengthen the professional competencies of teachers, and improve the academic performance of students at the secondary school level.

Research Objectives

1. To examine the impact of teachers' professional development on students' academic performance in secondary schools.
2. To assess the influence of teachers' professional development on instructional practices and classroom effectiveness in secondary schools.
3. To identify the challenges affecting the implementation of teachers' professional development and propose recommendations for enhancing its effectiveness in improving students' academic performance.

Problem Statement

Professional development of teachers is a proven way of improving teaching quality and the academic performance of students. Although there have been considerable efforts towards professional development of teachers through professional development programs, very little empirical evidence exists in terms of how effective these programs are in improving instruction and the academic performance of students in secondary schools. In addition, differences in quality, relevancy, and implementation of professional development programs pose the question of their ability to meet the classroom needs of the teachers.

Significance of the Study

The significance of this study lies in its empirical findings regarding the effect of teachers' professional development on academic achievements of students in secondary schools. The empirical findings of the study will help educational policy makers, school managers and teacher educators in developing effective and need-based professional development programs for teachers. Additionally, this study will add to the existing literature by providing insights into the effect of professional development on teaching and academic achievements of students.

Literature Review

Practitioner Education and Professional Development Programs

Professional development has also been discussed widely as an approach that will result in quality and effectiveness of the instruction. The key issue that people raise about the professional development is that it does not have to be limited to workshops with short-term implications only but it should be content-focused, long-term and collaborative and it should be closely related to classroom practice. As per Randel, B et al., (2016), professional development programs that emphasize active learning, standards alignment and support have better possibilities to result in effective changes.

Studies also indicate that professional growth programs are supposed to be sensitive to contextual requirements of teachers, such as the subject areas, student profiling and the overall objectives of the institution. A framework has been put forward by Doppelt, Y et al., (2009) that proposed some of the main features of an effective professional development namely content focus, active learning, coherence, duration, and collective participation. Research that has used this framework has repeatedly consistently determined that programs that include these aspects bring about more changes in the instructional practices of teachers compared to a traditional one-time training session.

Also, the combination of mentoring, coaching, and peer collaboration is revealed as one of the essential elements of effective professional formation programs. Coaching models enable teachers to get the feedback about their instructional practice, reflective about their teaching and put improvements in real classroom contexts. These strategies bring about professional development and long-term modifications in the behavior of instructing, thus improving the overall classroom performance (Garet et al., 2001; Ullah et al., 2026).

Training Effect on Classroom Performance

Classroom performance involves instructional planning, instruction strategies, classroom management, instructional assessment and teacher-student interactions. According to the existing research findings, teacher training and teacher development programs have a positive impact on these aspects as they improve pedagogical competencies of teachers and their confidence in instruction. According to Hoge, D. M. (2016), teacher clarity, feedback and instructional quality are some of the aspects that influence student learning, which can be enhanced through a specialized professional development.

Empirical studies have shown that teachers who engage in sustained professional development programs have better lesson structure, more prevalent student-centered teaching techniques as well as classroom management. Such advantages bring about increased student interaction and learning environment. Indicatively, a positive effect of the outcome of some professional development programs was established by Darling-Hammond, L. (2010) who found that the classroom practices of teachers and student learning outcomes of six months or more were significantly influenced by the professional development programs.

Also, assessment literacy professional development permits teachers to apply the strategies of formative assessment in order to receive the information concerning student progress and modify instruction. This is a student-centered, data-guided instructional method that enhances the alignment of instruction and learning improvement. In turn, improved classroom performance is one of the direct mechanisms of teacher training interventions that affect the performance of students (Ullah & Almani, 2022).

Teacher Training Effect on Student Achievement

Significant literature has been placed to show that teacher quality is closely linked to student academic success. Professional development programs and teacher training are important to improve the effectiveness of teachers by raising the knowledge on the subject matter, instructional methods, and evaluation measures. According to Ullah et al. (2026), and Samundeeswari et al. (2024), teacher quality is a strong predictor of student academic achievement, especially in core academic subjects

Research studies done on subject-specific professional development have shown significant learning outcomes by students. An example is that the teachers who are intensively trained in teaching mathematics or science are more prepared to explain the intricate concepts, misconceptions and impart the higher order thinking skills. Consequently, students show high test scores and conceptual insight (Wallace, M. R. 2009).

However, studies also show that not every program of professional development has a positive impact on student achievement. Short-term programs/poorly developed programs do not tend to yield long-term benefits in student performance. According to Andersson, C., & Palm, T. (2017), the development of the professional needs should be in line with instructional objectives and under follow up activities to guarantee its effective implementation. These results highlight that quality and organization of the professional development programs should be assessed instead of presumed to be effective.

Measuring the Impact of Professional Development Programs

Evaluation of the effect of teacher training and professional development programs is important to realize how they influence classroom performance and achievement of students. Ullah et al. (2023) examined participants' responses, learning consequences, changes in instructional practices, and the impact on student learning. This model emphasizes the need to attach professional development activities to quantifiable outcomes both on the teacher and student levels.

Although there are evaluation frameworks available, numerous studies are greatly dependent on self-reporting data of the teachers which is not always accurate to reflect changes in classroom practice. More objective measures, including classroom observations, student performance data, and longitudinal measures, are more effective evidence of the effectiveness of professional development. According to King, F. (2014). there should be systematic evaluation approaches that are concerned with short-term instructional changes and long-term student outcomes.

Moreover, school leadership, institutional support and availability of resources are contextual issues that have a significant impact on the success of professional development initiatives. Research indicates that the best implementation of professional development is achieved with a ro-

bust leadership approach and collegial school climate (Ullah et al., 2026). Thus, any assessment of professional development programs should be approached in its entirety, taking into account the context of program design and its implementation Harris, D. and Sass, T. (2011).

Research Gaps and Study Objective Alignment

Despite the voluminous research conducted on the topic of teacher training and professional development, there are still unanswered questions on how both factors together influence classroom performance and student achievement especially in certain learning settings. Most of the researches target either the teacher perceptions or the outcomes of the student, but not a simultaneous combination of professional development, teaching and learning activities, and student results.

Moreover, the bodies of research have conducted scarce studies that have systematically matched the professional development evaluation with well-spelt research goals that deal with classroom performance and student achievement. Such gap indicates the necessity of such studies that can incorporate several pointers of effectiveness to give an all-encompassing evaluation of the professional development initiatives. The current research will help to fill these gaps and will therefore be in line with its research objectives and other existing literature on effective-practices of teacher training and professional development.

Methodology

Research Design

This study employed a quantitative research design to examine the impact of teachers' professional development on students' academic performance in secondary schools. Descriptive and regression designs were chosen. The descriptive design was used to describe the demographic profiles and opinions of the respondents concerning the professional development of teachers and academic performance of students. The regression design was chosen to evaluate the influence of the professional development of teachers on the academic performance of students. This type of research design was selected to collect quantitative data and test the study hypothesis by statistical methods.

Population

Teachers and students from public and private secondary schools are the populations of this study. The population is made up of teachers who have been involved in professional development programs before, and also the students enrolled in the secondary schools.

Sampling Technique

Stratified random sampling was used in this research, where teachers and students in both public and private secondary schools were sampled. The sampling procedure gave an excellent level of representative sampling of the two populations.

Sample Size

The sample in this study comprised of 220 teachers from secondary schools and 350 students from secondary schools, giving a total of 570 respondents. This sample size was adequate for the study's purpose.

Data Collection

In this study, the researchers collected data by using questionnaires that were specifically designed for the teachers and the secondary school students. The questionnaire for the teachers assessed their involvement in professional development, their instruction practices, their effectiveness in the class, and their perceived impact on the academic performance of the students. On the other hand, the students' questionnaire was used to evaluate the teaching practices of the teacher and its effect on the students.

Data Analysis

Analysis of the data collected was done using Statistical Package for the Social Sciences (SPSS) version 26. Descriptive statistical techniques, which include frequencies, percentages, means and standard deviations, were applied in summarizing the demographic attributes and the responses provided by the participants to the variables under study. Simple linear regression was applied in determining the influence of the teachers' professional development on academic performance of the students.

Table 1: Reliability Statistics of the Teachers Questionnaires

S. No	Variables	Number of Items	Cronbach's Alpha
1	Participation in Professional Development	5	.793
2	Instructional Practices and Classroom Effectiveness	5	.693
3	Impact on Students' Academic Performance	5	.837
4	Challenges in Implementing Professional Development	5	.798
Total Items with Cronbach's Alpha		20	.830

Table 2: Demographic Information of Respondents (N = 220)

Demographic Variable	Category	Frequency (f)	Percentage (%)
Gender	Male	123	55.9
	Female	97	44.1
Age Group	21–30 years	59	26.8
	31–40 years	80	36.4
	41–50 years	54	24.5
	Above 50 years	27	12.3
Teaching Experience	1–5 years	56	25.5
	6–10 years	73	33.2
	11–15 years	52	23.6

	Above 15 years	39	17.7
School Type	Public	130	59.1
	Private	90	40.9
Professional Training Attended	Yes	174	79.1
	No	46	20.9

Interpretation of Demographic Information

Table 2 displays the demographic information of the study participants. According to the results, 55.9% (n = 123) of the respondents were males while 44.1% (n = 97) were females showing a relatively equal gender distribution. The greatest number of teachers was from the age group of 31–40 years old (36.4%, n = 80), followed by teachers aged 21–30 years old (26.8%, n = 59).

As far as teaching experience is concerned, 33.2% (n = 73) of the respondents had 6-10 years of teaching experience implying that there was considerable experience of working with the students at the classroom level. As for the school type, 59.1% (n = 130) of the respondents worked at public secondary schools, while 40.9% (n = 90) worked at private secondary schools. Also, most of the teachers (79.1%, n = 174) took part in professional training programs, whereas 20.9% (n = 46) did not have such experience. Overall, the demographic information demonstrates that the respondents had relevant professional experience and education, which made them qualified to study the effect of teachers' professional development on their students' academic performance.

Table 3: Teachers' Perceptions of Professional Development

Statement	N	Mean	Std. Deviation
I regularly participate in professional development programs organized by the education authorities or my school.	220	3.61	1.052
Professional development opportunities are provided regularly throughout the academic year.	220	3.83	1.009
The professional development programs I attend are relevant to my professional and instructional needs.	220	3.68	1.086
I actively implement the knowledge and skills acquired through professional development in my classroom instruction.	220	3.86	1.031
My school provides adequate institutional support to facilitate my participation in professional development activities.	220	3.65	1.069

Table 3 shows the descriptive statistics on the involvement of teachers in professional development programs. From the analysis, the results show positive views with mean scores falling between 3.61 and 3.86. The highest mean score was obtained for the use of knowledge and skills gained from professional development programs in teaching classes (M = 3.86, SD = 1.031). The second highest mean score was obtained for the availability of professional development programs regularly (M = 3.83, SD = 1.009). The lowest mean score was obtained for the involvement in professional development programs regularly (M = 3.61, SD = 1.052).

Table 4: Teachers' Perceptions of Instructional Practices and Classroom Effectiveness

Statement	N	Mean	Std. Deviation
Professional development has enhanced my lesson planning and instructional delivery.	220	3.83	1.027
Professional development has improved my classroom management practices.	220	3.79	1.111
I employ a wider range of learner-centred instructional strategies after participating in professional development programs.	220	3.83	1.022
Professional development has strengthened my assessment and feedback practices.	220	4.05	.987
Professional development has improved the overall effectiveness of my classroom instruction.	220	4.08	.908

The Table 4 provides the descriptive statistics regarding instructional practices and classroom effectiveness. As per the analysis, it can be seen that there are positive perceptions and the mean values range between 3.79 to 4.08. In terms of the maximum mean value, the variable which showed the maximum mean value was the improvements in overall classroom instruction, which was ($M = 4.08$, $SD = 0.908$), while the variable which showed second highest mean value was the enhancements in assessment and feedback practices, which was ($M = 4.05$, $SD = 0.987$). The minimum mean value was the improvements in classroom management, which was ($M = 3.79$, $SD = 1.111$).

Table 5: Impact on Students' Academic Performance

Statement	N	Mean	Std. Deviation
Professional development has contributed to improving students' academic achievement.	220	3.61	1.090
Students demonstrate a better understanding of subject content after I implement strategies learned through professional development.	220	3.83	.973
Professional development has increased students' classroom engagement and participation.	220	3.74	1.099
My students demonstrate greater motivation and interest in learning following improvements in my instructional practices.	220	3.86	1.070
The knowledge and skills acquired through professional development have positively influenced students' academic performance.	220	3.74	1.108

Descriptive statistics showing the effect of professional development on students' academic performance are presented in Table 5. Mean scores varied between 3.61 and 3.86, which means that there were positive perceptions of teachers about the issue under discussion. The maximum mean score was observed in the case of students showing increased motivation and interest in learning due to improvement in teaching techniques ($M = 3.86$, $SD = 1.070$), while the minimum one

concerned the contribution of professional development to improvement in students' academic performance ($M = 3.61$, $SD = 1.090$).

Table 6: Challenges in Implementing Professional Development

Statement	N	Mean	Std. Deviation
Heavy teaching responsibilities limit my participation in professional development programs.	220	3.65	1.123
Professional development programs are not always aligned with teachers' classroom needs.	220	4.18	.862
Limited follow-up support reduces the long-term effectiveness of professional development programs.	220	4.10	.938
Insufficient school resources hinder the effective implementation of knowledge gained through professional development.	220	3.59	1.125
Continuous professional development should be strengthened to improve teaching quality and students' academic performance.	220	3.73	1.088

The descriptive statistics of challenges relating to professional development are found in Table 6 below. Mean scores varied between 3.59 and 4.18, showing that the challenges were mostly supported by the respondents. The highest mean score was recorded for the challenge of mismatch between professional development and teacher classroom needs ($M = 4.18$, $SD = 0.862$). Close to the top was lack of follow-up support that would decrease the effectiveness of the program ($M = 4.10$, $SD = 0.938$). Least supported challenge was the challenge of insufficient school resources limiting the application of the acquired knowledge ($M = 3.59$, $SD = 1.125$).

Table 7: Reliability Statistics of the Students Questionnaires

S. No	Variables	Number of Items	Cronbach's Alpha
1	Teaching Effectiveness	5	.745
2	Classroom Learning Environment	5	.770
3	Students' Academic Performance	5	.785
4	Students' Perceptions of Teachers' Professional Development	5	.728
Total Items with Cronbach's Alpha		20	.710

Table 8: Students' Perceptions of Teaching Effectiveness

Statement	N	Mean	Std. Deviation
My teachers explain lesson concepts clearly and effectively.	350	3.57	1.130
My teachers use a variety of teaching strategies to enhance my understanding of lessons.	350	3.66	1.128
My teachers encourage students to participate actively in classroom learning activities.	350	3.65	1.170
My teachers use practical examples and learning activities that	350	3.81	1.081

facilitate understanding.

My teachers manage classroom activities effectively to support350 4.09 .879
learning.

Table 8 shows the results of descriptive statistics on the students' perceptions of teachers' instructional practice. The average scores varied between 3.57 and 4.09, which indicated the presence of positive perceptions. The highest average score was obtained from the teachers' classroom management effectiveness ($M = 4.09$, $SD = 0.879$), then the use of practical examples and learning exercises ($M = 3.81$, $SD = 1.081$). The lowest average score was received from the teachers' ability to explain lesson concepts clearly and effectively ($M = 3.57$, $SD = 1.130$).

Table 9: Students' Perceptions of Classroom Learning Environment

Statement	N	Mean	Std. Deviation
My teachers create a positive and supportive classroom learning environment.	350	3.68	1.084
My teachers motivate students to achieve high academic standards.	350	3.75	1.041
My teachers provide timely and constructive feedback on classroom assignments and assessments.	350	3.75	1.094
My teachers treat all students fairly, respectfully, and without discrimination.	350	3.83	1.048
My teachers encourage critical thinking, creativity, and problem-solving during classroom instruction.	350	3.68	1.120

The Table 9 below gives the descriptive statistics of students' perceptions of the teachers' effectiveness. The mean values were between 3.68 to 3.83, which is quite a positive perception. The highest mean value was teachers treat the students fairly and respect them ($M=3.83$, $SD=1.048$), while the lowest mean value was the same for teachers create supportive learning atmosphere and encourage students to think critically ($M=3.68$, $SD=1.084$; $M=3.68$, $SD=1.120$, respectively). In general, it can be concluded that students perceived their teachers as effective in creating a positive learning atmosphere.

Table 10: Students' Academic Performance

Statement	N	Mean	Std. Deviation
My teachers' instructional practices have improved my understanding of the subjects I study.	350	3.65	1.125
Effective teaching by my teachers has contributed to my improved performance in examinations.	350	3.77	1.064
My teachers' instructional methods help me achieve better academic outcomes.	350	3.83	1.074
My teachers' support has increased my confidence in completing academic tasks successfully.	350	3.97	.995
My overall academic performance has improved as a result of my teachers' effective instructional practices.	350	3.79	1.078

Table 10 shows the descriptive statistics for students' perceptions regarding the link between teachers' instructional practices and students' academic achievement. The mean values were between 3.65 and 3.97. These values reflect positive perception. The highest mean value was reported in relation to the increased confidence of students to complete academic tasks due to the support provided by teachers ($M = 3.97$, $SD = 0.995$). On the other hand, the lowest mean value was reported concerning the increased understanding of subjects due to teachers' instructional practices ($M = 3.65$, $SD = 1.125$).

Table 11: Students' Perceptions of Teachers' Professional Development

Statement	N	Mean	Std. Deviation
My teachers appear well-prepared and confident during class-room instruction.	350	3.80	1.048
My teachers use updated and innovative teaching methods during lessons.	350	3.79	1.003
My teachers effectively use teaching aids and educational technologies to support learning.	350	3.85	1.018
My teachers encourage collaborative, interactive, and student-centred learning activities.	350	3.85	1.067
My teachers continuously improve their teaching practices to enhance students' learning and academic performance.	350	3.82	1.022

Table 11 highlights the descriptive statistics on the students' perception of teachers' professional competence. The mean values were between 3.79 and 3.85, showing positive perceptions. The highest mean value was obtained on effective utilization of teaching aids and technology by teachers, as well as promoting collaborative and interactive learning by the teachers ($M = 3.85$), whereas the lowest mean value was recorded in the utilization of the latest teaching techniques by the teachers ($M = 3.79$, $SD = 1.003$). Thus, the results indicate that students have a perception of teachers being professionally competent and committed to enhancing their teaching techniques continually.

Table 12: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.180a	.033	.028	.76507

a. Predictors: (Constant), Teacher Professional Development.

The Regression Model Summary table for the effect of teacher professional development on student academic performance is shown in Table 12 below. This analysis shows that there is a positive correlation ($R = .180$). The model accounted for 3.3% of the variation in student academic performance ($R^2 = .033$; Adjusted $R^2 = .028$), indicating a positive contribution by teacher professional development.

Table 13: ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.294	1	4.294	7.336	.007b
	Residual	127.603	218	.585		
	Total	131.897	219			

a. Dependent Variable: Students Academic Performance.

b. Predictors: (Constant), Teacher Professional Development.

The ANOVA table of the regression model is illustrated in Table 13 below. From the results, the regression model was found to be significant statistically ($F(1, 218) = 7.336$, $p = .007$), showing that professional development of teachers had a significant influence on students' academic performance.

Table 14: Regression Coefficients

Model	Unstandardized Coefficients		Standardized T Coefficients		Sig.
	B	Std. Error	Beta		
1 (Constant)	2.917	.303		9.634	.000
Teacher Professional Development	.206	.076	.180	2.709	.007

a. Dependent Variable: Students Academic Performance.

Table 14 displays the regression coefficients that analyze the influence of teachers' professional development on students' academic performance. It can be seen from the results that teachers' professional development was a statistically significant positive predictor of students' academic performance ($\beta = .180$, $B = .206$, $t = 2.709$, $p = .007$). The positive regression coefficient implies that greater levels of teachers' professional development contribute to better students' academic performance.

Decision on the Hypothesis: As $p = .007 < .05$, the null hypothesis is rejected. This means that there is a statistically significant positive influence of teachers' professional development on students' academic performance.

Discussion

In this study, the effect of professional development on the academic performance of students in secondary schools was investigated. Results from the study showed that teachers had positive perceptions about their participation in professional development activities, instructional strategies, and the effect of professional development on the learning outcomes of the students. Descriptive results have shown that teachers effectively use the knowledge and skills they acquire from professional development programs, perceive the training program as relevant to their instructional requirements, and improve in classroom instruction, assessment, and effectiveness of teaching.

In addition, the regression results show that there is a positive and statistically significant relationship between professional development of teachers and students' academic performance ($R =$

.180, $R^2 = .033$, $F(1, 218) = 7.336$, $p = .007$). Professional development only explains a small part of the variability of academic performance of students (3.3%). However, the regression coefficient is significant ($\beta = .180$, $B = .206$, $t = 2.709$, $p = .007$), indicating that improvement in professional development of teachers leads to increased academic performance of students.

From the above findings, it is evident that professional development contributes significantly to students' academic success, although there are many other factors that affect academic success in schools. Findings of this study are in line with previous empirical studies on this topic. For example, Ullah et al., (2026) observed that quality professional development increases teachers' instructional knowledge and results in improved student outcomes. In the same manner, De Vries et al. (2022) found out that quality and practice-focused professional development affects teaching effectiveness and student outcomes positively. Further, Darling-Hammond et al. (2017) argue that quality professional development impacts the quality of instruction positively by increasing teachers' pedagogical knowledge and assessment.

In addition, teachers indicated various challenges affecting the effectiveness of professional development, such as lack of alignment between training programs and classroom needs, lack of follow-up and school-based resources. These findings mean that the effectiveness of professional development depends not only on teachers' involvement but also on quality and sustainability of training programs. Overcoming the above challenges will improve the effect professional development on instructional practices and students' academic performance.

In summary, the results obtained indicate that teacher professional development is a critical aspect in improving teaching methods and performance of pupils in secondary schools. Consequently, education policymakers and school management should intensify professional development programs for teachers so that they become more effective in their work and ensure better performance by students.

Conclusion

The results obtained in the present study indicate that there is a significant impact of the professional development of teachers on the academic performance of secondary school students. In their responses, teachers participating in professional development programs reported improvements in the areas of instruction, classroom management, assessment and general teaching effectiveness. It has been established by the results of regression analysis that the teachers' professional development significantly predicts the academic performance of students ($\beta = .180$, $t = 2.709$, $p = .007$), which shows that the enhancement of professional development leads to improvement in student performance; however, the degree of explanation of the results is relatively low ($R^2 = .033$).

The results show that the efficiency of professional development programs depends on their quality, relevance and continuity. Difficulties, such as poor relevance of training, lack of follow-up and insufficient availability of resources may lower the level of effectiveness of professional development programs.

Future Implications

The results indicate that it is important for educational policy makers to improve the professional development programs that focus on need-based learning and classroom-based training in order to increase teaching quality and boost academic achievement of students. Further research should look at other variables affecting academic achievement of the students.

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