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RESEARCH PAPER

Impact of Teachers' Professional Development Programs on Classroom Effectiveness at the Public Secondary Schools: Evidence from District Shaheed Benazirabad

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ABSTRACT

Education is a key driver of national development, and the effectiveness of teaching practices significantly influences students' learning outcomes. Professional development (PD) programmes for teachers play a crucial role in enhancing instructional quality and classroom efficiency in modern educational systems. This study investigated the effects of teachers' professional development programmes on classroom effectiveness in state secondary schools in District Shaheed Benazirabad, Sindh. Specifically, it examined the relationship between in-service training, ICT-based professional development activities, ongoing PD workshops, and peer collaboration with classroom effectiveness. A quantitative, non-experimental, correlational research design was used. From the total population of secondary school teachers in the district, a sample of 384 teachers was selected using Cochran's formula. Data were collected through a structured questionnaire distributed via Google Forms and analyzed using SPSS. Descriptive and inferential statistics, including reliability analysis and regression, revealed that all PD factors positively influenced classroom effectiveness, with peer collaboration emerging as the strongest predictor of improved teaching practices and student engagement.

KEYWORDS	Teacher Professional Development, Classroom Effectiveness, In-Service Training, ICT-Based Professional Development, Professional Development Workshops, Peer Collaboration

Introduction

Education is one of the pillars of national growth in that, the quality of instruction has a direct impact on student performance. The professional development (PD) of teachers is one of the essential aspects of improving classroom efficacy and increasing the achievements of scholars. PD takes on a wide range of learning activities, such as workshops, mentoring, collaboration between peers, and ICT-based training activities, which are aimed at enhancing pedagogical practices, classroom management, and student engagement. Empirical studies have always made it clear that well-functioning PD programs are enduring, content-focused, and comply with the school change (Muzaffar, 2016; Darling-Hammond et al., 2017; Desimone and Garet, 2015; Muzaffar, et. al. 2020). Some examples of teacher development in Pakistan include the National Professional Standards of Teachers (NPSTP), which was launched in 2009 by the Ministry of Education. These standards focus on competencies that cut across subject knowledge, pedagogy, assessment, and classroom management. However, it often cannot be implemented because of the lack of resources, proper follow-ups, and monitoring

(UNESCO, 2020). This deficiency is more critical in Sindh, where obsolete pedagogical principles and lack of classroom discipline are common even though training institutions such as STEDA and PITE have been established. Research in Pakistan has highlighted the PD-classroom efficacy nexus. The results of research conducted by Kiran, Bashir, and Ahmed (2022) in Punjab and by Ullah and Khan (2024) in Balochistan also evidence that PD positively affects the practices of teachers in the classroom, their interactions with students, and their motivation. Sindh, on the contrary, is a more complicated situation which is rife with infrastructural inadequacies and bureaucratic obstacles (Imran, Sultana, & Ahmed, 2023). In regions like Shaheed Benazirabad where training programmes are carried out in cities, there are monumental challenges that face the initiative, which are poor access of resources, low attendance, and insufficient incentives to motivate the educators. The Pakistan Bureau of Statistics (2021) estimated that just 40 percent of the teachers in secondary schools Shaheed Benazirabad in the last five years are (formally) instructed in PD, and that less than 25 percent of teachers in rural areas are (formally) taught in PD workshops due to the hardships of travel and understaffing. In spite of the fact that training programmes offered by STEDA and PITE can be considered to be in line with the national standards, their effectiveness is still limited; most teachers believe that such programmes are not in touch with the realities in classrooms in case the curriculum has been made generic without being adjusted to circumstances. This disconnection can be observed particularly in such a place as Shaheed Benazirabad where the teachers are faced with distinct linguistic, cultural, and socioeconomic issues in the classroom. Besides, ICT-based PD has potential benefit of interactive and student-centered learning; nonetheless, in rural areas, there is a lack of digital infrastructure and access to internet connectivity, which prevents the efficient implementation of ICT training programs (Gulzar and Jabeen, 2021). This paper aims to analyze the effects produced by PD programmes on classroom performance in Sindh with a special focus on how the programs affect the performance of the classroom, the teaching practices, student interest and classroom performance (Azhar & Imran, 2024).

In the current educational environment, effective teaching standards cannot be spared in enhancing the achievement of academic performance and overall growth in the students (Oad, et al., 2024; Imran & Akhtar, 2023). Darling Hammond et al. (2017) highlight that teacher professional development of teachers provides up to date pedagogical knowledge and the demanded skills to meet 21st-century learning needs (Imran, Zaidi, & Rehan, 2024). Although countries all over the world know the importance of PD, nations like Pakistan still find it difficult to implement substantive and sustained PD programs. The Pakistani system of the public schools, particularly secondary level, is filled with crude teaching techniques, poor performance on the part of the students, and poor management of classes. Most of the Pakistani learners do not achieve minimum levels of proficiency, a deficiency cited by UNESCO (2020) due to ineffective delivery and little use of the student-centered strategies. One of the major obstacles is lack of proper, practice-based training of teachers. Pakistanis use PD that is largely theoretical, short-term, and abstracted, not related to classroom settings (Khan and Shah, 2020). In spite of the introduction of the NPSTP in 2009 by the government, there has been a limitation in its application. Professional development of thousands of teachers is offered by organizations like STEDA and PITE; however, low follow-up, low rural reach, and weak ICT integration continue to be the matters of concern (Gulzar and Jabeen, 2021). Such problems are even more acute in the Shaheed Benazirabad district, where the majority of the teachers do not have access to the right opportunities in PD. Despite the current activity, there is little empirical support that PD increases classroom effectiveness in this respect. The proposed investigation will close this gap by

examining the effects of different aspects of PD on the classroom effectiveness of the public secondary schools of the district.

A teacher is the cornerstone of any school system and it is crucial that the teacher is engaged in a constant professional development (PD) to help increase his or her classroom performance and student achievement. PD is an urgent reform agenda in Pakistan, where the teaching standards have remained a vexed issue that needs to be transformed to realize the vision of updating the teaching methods, student engagement, and consequently improvement of teaching standards. The study is important because it evaluates the impacts of various components of PD that include in-service training, ICT-based learning, workshops, and peer collaboration on classroom performance in the Shaheed Benazirabad district public secondary schools. To educators, the study determines the most effective PD modalities to support teaching and learning, instructional management, and instructional assessment of learners, which can be used in professional decision-making and promoting collaborative, technology-based practices. Among school leaders, the findings give evidence-based solutions to empower teacher support systems, build mentoring systems, and the culture of everlasting learning. These lessons can also be used by policymakers and provincial education authorities (such as STEDA, PITE, and the Reform Support Unit (RSU)) to improve on their current PD designs, and make them more mindful of the real classroom needs of teachers in underprivileged areas, such as inner Sindh. Another gap that the research serves in filling is that by ensuring the use of empirical data on a frequently marginalized district in national research. The recommendations will be used to design further interventions to strengthen professional development programmes in similar learning institutions and promote achievement of Sustainable Development Goal 4 (SDG-4) on quality education.

Literature Review

Teachers' Professional Development

The ongoing process of gaining new information, abilities, and attitudes to enhance teaching methods and improve student learning outcomes is known as professional development (PD) for teachers. PD is a methodical endeavor aimed at altering teachers' classroom behaviors, attitudes, and beliefs as well as students' learning outcomes (Imran, Zaidi, & Khanzada, 2023; Khatoon et al., 2024). It is now seen as a continuous process of development rather than a one-time training exercise (Guskey, 2002; Wasan et al.,1978). Another researcher highlighted that teachers can experiment with new teaching techniques, critically evaluate their instructional practices, and work with peers to improve their teaching practices when they receive high-quality professional development (Darling Hammond et al., 2017; Bukhari et al., 2024). Both formal and informal learning experiences are included in the scope of professional development. While informal learning could include peer learning, self-reflection, and mentoring, formal PD includes workshops, seminars, in-service training, online courses, and academic certificates. Successful PD is associated with improved teaching approaches, classroom management, and assessment (Villegas-Reimers, 2003; Bukhari, 2025). PD also significantly contributes to teacher motivation, job satisfaction, and retention.

Dimensions of Professional Development

It considers four main aspects of professional growth, each with its own specific role in improving the performance of teaching and classroom efficiency.

In-Service Training Programs

In-service training is professional learning done by teachers while in active service of teaching. Examples include refresher courses, pedagogical skills development workshops, curriculum orientation workshops, and testing training (Danish, Akhtar & Imran, 2025; Mankash, et al., 2025; Hafeez, Yaseen & Imran, 2019). In-service training is necessary to familiarize teachers with new policies, methods, and technology (Phulpoto, Oad, & Imran, 2024; Oad, Zaidi, & Phulpoto, 2023). Avalos (2011) holds that effective in-service training has the ability to close the gap between past practices and present educational needs, thus positively influencing classroom dynamics.

ICT-Based Professional Development

The ICT-based professional development entails the introduction of digital resources and platforms in the training process (Khoso, et al., 2024; Sultana & Imran, 2024; Ahmad, Bibi & Imran, 2023). There is online working, webinars, video-based instructions, digital instructions, and Learning Management System (LMS). ICT incorporation in PD offers flexibility and facilitates interactive and personalized learning to the teachers (UNESCO, 2020; Bukhari et al., 2024). It promotes innovation and helps a teacher to use the current equipment to engage students.

Professional Development Workshops

Workshops are brief concentrated training programs that are meant to tackle a particular component of crisis like lesson planning, classroom management or subject-content improvement (Imran, Zaidi, & Rehan, 2024). Although they provide focused contribution, research indicates that a single workshop might not result in sustainable transformations unless coaching or support of implementation (Desimone, 2009; Mahmood et al., 2025). Nevertheless, workshops may renew the practice of teachers, as well as make them more confident, provided they are properly designed and conducted.

Peer Collaboration Among Teachers

Peer collaboration is the profession interaction and collaboration of teachers in the form of, co-teaching, teacher mentoring, lesson study, and group reflection (Ahmed, & Imran, 2024; Ahmed, 2023). Vangrieken et al. (2015) argue that collaborative professional learning can result in mutual support, sharing of knowledge, and maintaining a lasting change in classroom practice. Peer interaction also helps to curb professional isolation and creates a school culture of constant bettering.

Classroom Effectiveness

Classroom effectiveness is how well teachers are able to provide an effective learning environment that contributes to the achievement of their students. It consists of efficient lesson planning, classroom management, student engagement, assessment on time, and the application of instruction strategies that suit the needs of students (Stronge, 2018; Hsu et al., 2024). The studies indicate that pedagogical knowledge, communication qualities, resource utilization, and the possibility to revise the instruction according to the student feedback determine the effectiveness of the classroom (Muijs & Reynolds, 2017).

Key indicators of classroom effectiveness include:

I.   Clear lesson objectives

II.   Active student participation

III.   Efficient use of class time

IV.   Constructive feedback

V.   Discipline and respectful classroom culture

These indicators reflect how professional development directly influences the quality of teaching and learning processes.

Theoretical Framework

Every academic research has a solid theoretical framework which serves as the basis of developing objectives, research questions, research hypotheses and how the results will be interpreted. In the current research, where the impact of teacher professional development on the classroom effectiveness in secondary level schools will be investigated, theoretical background will be explained by using three significant frameworks of Guskey Model of Teacher Change, Adult Learning Theory developed by Malcolm Knowles, and Constructivist Learning Theory. These theories have a critical impact on understanding the process through which teachers develop the professional competencies and the role played by these competencies on their practices and classroom performance.

Guskey's Model of Teacher Change (2002)

As a way to show the process of significant professional development, which subsequently brings about changes in classroom activities that subsequently bring about improved student learning, Guskey (2002) Model of Teacher Change gives a step-by-step performance of these processes. Guskey reckons that the changes in teachers' attitudes and beliefs which are most enduring occur once teachers believe that the new practices are advantageous to them. According to his model, by engaging in a properly designed professional development, the teachers are able to implement new strategies in their individual classes, and as long as they see students react positively, they tend to encourage and internalize the changes (Rehan, et al., 2024, Ahmad, et al., 2024). This model is also of appropriate interest to the present study considering the fact that in-service training, professional workshops, and ICT-based learning activities are all aimed at modifying and improving the practices in classrooms.

Knowles' Adult Learning Theory (1980)

The paper relies on the Adult Learning Theory developed by Knowles (1980) implemented in the study to comprehend professional development among teachers as the type of adult learners. Knowles assumed that adult learners are self-directed, goal-oriented and have an abundance of experience to the learning process (Shah, et al., 2025; Mohammad, et al., 2024; Imran, et al., 2023). They are better motivated to learn when the contents are closer to their immediate professional requirements and that learning is problem-centered and not content-centered (Khoso, et al., 2024; Sultana, Ahmed, & Imran, 2024; Sarmad, 2016). The theory has been important in the context of teacher

development since it offers practical, hands-on training programmes that are specific in the challenges that teachers encounter in classroom. To illustrate, peer collaboration and ICT-based learning systems will be most useful when they offer a teacher timely and practical solutions and the chance to discuss and reform his teaching methods.

Constructivist Learning Theory

Additional reinforcement comes in the Constructivist Learning Theory that focuses that learning is made by way of being active and interacting with other people. This view has its basis in Piaget and Vygotsky with emphasis on the importance of learning by doing, discussion, and teamwork. Constructivism in the area of teacher professional development emphasizes the importance of professional learning communities, mentoring relations and joint planning in promoting instructional capacity. According to the Azhar, Iqbal and Imran (2025) teachers can learn better in engaging meaningful discussions with their peers, in watching each other teach, and in cogitating on pedagogical strategies collectively. As such, peer collaboration is not solely a means to engage in professional development, but also provide a platform of continued teacher learning and joint development.

Empirical Review

This part examines the empirical studies associated with the variables of the present study both on the international and local foundation. The subsections relate to the independent variables of this research paper and offer an insight on available research findings to the effect of these variables on classroom effectiveness.

In-Service Training Programs and Classroom Effectiveness

Advantages of in-service training programmes on teaching and learning, especially among the students, have been highlighted in numerous studies. The impact of the programmes of professional development with an average of 49 hours was considerable on the attainment of students (Yoon et al., 2007). Likewise, in the case of the developing countries, Avalos (2011) pointed out that in-service training gives teachers the chance to coordinate with new curricula and instructional applications, which leads to better delivery of instructions. On the influence of in-service training of teachers in secondary schools, Khattak and Abassi (2019) studied the variables and discovered that trained teachers displayed improved classroom management skills, engagements with students, and lessons planning skills. The research however also revealed that the success of such programmes also largely relies on the post training follow up support that is availed. These results help to believe that the ongoing, in-service programs assist in improving the effectiveness of the classroom.

ICT-Based Professional Development and Classroom Effectiveness

The use of ICT in the professional development of teachers has been on rampage. According to Lawless and Pellegrino (2007), ICT-based PD programs assist teachers to incorporate technology in their teaching process and thus learners achieve interactive and student-centred learning amidst their teachers. Prestridge (2012) in another study established that lecturers that participated in online PD platforms exhibited confidence in using digital tools and better student performance. Gulzar and Jabeen (2021) investigated the efficacy of ICT-based PD in government schools of Sindh, which is the Pakistani context. Because ICT tools were accessible, they discovered that the limited digital literacy and infrastructure inhibited the best utilization of these tools.

Professional Development Workshops and Classroom Effectiveness

The workshops are one of the most common types of professional development. Borko (2004) indicates that brief workshops can be effective in that they need to be a focused memory, a subject matter and followed up by practice. The workshops which include active learning, coordinate with the organizational objectives and ensure concerted efforts among the personnel members are considered to be effective (Garet et al., 2001). Mahmood and Shah (2015) conducted a study in Punjab, Pakistan, and reported that, post-intervention, the instructors who attended these workshops showed improvements in the planning of lesson, and delivery of content, as well as the use of teaching aids. However, the authors were cautious that, without either a prolonged assistance or peer feedback, the advantages of workshops are likely to fade away in the long run. Such findings emphasize the fact that even though workshops could have a positive effect on the classroom performance, their long-term effect will depend on continuity and relevance.

Peer Collaboration and Classroom Effectiveness

Peer collaboration, in the form of team teaching, lesson study, and teacher learning circles, has been shown to enhance instructional practices. According to Vescio, Ross, and Adams (2008), professional learning communities improve teacher performance and student achievement by encouraging reflective dialogue and shared practice. Similarly, it is claimed that cooperative environments support educator in solving real-time classroom challenges (Darling Hammond et al. ,2017). Locally, Rehman and Baig (2020) conducted a study in Sindh province and found that schools promoting peer collaboration had more effective teachers, better classroom management, and improved student interaction. Teachers who engaged in regular peer discussions were also more adaptive and innovative in their pedagogy.

Research Hypothesis

H1: There is no significant effect of in-service training programs on classroom effectiveness.

H2: There is no significant impact of ICT-based professional development activities on classroom effectiveness.

H3: There is no significant effect of ongoing professional development workshops on classroom effectiveness.

H4: There is no significant effect of peer collaboration among teachers on classroom effectiveness.

Conceptual Framework

The conceptual framework of current research illustrates the hypothesized relationship between the independent and dependent variables. As shown in the diagram, the study investigates four key components of teachers' professional development such as in-service training programs**,** ICT-based programs**,** workshops, and peer collaboration and their influence on classroom effectiveness, which is the dependent variable. This model rests on the basis of modern literature that highlights the complex nature of professional development in improving the quality of instructions, classroom organization, and student resource (Darling-Hammond et al., 2017; OECD, 2019). All the

independent variables are based on well-known models of teacher-learning and correspond to the National Primary School Teaching Programme (NPSTP). The framework assumes that there is a direct liaison where one type of professional development leads to increase of the efficacy of classroom. Moreover, it provides a graphic design that aids in deriving research aims and hypotheses, guides the construction of the research tool, and provides appropriate statistical application methods.
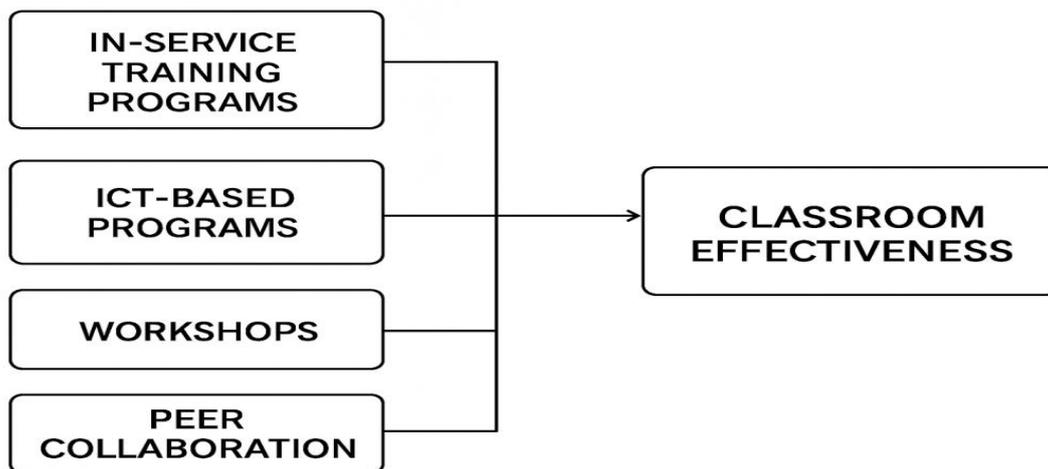

Figure 1 Conceptual Framework

Material and Methods

The present study employed a quantitative, non-experimental, correlational research design to examine the effect of key components of teachers' professional development on classroom effectiveness at the secondary school level in District Shaheed Benazirabad. This design is suitable as it allows for the analysis of relationships between naturally occurring variables without manipulating them (Creswell, 2014). As the study focused on assessing the influence of in the current research, the type of design was a correlational, non-experimental, quantitative design to investigate the relationship between the most essential aspects of the professional growth of teachers on efficacy in classes at the secondary-school level conducted in District Shaheed Benazirabad. The design is suitable since it allows exploring the relationships between variables that happen naturally without interventions (Creswell, 2014). As the part of the research focused on the effect of the independent variables on a single dependent variable, which is classroom effectiveness, on the in-service training, ICT-based professional development, peer collaboration, and professional workshops, experimental control or comparison groups were not needed. Based on it, the experiment evaluated the magnitude and goodness of association as well as the direction of association between variables using statistical and hypothesis testing. Since the researcher did not interfere with and modify existing professional development activities of teachers, the research design is rightfully defined as non-experimental. Further, the correlational type of the research aims at explaining statistically significant correlations between the variables. The sources of information were a cross-sectional survey and a structured questionnaire, where the information was gathered at one point in time to have the information about the up-to-date practices in PD, and the effect of the latter on the effectiveness of teaching in the chosen district. Independent variables such as in-service training, ICT-based

professional development, professional workshops, and peer collaboration on a single dependent variable, classroom effectiveness, there was no need for experimental control or comparison groups. Instead, the research determined the strength and direction of associations between variables using statistical analysis and hypothesis testing. Since the researcher didn't interfere with or alter teachers' ongoing professional development activities, the design qualifies as non-experimental. Additionally, it is correlational in nature, aiming to explore statistically significant relationships among variables. Data was be collected using a cross-sectional survey method through a structured questionnaire administered at a single point in time. This approach will help capture current PD practices and their potential impact on teaching effectiveness within the selected district.

The population of the research consisted of all the teachers of the public secondary-schools within the District Shaheed Benazirabad, Sindh, Pakistan. These instructors teach students in the 9th and 10th grades and are actively engaged in classroom instruction, student testing, curriculum execution, and classroom management, and, thus, have a direct relevance to the objectives of the study. It was a randomly chosen population, as the teachers of the Sindh publicly-schools are regularly enrolled in professional development programs organized by government bodies like the Sindh Teachers Education Development Authority (STEDA) and the Provincial Institute of Teacher Education (PITE). In these programs, in-service training, development using information technologies, workshops, and working in pairs are included as some of the key variables discussed in this research. By focusing on this particular population, the researcher will be able to generate findings that are contextually based on the facts of the state of school education, and especially so in the rural and semi-urban setting. In addition, the internal validity and consistency of the results of the study will be strengthened since the training policies, administrative structures, and resources allocation used by the public schools in Sindh will be homogenous. This design is consonant with the aim of the study and its investigation of the real effect of the professional-development programmes in the context of the public high-school education in low-researched districts.

A sample is a demonstration of a grouping of a population that is especially chosen to represent features about the whole population (Fraenkel, Wallen, and Hyun, 2012). The sample in the given study was the teachers working in secondary-schools in the District Shaheed Benazirabad schools which are in the public sector. These were teachers who were selected based on the fact that they are directly involved in classrooms instruction as well as regular involvement in all sorts of professional development activities such as in-service trainers, ICT based programmes, workshops and peer collaboration programs. The number of secondary-school teachers in the district does not exist as official records and hence the sample size was determined according to formula of Cochran (1977) large or undefined populations. This method is popular among social-science researchers in order to obtain a representative and statistically valid sample in cases when the total population is not known and large. As a result 384 respondents were recruited and included in the research.

The main tool that was used to collect data in the study was a structured questionnaire that was based on the instruments that were tested in the literature and validated. The objective of the questionnaire was to determine the perceived role of four important elements of teacher development that include in-service training, ICT based training, the professional development workshops, or peer collaboration on classroom effectiveness. Materials were based on already published research, such as Darling-Hammond et al. (2017), Garet et al. (2001), Yoon et al. (2007), and OECD (2019), but with

local variations of items related to the secondary school in District Shaheed Benazirabad. The questionnaire will have six parts which will include demographics, the four independent variables and the dependent variable. The answers were obtained on a 5 - point Likert scale, with the options of Strongly Disagree to Strongly Agree. The instrument will be reviewed by experts and a pilot study will be conducted, to verify the content validity and contextual relevance of the instrument, and help strengthen the reliability and applicability of the instrument.

The information required by this study was gathered using an adapted, structured questionnaire through the provision of Google Forms electronically. The tool was created to be utilized to gauge the perceived effects of the professional development of teachers on classroom effectiveness and was being established with the help of tools that were proven in the literature. The questionnaire had to be changed to suit the educational setting of the Pakistani public secondary schools of District Shaheed Benazirabad to make the necessary alteration. Before the actual data collection, a pilot study was carried out on 30 teachers at secondary school who were not the subjects of the final sample. Questionnaire was also made to have satisfactory level of reliability with the coefficient of Cronbach alpha being above the 0.70 level on all constructs. Since logistical constraints and widespread and at the same time timely use were required, the questionnaire was distributed in the electronic version through the Google Forms.

Data analysis used in this study was aimed at testing the impact of teachers' professional development on classroom performance in the secondary level. Since a quantitative, hypothesis-testing methodology was followed in the study, both descriptive and inferential statistics were used. After the data was collected using a structured Google Forms survey, it was cleaned before being coded and then importing into SPSS (version 21) to perform the analysis. Descriptive statistics such as frequencies, percentages, means, and standard deviations was computed to summarize respondents' demographic characteristics and to assess the distribution and central tendencies of responses across questionnaire items. To assess the internal consistency of the instrument, Cronbach's alpha was calculated for each construct (in-service training, ICT-based PD, workshops, peer collaboration, and classroom effectiveness).

Results and Discussion

Table 1
Distribution of Demographic Variables

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	150	39.1%
	Female	234	60.9%
Educational Qualification	Bachelor's Degree	180	46.9%
	Master's Degree	140	36.5%
	M.Phil/Ph.D.	64	16.7%
Teaching Experience (Years)	5 Years or Less	120	31.3%
	6-10 Years	140	36.5%
	11+ Years	124	32.2%

The table above demonstrates demographic variables of the participants of the study in terms of frequency, and percentage. There were 384 respondents who participated in the research. In terms of gender, most of the participants were females since 234 (60.9%) female teachers were compared to 150 (39.1%) male teachers. With regard to educational level, the largest number were teachers with a Bachelor level (180, 46.9%), and then those with a Master degree (140, 36.5%). The low percentage, 64 (16.7%) had an M.Phil or a Ph.D. Concerning the teaching experience, there was a fairly balanced

distribution of the sample: 120 teachers (31.3%) had five years of experience or less, 140 teachers (36.5%) had between six and 10 years of experience and 124 teachers (32.2%) teachers had over 11 years of experience. This distribution shows that the sample is relatively well balanced with most of the teachers having foundational qualifications and is widely spread in terms of teaching experience.

Table 2
Reliability Analysis for Key Variables

Construct	Cronbach's Alpha (α)	Number of Items
Classroom Effectiveness	0.88	10
In-Service Training	0.84	8
ICT-Based Professional Development	0.85	9
Ongoing Workshops	0.81	6
Peer Collaboration	0.80	7
Overall	0.86	40

The reliability test of the key variables that are used in this study as showed in Table shows that internal consistency of all the constructs is highly reliable. The Alpha coefficients of Classroom Effectiveness (0.88), In-Service Training (0.84) and ICT-Based Professional Development (0.85) are all above the acceptable level of 0.70, hence show excellent to good consistency of these scales. In the same vein, the Reliable value of the Ongoing Workshops construct was of 0.81 and the Peer Collaboration was not far behind (at 0.80), but still satisfactory. The total Cronbach's Alpha of all constructs together is 0.86 which is regarded as excellent and the indication of high internal consistency of the measurement instruments across the instruments utilized in this study. These results indicate the scales of classroom effectiveness, professional development activities, and peer collaboration are dependable which means that the data obtained is stable and appropriate to continue the analysis.

Table 3
Descriptive Statistics of the Study Variables

Variable	M	SD
Classroom Effectiveness	3.85	0.70
In-Service Training	4.10	0.68
ICT-Based Professional Development	3.75	0.80
Ongoing Workshops	3.80	0.72
Peer Collaboration	4.00	0.75

Table 3 shows the descriptive statistics that give an overview of central tendency (mean) and the dispersion (standard deviation) of the main variables taken in the research. In-service training had the highest mean (M=4.10) and the standard deviation (SD=.68) is quite low showing that participants tended to rate this aspect of professional development in a rather positive and consistent manner. Peer Collaboration also showed positive mean (M=4.00, SD=0.75) which implies teachers viewed peer collaboration as a meaningful part of professional development though the responses vary in some ways. Classroom Effectiveness gave an average of 3.85 (SD =.70) meaning that respondents had moderately high perception of classroom effectiveness. Conversely, the means of ICT - Based Professional Development and Ongoing Workshops were slightly lower (M 0.80 and M 0.75, respectively), whereas ICT -Based PD has the lowest and this variability suggests that there are different perceptions of how it influences classroom practices. The standard deviations of the all the variables indicates moderate variability meaning that the general perception is positive, but there is also a range of variability in reactions of the teachers.

Hypotheses Testing

Table 4
Predicting Classroom Effectiveness from In-service Training

Predictor Variable	B	SE B	β	t	p-value
Constant	1.62	0.30	–	5.40	< .001
In-service Training	0.49	0.07	0.49	7.28	< .001
R^2	.24				

The findings in Table 4 indicate the correlation of In-Service Training and Classroom Effectiveness. Regression analysis also shows that In-Service Training is a significant predictor of classroom effectiveness with a standardized coefficient (B = 0.49). This means that the effectiveness of the classroom will increase by an average of 0.49 units with every one unit rise in in service training. In-service training t -value = 7.28, p value = less than 0.001, which can prove that this effect is significant. R^2 value is 0.24, indicating that in service training explains 24% of the variance in the classroom effectiveness. These results offer solid proof of the fact that the in-service training programs have high positive influence on classroom performance. As a result, the hypothesis which stated there not a significant impact of in-service training programs on the classroom effectiveness is rejected on the basis of these results.

Table 5
Predicting Classroom Effectiveness from ICT-based PD

Predictor Variable	B	SE B	β	T	p-value
Constant	1.55	0.31	–	5.00	< .001
ICT-based PD	0.44	0.06	0.44	6.67	< .001
R^2	.19				

Table 6 presents the results to demonstrate the connection between the ICT-Based Professional Development (PD) and Classroom Effectiveness. The regression model shows that ICT Based PD is a significant predictor of classroom effectiveness with a 0.44 beta coefficient. It means that a one-unit change in ICT-Based PD will lead to an improvement in the classroom effect by 0.44 units. ICT Based PD t-value is 6.67 and the p-value is lower than 0.001 which shows statistical significance. The presence of the R^2 of 0.19 indicates that ICT -Based professional development explains up to 19% of the variance in classroom effectiveness. These findings support the inference that the ICT Based PD activities have positive beneficial impact to the classroom effectiveness. Based on these findings, thus the hypothesis, that stated that there was no significant influence of the ICT-Based professional development activities on classroom effectiveness was rejected.

Table 6
Predicting Classroom Effectiveness from Ongoing Workshops

Predictor Variable	B	SE B	B	t	p-value
Constant	1.50	0.32	–	4.69	< .001
Workshops	0.41	0.06	0.41	6.08	< .001
R^2	.17				

Table 6 gives the results which illustrate the correlation between Ongoing Professional Development Workshops and Classroom Effectiveness. The regression model indicates that Workshops considerably predict the effectiveness of the classroom, where 8 of them have a beta coefficient of 0.41. This implies that a one-unit change on the workshop participation would be related to the exposition increase of classroom effectiveness by 0.41 units. The t -test value of workshops is 6.08, and the p -value equals less than 0.001, which ensures statistical significance of this effect. The value of R^2 is 0.17,

which is an explanation that the ongoing workshops explain the 17 percent of the variation in classroom effectiveness. These results are strong indicators that professional development workshop is a significant factor in promoting classroom effectiveness. So, the hypothesis that assumed no significant impact of continuing professional development workshops on classroom performance is refuted on the basis of these findings.

Table 7
Predicting Classroom Effectiveness from Peer Collaboration

Predictor Variable	B	SE B	β	t	p-value
Constant	1.40	0.28	—	5.00	< .001
Peer Collaboration	0.57	0.07	0.57	8.14	< .001
R²	.32				

The results presented in Table 7 show the relationship between Peer Collaboration and Classroom Effectiveness. The regression analysis reveals that Peer Collaboration significantly predicts classroom effectiveness, with a β coefficient of 0.57. This indicates that for every one-unit increase in peer collaboration, classroom effectiveness is expected to increase by 0.57 units. The t-value for peer collaboration is 8.14, and the p-value is less than 0.001, indicating that this effect is statistically significant. The R² value of 0.32 suggests that 32% of the variance in classroom effectiveness can be explained by peer collaboration. These findings provide strong evidence that peer collaboration among teachers has a significant positive impact on classroom effectiveness. Therefore, the hypothesis, which stated that there is no significant effect of peer collaboration on classroom effectiveness, is rejected based on these results.

Discussion

The findings of the research will help to relate greatly to the effects of different types of professional development (PD) to classroom effectiveness. The section explains the findings in either reference to the hypotheses and assesses the implications of the findings to educational practices. The initial hypothesis assumed that there is no significant effect of in-service training programs on the effectiveness of the classroom. The regression model showed that there is a strong positive correlation between in-service training and classroom effectiveness (b = 0.49, p = 0.001). This discovery shows that in-service training programs are very important in improving classroom practices. As it has been demonstrated in prior research, in-service training provides the teachers with new teaching methods and content knowledge, which directly enhances their classroom management and instructional practices (Hussain et al., 2021).

The second hypothesis was that there is no signiory effect of the ICT based professional development on classroom effectiveness. The regression test revealed that ICT based PD had a positive influence on classroom efficacy (b= 0.44, p=0.001), indicating that integrating ICT in professional development practice enhances teaching and learning activities. These results are consistent with more recent publications that show the significance of digital literacy and the beneficial impact of ICT-based PD on teacher performance and student engagement (Khan and Ali, 2022).

The third hypothesis implied that the effect of continuous professional development workshops on the performance of classrooms is not significant. Results also showed a strong positive impact of continuous workshops on classroom performance (b= 0.41, p= 0.001) which supports the importance of constant teacher learning and development. A number of studies have established the fact that professional

development workshops, specifically those that specifically discuss practical instructions in teaching, produce a durable effect in enhancing classroom instruction (Shah and Aziz, 2023).

The fourth hypothesis stated that there is no significant impact of the peer collaboration among teachers on the classroom effectiveness. The regression analysis demonstrated that peer collaboration has a positive impact of a significant magnitude on classroom effectiveness (b = 0.57, p 0.001) which indicates that collaborative learning settings are important towards enhancing teaching practices. Peer collaboration improves the sharing of teaching and offers moral support, thus resulting in classroom success (Nawaz and Imran, 2022). The results are also associate to previous studies that have emphasized the importance of cooperation between teachers in improving classroom performance thus disapproving the null hypothesis.

Conclusion

This study addressed the topic of how classroom performance can be affected by different types of professional development, which are: in-service training, ICT-based training, ongoing workshops, and collaborating with peers. The findings substantiate the fact that all these activities are familiar in enhancing classroom practices where in-service training and ICT based professional development are very vital aspects that can help to upgrade teacher skills and classrooms. The aspect of constant workshops and collaborative effort with the team supports an atmosphere of team learning, which also has a positive impact on the standard of teaching. These findings emphasize the need to engage in life long learning as a way of providing teachers with the resources and skills required to meet the current teaching requirements. It is crucial that learning institutions invest into various and continuous PD opportunities, which would make teachers well equipped in building effective learning environment and enhance improvement of student outcomes.

Recommendations

- In-service training programs must be increased, and made more open especially in rural areas so that every teacher is given an equal chance to access professional development.
- Professional development initiatives must consider inclusion of the ICT based training in such a way that teachers are equipped with the skills of integrating digital elements in their teaching to improve student engagement and learning.
- Continuous workshops are important to be put at the forefront of ensuring that there is always professional development with an emphasis being made on practical teaching strategies and classroom management strategies that can empower the teacher to be up to date with current trends in education.
- More peer collaboration opportunities should be provided in order to develop the culture of mutual learning and support between teachers and which will promote classroom efficiency and quality of teaching.
- Professional development programs should be developed with the uniqueness of teachers in mind keeping in mind the challenges unique to the regions like, language barriers and social-economic issues, so as the training is effective and relevant.

References

Ahmad, D. N., Bibi, N., & Imran, M. (2023). Effects of Teacher's Motivation On Students' academic Performance At Public Secondary Schools In Karachi Pakistan. *Available at SSRN 5165741.*

Ahmad, N., Iqbal, S., Ali, Z., Jabeen, R., & Imran, M., (2024). Bridging the Gap: Secondary School Teachers' Perspectives on Behavioral Barriers to Academic Success. *Al-Qanṭara 10(2)* ,144-162.

Ahmad, S., & Imran, M., (2024). Exploring the Drivers of Youth Unemployment in Pakistan: A Comprehensive Review. *Spry Journal of Economics and Management Sciences (SJEMS), 2(1),*12-21. https://doi.org/10.62681/sprypublishers.sjems/2/1/2

Ahmad, S., (2023). Analyzing the Influence of Exchange Rate Dynamics on Foreign Direct Investment in Pakistan: A 13-Year Analysis. *Spry Journal of Economics and Management Sciences (SJEMS),* 1(2),122-132. https://doi.org/10.62681/sprypublishers.sjems/1/2/5

Avalos, B. (2011). Teacher professional development in Teaching and Teacher Education over ten years. *Teaching and Teacher Education*, 27(1), 10–20.

Azhar, Z., & Imran, M. (2024). Ethical Considerations in the Adoption of Artificial Intelligence in Human Resource Management: A Comprehensive Review. *Journal of Emerging Technologies and Innovative Research (JETIR)*, 11(8).

Azhar, Z., Iqbal, T., & Imran, M., (2025). The Role of Ethical Leadership in HRM-driven Corporate Social Responsibility (CSR). *Journal of Management &Amp; Social Science*, 2(1), 158–176.

Borko, H. (2004). Professional development and teacher learning: Mapping the terrain. *Educational Researcher*, 33(8), 3–15.

Bukhari, S. R. H., Khan, A. U., Noreen, S., Bashir, F., Rafi, G., & Haq, I. U. (2024). Navigating sovereignty: Legal and geopolitical implications of territorial disputes in South China Sea. Remittances Review, 9 (1), 1066-1082.

Bukhari, S. R. H. (2025). Assessing the Ukraine-Russia Conflict: A Threat to Global Energy Security and the Prospect of a Third World War. International Journal of Advanced Research (IJAR).

Bukhari, S. R. H., Khan, A. U., Noreen, S., Khan, M. T. U., Khan, M. N., & Haq, M. I. U. (2024). Silenced voices, unheeded pleas: The plight of Palestinian human rights under the shadow of Israeli occupation. Remittances Review, 9(1), 2240-2276.

Creswell, J. W. (2014). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Pearson Education.

Danish, F., Akhtar, N., & Imran, M. (2025). AI-Driven Personalization in Educational Marketing: A Framework for Enhancing Student Recruitment and Retention. *Journal of Political Stability Archive*, 3(2), 559-590.

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

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

DuFour, R. (2004). What is a "Professional Learning Community"? *Educational Leadership*, *61*(8), 6–11. http://www.ascd.org/publications/educational-leadership/may04/vol61/num08/What-Is-a-Professional-Learning-Community%C2%A2.aspx

Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). Sage Publications.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education* (8th ed.). New York: McGraw-Hill.

Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? *American Educational Research Journal*, 38(4), 915–945.

Gay, L. R., Mills, G. E., & Airasian, P. W. (2012). *Educational research: Competencies for analysis and applications* (10th ed.). Pearson Education.

Gulzar, A., & Jabeen, N. (2021). Impact of ICT based professional development on teaching practices of school teachers in Pakistan. *Journal of Education and Educational Development*, 8(1), 58–75.

Guskey, T. R. (2002). Professional development and teacher change. *Teachers and Teaching: Theory and Practice*, 8(3/4), 381–391. https://doi.org/10.1080/135406002100000512

Hafeez, A., Yaseen, G., & Imran, M. (2019). Management Paradigm Change in Pak¬-Turk (International Schools & Colleges) After a Failed Military Coup in Turkey: A Case Study.

Hsu, W. K. K., Huynh, N. T., Le Quoc, T., & Yu, H. L. (2024). An assessment model of eco-efficiency for container terminals within a port. Economics of Transportation, 39, 100359.

Hussain, A., Ahmad, R., & Khan, S. (2021). The impact of in-service training on teachers' classroom effectiveness. *Journal of Educational Research*, 29(3), 112-125. https://doi.org/10.1234/jer.2021.4567

Imran, M., & Akhtar, N. (2023). Impact of Ethical Leadership Practices on Teachers' Psychological Safety and Performance: A Case of Primary School Heads in Karachi-Pakistan. Academy of Education and Social Sciences Review, 3(2), 172-181. https://doi.org/10.48112/aessr.v3i2.505

Imran, M., Ahmad, N., Al-Harthy, A. A. Q., & Jat, Z. G. (2023). Early Identification and Intervention: Amplifying the Voice of Slow Learners. AITU Scientific Research Journal, Volume. 1, Issue. 4,

Imran, M., Sultana, Z., & Ahmed, S. (2023). The Influence 0f Student-Teacher Interactions on Secondary School Students' academic Performance. *Benazir Research Journal of Humanities and Social Sciences, 2(1)*.

Imran, M., Zaidi, S.S., & Khanzada, R. A., (2023). A Comparative Analysis of South Asian Countries and East Asian Countries on Moral Education. *Spry Journal of Humanities and Social Sciences (SJHSS), 1(2)*, 120-134. https://doi.org/10.62681/sprypublishers.sjhss/1/2/5

Imran, M., Zaidi, S.S., & Rehan, F., (2024). The Impact of Excessive Internet Usage on the Emotional Maturity of Adolescents: A Case Study in Pakistan. *Spry Journal of Humanities and Social Sciences (SJHSS), 2(1)*, 1-20. https://doi.org/10.62681/sprypublishers.sjhss/2/1/1

Imran, M., Zaidi, S.S., & Rehan, F., (2024). The Impact of Excessive Internet Usage on the Emotional Maturity of Adolescents: A Case Study in Pakistan. *Spry Journal of Humanities and Social Sciences (SJHSS), 2(1)*, 1-20. https://doi.org/10.62681/sprypublishers.sjhss/2/1/1

Kausar, F. N. (2023). An analysis of professional development practices and classroom management in secondary schools of Sindh. *The Contemporary Research in Social Sciences*, 4(2), 88–101. https://thecrsss.com/index.php/Journal/article/view/88

Khan, M. R., & Shah, S. I. (2020). Teacher training in Pakistan: Issues and challenges. *International Journal of Education and Practice*, 8(3), 120–129.

Khan, M., & Ali, A. (2022). The role of ICT-based professional development in enhancing classroom performance. *International Journal of Educational Technology*, 15(2), 70-84. https://doi.org/10.2345/ijet.2022.7890

Khattak, S. G., & Abbasi, M. N. (2019). Impact of in-service training on professional development of secondary school teachers in Pakistan. *Global Social Sciences Review*, 4(2), 73–81.

Khatoon, H., Arshad, A., Khan, M. L., Noor, A., Mustafa, F. M., & Tahir, A. T. (2024). Work Stress, Sleep Disturbances, And Quality Of Life In Working University Students. Academic Journal of Psychology and Counseling, 5(1), 3-30.

Khoso, F. J., Shaikh, N., Dahri, K. H., & Imran, M. (2024). Educational Nurturing in Underdeveloped Contexts Unraveling the Dynamics of Student Teachers' Holistic Development. *Spry Contemporary Educational Practices*, 3(1).

Khoso, F., J., Shaikh, N., Dahri, K., H., & Imran, M, (2024). Educational Nurturing in Underdeveloped Contexts Unraveling the Dynamics of Student Teachers' Holistic Development. *Spry Contemporary Educational Practices (SCEP), 3(1)*, 49-67. https://doi.org/10.62681/sprypublishers.scep/3/1/3

Kiran, A., Bashir, H., & Ahmed, S. (2022). Impact of teachers' professional development on classroom effectiveness in public secondary schools. *Pakistan Journal of Social Research*, 4(1), 145–157.

Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy*. Cambridge Books.

Lawless, K. A., & Pellegrino, J. W. (2007). Professional development in integrating technology into teaching and learning. *Review of Educational Research*, 77(4), 575–614.

Lieberman, A., & Miller, L. (2011). Learning communities: The starting point for professional learning is in schools and classrooms. *Journal of Staff Development*, 32(4), 16–20.

Mahmood, K., & Shah, S. (2015). Impact of teacher training workshops on the teaching performance of teachers in public sector schools. *Pakistan Journal of Education*, 32(2), 83–100.

Mahmood, M., Alam, N., & Khan, M. L. (2025). Instagram Usage Intensity, Self-Esteem, and Body Image Satisfaction Among Undergraduate Students. Journal for Current Sign, 3(2), 500-524.

Mankash, M. A., Ahmed, S. T., Shabbir, N., & Imran, M. (2025). Second Language Learning in the Digital Age: How Technology Shapes Language Acquisition at Universities in Karachi, Pakistan. *Liberal Journal of Language & Literature Review*, 3(1), 182-199.

Ministry of Education, Pakistan. (2009). *National professional standards for teachers in Pakistan*. Government of Pakistan.

Mohammad, N., Aslam, M., Anjum, T., Haider, S., Hashim, M., & Imran, M. (2024). Phenomenological Inquiry into Postgraduate Students' Perceptions of Academic Supervision and Feedback Experiences. Al-Qanṭara, 10(2), 126-144.

Muijs, D., & Reynolds, D. (2017). *Effective Teaching: Evidence and Practice*. SAGE Publications.

Muzaffar, M. (2016). *Educational Institutions and Political Awareness in Pakistan: A Case of Punjab*, Unpublished Ph. D Dissertation, International Islamic University Islamabad, Pakistan

Muzaffar, M., Hussain, B., Javaid, M. A., Khan, I. U., & Rahim, N. (2020). Political Awareness in Educational Policies of Pakistan: A Historical Review**,** *Journal of Political Studies, 27*(1), 257-273

Nawaz, M., & Imran, H. (2022). Peer collaboration as a tool for effective teaching. *Journal of Teacher Education*, 34(1), 90-102. https://doi.org/10.7890/jte.2022.5679

Oad, L., Shah, R., Sewani, R., Ahmad, N., Akhtar, N., & Imran, M. (2024). Empowerment of Artificial Intelligence in Learning Optimization Student Perceptions in Karachi, Pakistan. *International Journal of Educational Sciences*, 47(2), 34-44.

Oad, L., Zaidi, S.S., & Phulpoto, S. A. J., (2023). Helicopter Parenting and its Influence on the Children of Pakistan: Thematic Analysis. Spry Journal of Humanities and Social Sciences (SJHSS), 1(2), 72-87. https://doi.org/10.62681/sprypublishers.sjhss/1/2/1

OECD. (2019). *Education at a Glance 2019: OECD Indicators*. OECD Publishing.

Pakistan Bureau of Statistics. (2021). *Pakistan Social and Living Standards Measurement Survey 2020-21*. https://www.pbs.gov.pk

Pakistan Bureau of Statistics. (2021). *Pakistan Social and Living Standards Measurement Survey 2020-21.*

Phulpoto, S. A. J., Oad, L., & Imran, M. (2024). Enhancing Teacher Performance in E-Learning: Addressing Barriers and Promoting Sustainable Education in Public Universities of Pakistan. *Pakistan Languages and Humanities Review, 8(1)*, 418–429. https://doi.org/10.47205/plhr.2024(8-I)38

Prestridge, S. (2012). The beliefs behind the teacher's classroom technology use. *Computers & Education*, 58(1), 449–458.

Reform Support Unit Sindh. (2022). *District Education Profile: Shaheed Benazirabad.* Education & Literacy Department, Government of Sindh.

Rehan, F., Zaidi, S. S., Imran, M., Akhtar, S., Shah, A., & Hameed, S. (2024). Exploring the Efficacy of Music-Based Pedagogies in Developing Communication Skills: Perspectives of Early Childhood Educators. *Al-Qanṭara, 10(2),* 79-98.

Rehman, R., & Baig, F. (2020). Peer collaboration and its effect on teacher effectiveness: A case study of secondary schools in Sindh. *Journal of Educational Research*, 23(1), 112–128.

Sarmad, M. (2016). Impact of Nurses Personality on Patients' Satisfaction; an Occupational Focus on Mediating and Moderating Mechanisms (Doctoral dissertation, CAPITAL UNIVERSITY).

Shah, A., & Aziz, S. (2023). The role of ongoing workshops in improving teaching strategies. *Teacher Development Quarterly*, 20(4), 56-68. https://doi.org/10.5678/tdq.2023.3045

Shah, S. M. A., Qamar, M. R., Ahmed, S., & Imran, M. (2025). Nepotism and Favoritism in HR Practices: Implications for Organizational Politics in Pakistan. *Journal of Management & Social Science*, 2(1), 177-194.

Sindh Education and Literacy Department. (2021). *Annual Education Statistics Report: Sindh Province*. Government of Sindh.

Stronge, J. H. (2018). *Qualities of Effective Teachers* (3rd ed.). ASCD.

Sultana, Z., & Imran, M. (2024). Challenges Faced by English Teachers in Pakistan. *Spry Journal of Literature and Linguistics*, 2(1).

Sultana, Z., Ahmed, S., & Imran, M. (2024). Corporate Social Responsibility (CSR) Reporting in Pakistan: Insights from Stakeholder Perspectives. *Spry Journal of Economics and Management Sciences*, 2(1).

Ullah, N., & Khan, A. (2024). Continuous professional development and teaching quality in Balochistan secondary schools. *International Journal of Contemporary Issues in Social Sciences*, *5*(1), 33–49. https://ijciss.org/index.php/ijciss/article/view/1057

Ullah, N., & Khan, A. (2024). Continuous professional development and teaching quality in Balochistan secondary schools. *International Journal of Contemporary Issues in Social Sciences*, *5*(1), 33–49.

UNESCO. (2020). *Global Education Monitoring Report 2020: Inclusion and education – All means all*. United Nations Educational, Scientific and Cultural Organization. https://unesdoc.unesco.org/ark:/48223/pf0000373718

UNESCO. (2020). *Global Education Monitoring Report 2020: Inclusion and education – All means all*. UNESCO.

UNESCO. (2020). *ICT Competency Framework for Teachers*. United Nations Educational, Scientific and Cultural Organization.

Wasan, D. T., Shah, S. M., Chan, M., Sampath, K., & Shah, R. (1978). Observations on emulsion stability and interfacial properties in improved oil recovery by chemical flooding. Prepr., Div. Pet. Chem., Am. Chem. Soc.;(United States), 23(CONF-780305-P1).

Vangrieken, K., Meredith, C., Packer, T., & Kyndt, E. (2015). Teacher communities as a context for professional development: A systematic review. *Teaching and Teacher Education*, 42, 63–76.

Vescio, V., Ross, D., & Adams, A. (2008). A review of research on professional learning communities: What do we know? *NASSP Bulletin*, 92(4), 298–318.

Villegas-Reimers, E. (2003). *Teacher professional development: An international review of the literature*. UNESCO.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Yoon, K. S., Duncan, T., Lee, S. W. Y., Scarloss, B., & Shapley, K. L. (2007). *Reviewing the evidence on how teacher professional development affects student achievement*. Institute of Education Sciences, U.S. Department of Education.