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Effect of principal's instructional leadership practices on teachers' professional development: A cross sectional study of secondary school level from selected areas of Lahore, Punjab, Pakistan

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Abstract

This study investigates the intricate relationship between principal instructional leadership practices and their effects on teacher professional development, school culture, and the broader educational environment. The research was conducted in selected areas of Lahore, involving 260 participants from both private and public secondary schools. Data was collected through a Likert scale questionnaire containing 25 items measuring seven dimensions of instructional leadership and 11 items for teacher professional development. Statistical analysis, including Cronbach's Alpha, KMO and Bartlett's tests, factor analysis, Pearson correlation, and regression analysis, were employed to examine the data. The research revealed significant associations between principal instructional leadership practices and teacher professional development, highlighting the influence of instructional leadership behaviors such as providing feedback, setting clear educational objectives, and fostering collaborative learning environments. This study identified a substantial impact of principal instructional leadership on school culture and organizational environment, with instructional leadership practices positively correlating with welcoming environments and a culture of continuous improvement. The findings of this study have practical implications for educational officials and practitioners. Educational leadership development initiatives that focus on enhancing instructional leadership skills among administrators can create conditions conducive to effective teacher professional development. These initiatives should prioritize fostering cooperation, providing constructive feedback, and establishing clear instructional objectives. This research underscores the vital role of instructional leadership in shaping school culture and student outcomes. Effective educational leadership is an ongoing process that encourages trust, collaboration, and adaptability in a rapidly evolving educational landscape. While acknowledging the study's limitations, this research contributes to the ongoing dialogue on educational leadership, emphasizing its significance in promoting successful school communities.

Keywords: Instructional Leadership; Teacher Professional Development; School Culture; School Environment; Educational Leadership; Principals

1. Introduction

In the field of education, teachers play a crucial role in shaping the future of our society (Kennedy, 2016; Whitworth & Chiu, 2015). They are responsible for imparting knowledge, fostering critical thinking skills, and inspiring a love for learning in their students (DeMonte, 2013; Bayar, 2014; Yoo, 2016). However, in order to effectively carry out their responsibilities, teachers need continuous professional development (Lunenberg et al., 2014). Professional development programs help teachers enhance their instructional practices, stay updated with the latest educational trends, and effective student outcomes (Meissel et al., 2016; Kennedy, 2016; DESIMONE & GARET, 2015). In this dynamic educational landscape, principals serve as key facilitators and instructional leaders, supporting teachers in

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their professional growth and driving positive change in schools (Dixon et al., 2014; Whitworth & Chiu, 2015; Körkkö et al., 2016).

Professional development for teachers encompasses a range of activities and initiatives aimed at enhancing their skills, knowledge, and instructional strategies (Evans, 2014; Girvan et al., 2016). It is an ongoing process that enables teachers to familiarize themselves with the evolving needs of their students and the changing educational landscape (Vangrieken et al., 2017). Effective professional development programs offer teachers with prospects to cooperate, reflect, and engage in meaningful learning experiences (Darling-Hammond et al., 2017; Evans, 2014; Meissel et al., 2016).

The role of professional development equips teachers with the necessary tools and strategies to meet the diverse needs of their students, address learning gaps, and employ innovative instructional methods (Voogt et al., 2015; Gaudin & Chaliès, 2015). It fosters a culture of lifelong learning among educators, enabling them to stay updated with research-based best practices and pedagogical approaches (Stewart, 2014; Kennedy, 2014; Hudson, 2013). By investing in professional development, schools and districts invest in the continuous improvement of their instructional practices, leading to upgraded student attainment and overall school success (Noom-ura, 2013; Ekanayake & Wishart, 2014).

Principals are educational leaders who play a pivotal role in generating a conducive environment for teachers' professional growth (Baran & Correia, 2014; Asterhan, 2015). They are responsible for developing and implementing a school-wide vision that aligns with the goals of student achievement and instructional excellence (Olsen, 2015; Richter et al., 2014; Nadelson et al., 2013). Principals establish a positive and supportive culture within the school, emphasizing the importance of professional development and creating opportunities for collaboration among teachers (Gore et al., 2017; Allen & Penuel, 2014; Darling-Hammond et al., 2017).

As instructional leaders, principals provide guidance and support to teachers in their pursuit of professional growth (Golombek & Doran, 2014; Kyndt et al., 2016). They facilitate admittance to relevant resources, encourage contribution to professional development programs, and foster a value of unceasing learning (Meissel et al., 2016; Nadelson et al., 2013). Principals actively engage with teachers, observing their instructional practices, providing constructive feedback, and identifying areas for improvement (Rienties et al., 2013). By promoting a growth mindset, principals inspire teachers to embrace new challenges, take risks, and seek opportunities for innovation (Shernoff et al., 2017; DiPaola & Wagner, 2018).

Furthermore, principals serve as advocates for teachers' professional development at the school and district levels (Desimone & Pak, 2016; Fishman et al., 2013). They collaborate with district administrators to allocate resources and design professional development initiatives that align with the specific needs of their school community (Waitoller & Artiles, 2013; Burke, 2013). Principals also establish partnerships with external organizations, universities, and experts in the field to bring in specialized training and expertise for their teachers (DiPaola & Hoy, 2013; Avidov-Ungar, 2016).

Within the realm of instructional leadership, principals assume the function of instructional leaders, guiding teachers in the implementation of effective instructional practices (Ng et al., 2015; Rigby, 2013; Bush, 2013). They work closely with teachers to set goals, monitor progress, and provide support in designing and delivering high-quality instruction (Neumerski, 2012; Mngo & Mngo, 2018). Instructional leaders facilitate professional learning communities (PLCs) where educators cooperate, share best practices, and engage in meaningful discussions about student learning (Olsen, 2015; Shernoff et al., 2017; Brazer & Bauer, 2013). In their role as instructional leaders, principals focus on building teachers' capacity to improve student attainment (Sebastian et al., 2018; Ismail et al., 2018). They analyze data, identify areas of instructional improvement, and provide targeted professional development opportunities to address those needs (Zepeda, 2013; Ross & Cozzens, 2016). Instructional leaders stay informed about the latest educational research and evidence-based instructional strategies, ensuring that teachers have admittance to the most informed information and resources (Kwan, 2019; Zheng et al., 2018; Le Fevre & Robinson, 2014).

Moreover, instructional leaders foster a culture of reflection and self-assessment among educators (Hallinger et al., 2016; Özdemir et al., 2020). They encourage teachers to analyze their instructional practices, reflect on their effectiveness, and make adjustments based on student outcomes (Gurley et al., 2016; Carraway & Young, 2015). By promoting a cycle of continuous improvement, instructional leaders empower teachers to take possession of their professional growth and make informed choices about their instructional practices (Liu & Hallinger, 2018; Park & Ham, 2014).

Facilitating professional development opportunities for teachers is a pivotal aspect of instructional leadership (Daniëls et al., 2019; Neumerski, 2012). There are various ways in which this can be accomplished, ranging from enabling entry to external training programs to organizing internal workshops and seminars (Grissom et al., 2013; Goddard et al.,

2015). Offering educators with chances to broaden their expertise and understanding not only amplifies their pedagogical proficiency but also showcases a principal's dedication to ongoing instruction and growth, which has the probability to elevate teacher morale and drive (Day et al., 2016; Day et al., 2020; Desimone & Garet, 2015).

In order to uphold an institute's high level of performance, it is imperative for instructional leaders to create a clear visualization and purposes for their institute and to proficiently convey and distribute them among their faculty (Klar et al., 2019; Shatzer et al., 2013; Anderson, 2017). Teachers who possess a clear comprehension of the school's objectives and are in pact with them are more inclined to exhibit proficient performance and make valuable contributions towards the attainment of the school's accomplishment (Darling-Hammond et al., 2017; Evans, 2014; Meissel et al., 2016).

The role of principals as instructional leaders is of critical importance in shaping the professional development of teachers at the secondary school level (Whitworth & Chiu, 2015; Waitoller & Artiles, 2013). As educational leaders, principals have the authority to impact the instructional practices and professional growth of their teaching staff (Dematthews, 2014; Moss & Brookhart, 2019). Comprehending the effects of principals' instructional leadership functions on teachers' professional development is crucial for fostering a culture of continuous learning, improving instructional quality, and ultimately enhancing student outcomes (Nancy|Grigsby, 2015; Zepeda, 2016).

Firstly, research has shown that effective instructional leadership practices positively impact educators' professional development (Cordingley et al., 2015; Bayar, 2014). This study aims to investigate the explicit instructional leadership practices employed by principals and how these practices influence teachers' professional development (Earley & Porritt, 2013). At the secondary level, teachers often specialize in specific subject areas, and their professional development needs may vary based on these specialized fields (Wilson, 2013; Zheng et al., 2018).

Principals must have a deep comprehension of the diverse professional learning needs of their teaching staff and tailor their instructional leadership practices accordingly (Zepeda, 2014; Bush, 2013; Carraway & Young, 2015). This study seeks to discover how principals discourse the diverse professional development requirements of teachers in secondary schools and the impact of their practices on teacher growth and student outcomes (Voogt et al., 2015; Gaudin & Chaliès, 2015). This study investigates the role of principals in fostering collaboration and the influence of collaborative professional development practices on teachers' instructional efficiency (Olsen, 2015; Richter et al., 2014; Nadelson et al., 2013).

The prevailing literature on the impact of principals' instructional leadership on teachers' professional development reveals several notable research gaps (Goddard et al., 2015; Gore et al., 2017). There is an inadequate focus on the secondary school level, with most studies concentrating primarily on elementary schools (Day et al., 2020; Evans, 2014). This highlights the need for research specifically targeting the exclusive setting of secondary schools and exploring how principals' instructional leadership practices influence professional development in this setting (Fishman et al., 2013; Day et al., 2016). Additionally, the influence of contextual factors, such as school extent, location, student demographics, and resources, on the association between instructional leadership and professional development has received insufficient attention (DeMonte, 2013; DiPaola & Hoy, 2013; Klar et al., 2019). Understanding the interaction between these contextual factors and instructional leadership practices is crucial for tailoring effective professional development strategies (Neumerski, 2012; Mngo & Mngo, 2018).

Additionally, the role of collaborative professional development, such as PLCs, and its impact on instructional practices and teacher growth requires further investigation (Shatzer et al., 2013; Kouali, 2017). In addition, there is a need to establish a stronger link between principals' instructional leadership practices, educators' professional development, and student consequences (Kyndt et al., 2016). Understanding how instructional leadership indirectly impacts student achievement through its influence on teacher development is essential for comprehensive school improvement efforts (Waitoller & Artiles, 2013; Burke, 2013). Addressing these research gaps contributes to a profound comprehension of the role of principals' instructional leadership practices in shaping teachers' professional development and ultimately enhancing educational consequences at the secondary school level (Nancy|Grigsby, 2015; Rienties et al., 2013)

The study aimed to examine the impact of principals' instructional leadership practices on teachers' professional development at the secondary school level (Whitworth & Chiu, 2015; Harris et al., 2013). The study aims to investigate how principals' instructional leadership practices influence the professional growth and development of teachers in secondary schools (Ullah & Scholar, 2020). This objective seeks to identify specific leadership behaviors, strategies, and approaches utilized by principals in promoting and supporting teacher growth and development (Uddin et al., 2020; Karacabey, 2020). By examining the instructional leadership practices employed by principals, the study aims to gain

insights into the ways in which principals guide and provide opportunities for teachers to enhance their instructional services and acquaintance (Daniëls et al., 2019; Neumerski, 2012; Lunenberg et al., 2014).

2. Literature Review

2.1. The Role and Impact of Instructional Leadership in Educational Settings

Instructional leadership, as a concept, has significantly evolved over the past decades (Leithwood et al., 2020; Hallinger, 2018; Khalifa et al., 2016). Hallinger & Murphy (1985) were among the first to outline this role, describing instructional leaders as principals who focus on the coordination, control, and improvement of teaching and learning (Grissom et al., 2013; Hallinger & Wen-Chung Wang, 2015). This involved characterizing the school undertaking, handling the instructional program, and endorsing an optimistic learning climate (Khan et al., 2020). Over time, a more holistic interpretation of instructional leadership has emerged, encompassing not only the principal's actions unswervingly related to teaching and learning but also the activities that indirectly support this process (Klar et al., 2019; Özdemir et al., 2020; Richter et al., 2014). This includes facilitating professional development, fostering a collaborative culture, and enabling teachers to become leaders themselves (Mavrogordato & White, 2019; Shernoff et al., 2017).

Several studies indicated that instructional leadership specifically was found to account for about a quarter of total school effects on students' academic performance (Ahmad, 2021; Li et al., 2023). Five leadership extents were acknowledged: creating goals and prospects; deliberate resourcing; preparation, coordinative, and assessing teaching and the curriculum; endorsing and partaking in teacher learning and development; and confirming an arranged and helpful environment (Liu & Hallinger, 2018; Lunenberg et al., 2014). Among these, the most substantial impact was from the principal's participation in professional development and learning, underscoring the importance of the principal as a 'lead learner' in the school community (Jelena Veletić et al., 2023; Mydin et al., 2022).

The research highlighted the principal's role in fostering a data-driven culture in schools, another aspect of instructional leadership (Kim & Lee, 2019; Binti et al., 2020). In addition, principals who actively used data to inform instruction and decision-making were found to have a more significant influence on teachers' practice and student achievement (Jay & Aureada, 2021; Mcbrayer et al., 2020). Meanwhile, research by Mydin et al. (2022) found that successful instructional leaders adapt their leadership to the changing needs and capacities of their schools. This is congruent with the contingency theory, suggesting the effectiveness of leadership practices depends on the context (Ross & Cozzens, 2016; Shatzer et al., 2013; Zepeda, 2013).

The association between instructional leadership and teacher job contentment is another essential facet (Yoo, 2016; Whitworth & Chiu, 2015). In addition, the research discovered that principals' instructional leadership behaviors completely impact teachers' job fulfillment, which in turn can impact overall school enactment (Toropova et al., 2020; Aydin et al., 2013).

One such instructional leadership model was proposed by Neumerski (2012), who advocated for an "assisted leadership" framework (Binti et al., 2020; Bush, 2013; Carraway & Young, 2015). In this model, principals rely on a network of actors to lead instruction, and their role centers on leveraging this network to strengthen instructional improvement (Goddard et al., 2015; Gurley et al., 2016). Hallinger & Wen-Chung Wang (2015) focused their research on the principals' role in teacher development, reporting that effective principals encouraged reflective dialogue, provided constructive feedback, and actively supported teacher collaboration. This, in turn, led to improved teacher instructional strategies, increased student engagement, and improved student learning Dematthews, 2014; Moss & Brookhart, 2019).

As for the principal's role in fostering a positive school environment, studies have shown that principals can significantly influence the school's atmosphere (Aldridge & Fraser, 2015; Arifin, 2015). A study by Urick & Bowers (2014) suggested that instructional leadership practices strongly correlated with a positive school environment (Zepeda, 2014; Sebastian et al., 2018). Their findings implied that through the growth of communal visualization, the promotion of instructional feedback, and the creation of a culture of continuous learning, principals can contribute to an environment conducive to learning (Park & Ham, 2014; Nadelson et al., 2013; Liu & Hallinger, 2018). Moreover, in the face of the 21st-century digital shift, the role of instructional leaders in implementing technology in the classroom and the influence of this on school outcomes is another intriguing area for further research (Golombek & Doran, 2014; Kyndt et al., 2016).

2.2. Principals' Instructional Leadership Practices and Teacher Professional Development

The development of teachers' professional capacities is central to the role of principals as instructional leaders (Neumerski, 2012; Mydin et al., 2022; Kouali, 2017). This concept of teacher professional development goes beyond initial teacher training and encompasses a lifelong, systematic, and planned process of improving teaching and learning practices (Shernoff et al., 2017; DiPaola & Wagner, 2018). In this context, the role of the principal as an instructional leader comes to the fore. Fullan (2013) posited that the principal, as the lead learner, creates the conditions necessary for teachers to be involved in continual learning and development. Their role encompasses creating a culture of collaboration, facilitating access to professional development opportunities, and providing constructive feedback to teachers (Baran & Correia, 2014; Asterhan, 2015; Jay & Aureada, 2021).

Several studies highlight the principal's leadership practices have a significant impact on teachers' professional development (Avidov-Ungar, 2016; Merritt, 2021). For instance, studies found that when principals engaged in shared instructional leadership, it led to an enriched teacher-professional community, which, in turn, fostered improved classroom instruction (Allen & Penuel, 2014; Bayar, 2014; DeMonte, 2013). This signifies the potential of a collaborative environment to enhance teacher skills and instructional quality (Wilson, 2013; Zheng et al., 2018; Dixon et al., 2014).

In a similar vein, previous research proposed that the support and encouragement from principals motivate teachers to participate in professional development (Girvan et al., 2016; Hudson, 2013; Kennedy, 2016). This finding emphasizes the principal's role as an enabler and advocate of teacher learning. A study by Körkkö et al. (2016) delved into the ways principals contribute to teachers' professional development. They found that two types of principal behaviors were essential: directly involving themselves in professional development activities and encouraging teachers to take part in school decision-making. The former affirms the principal's role as the lead learner, while the latter underlines the importance of giving teachers a voice in the process, thereby promoting a sense of agency and engagement (Li et al., 2023; Maponya, 2020; Mngo & Mngo, 2018).

The studies found that principals who regularly visited classrooms and provided feedback were more likely to encourage teacher development, emphasizing the significance of principals being visible and engaged in the school environment (Mogren & Gericke, 2016; Körkkö et al., 2016; Harris et al., 2013). The intersection of instructional leadership and teacher professional development has also seen the emergence of 'distributed leadership models' (Avidov-Ungar, 2016; Aydin et al., 2013). According to these models, leadership responsibilities are shared among multiple staff members, providing a robust support system for teachers' professional development (Binti et al., 2020; Darling-Hammond et al., 2017). However, the principal still plays a crucial role in enabling and coordinating this shared leadership (Day et al., 2016; Dematthews, 2014; Desimone & Pak, 2016).

Studies highlighted that principals play a crucial role in giving teachers access to high-quality professional development opportunities (Fishman et al., 2013; Gore et al., 2017; Baran & Correia, 2014). This includes external workshops, in-service training, and conferences, as well as promoting collaboration and knowledge sharing within the school (Ahmad, 2021; DiPaola & Wagner, 2018; Ng et al., 2015).

The practice of a principal's collaborative leadership significantly influences teachers' professional development (Allen & Penuel, 2014; Bayar, 2014; DeMonte, 2013). The studies found that a culture of collaboration facilitated by the principal leads to shared learning, increased job satisfaction, and the enhancement of teaching practices (Burke, 2013; Earley & Porritt, 2013; Karacabey, 2020). By creating an environment that encourages teamwork and shared problem-solving, principals can foster a sense of communal responsibility for student success, thus contributing to the continual professional growth of teachers (Lunenberg et al., 2014; Meissel et al., 2016; Nadelson et al., 2013).

The principal's role as a mentor also plays a significant part in teacher development. A study by Noom-ura (2013) found that principals who offered guidance, support, and constructive feedback to teachers positively influenced their professional growth and instructional quality (Stewart, 2014; Waitoller & Artiles, 2013). The concept of 'instructional coaching in which the principal or a designated instructional leader provides one-on-one teaching feedback, is also gaining traction. A meta-analysis by Kraft, Blazar, and Hogan (2018) found that instructional coaching significantly improved both teachers' instructional practice and students' academic achievement (Bahtilla & Hui, 2020; DiPaola & Wagner, 2018). Principals, as instructional leaders, play a critical role in implementing and supporting such initiatives (Yoo, 2016; Wilson, 2013; Bahtilla & Hui, 2020).

The role of the principal in modeling lifelong learning and maintaining a growth mindset is another aspect that positively contributes to teachers' performance (Kwame Gyamerah, 2020; Tedla & Kilango, n.d.). By engaging in their professional development, principals can serve as role models for continuous learning and growth (Zepeda, 2013; Zheng

et al., 2018; Khan et al., 2020). In an increasingly digitized world, principals play a crucial role in supporting digital competencies, and pedagogical innovation is becoming critical (Schrum & Levin, 2013; Kwame Gyamerah, 2020; Gurley et al., 2016).

2.3. Challenges and Opportunities in Promoting Teachers' Professional Development through Instructional Leadership

The promotion of teacher professional development through instructional leadership brings with it a multitude of challenges and opportunities.

2.4. Challenges

Diverse Needs of Teachers: One of the principal challenges, as Darling-Hammond et al. (2017) have noted, is addressing the diverse professional development needs of teachers (Saleem, 2020; Day et al., 2016). In any school, teachers come with varying backgrounds, experiences, and instructional competencies, necessitating a differentiated approach to professional development (Evans, 2014; Goddard et al., 2015; Harris et al., 2013). Implementing a one-size-fits-all approach can lead to a misalignment between the professional development offered and the specific needs of the teachers, thereby hindering the effectiveness of the growth process (Kwame Gyamerah, 2020; Maponya, 2020).

Resource Constraints: Additionally, resource constraints pose a significant challenge for instructional leaders (Merritt, 2021; Olsen, 2015; Park & Ham, 2014). As suggested by Ross & Cozzens (2016), time and financial resources are critical for effective professional development. However, many schools, especially those in economically disadvantaged areas, contend with budgetary constraints that limit their ability to provide quality professional development opportunities. This challenge calls for creative approaches and efficient use of available resources (Zepeda, 2014; Aldridge & Fraser, 2015; Arifin, 2015).

Creating a Collaborative Culture: The studies indicated that the task of fostering a collaborative culture also has its hurdles. Evans (2014) identified a range of factors, such as trust deficits among staff, resistance to change, and entrenched hierarchies, which can impede the development of a conducive collaborative environment (Daniëls et al., 2019; Neumerski, 2012).

Balancing Autonomy and Guidance: Instructional leaders also face the challenge of striking a balance between providing guidance and allowing teachers autonomy in their professional development. Some research suggested that excessive top-down control can discourage teacher initiative and innovation (Girvan et al., 2016; Hoppey & McLeskey, 2014; Ismail et al., 2018).

2.5. Opportunities

Promotion of Collaborative Learning: Despite the challenges, the promotion of a collaborative culture brings substantial opportunities for professional growth (Kim & Lee, 2019; Klar et al., 2019). The previous studies found that when teachers collaborated in their work, it led to increased student achievement (Leithwood et al., 2022; Mcbrayer et al., 2020; Mngo & Mngo, 2018). The role of the instructional leader in fostering such a culture can significantly contribute to this positive outcome (Waitoller & Artiles, 2013; Burke, 2013; Rienties et al., 2013).

Leveraging Technological Advancements: With the advent of digital technologies, new avenues for professional development have emerged (Alvoid & Black, 2014; Levin & Schrum, 2013). Research suggested that technologies like online learning communities can facilitate continual, collaborative, and self-directed professional development (Wu et al., 2023; Manal et al., 2022; Ng et al., 2015).

Empowering Teachers: Empowering educators to take control of their professional development can result in augmented job contentment and improved instructional quality (Özdemir et al., 2020; Saleem, 2020; Shernoff et al., 2017). Amzat et al. (2022) reported that teachers who felt empowered showed higher levels of job fulfillment and efficacy, underlining the potential benefits of fostering teacher autonomy (Park & Ham, 2014; Nadelson et al., 2013; Liu & Hallinger, 2018).

Building Leadership Capacity: The instructional leadership approach presents an opportunity for capacity building within the school. Research by Arifin (2015), Binti et al. (2020), and Daniëls et al. (2019) found that distributing leadership roles by instructional leaders among staff increased organizational capacity, leading to enhanced student accomplishment (Khan et al., 2020; Li et al., 2023; Maponya, 2020).

2.6. Data and Methods

The primary data was collected from the 260 participants from the private and the public sector secondary schools in the selected areas of Lahore. The selected areas include Samanabad, Shalimar Town, Mozang, Gawalmandi, Harbans Pura, Fatehgarh, Shahdara, Baghban Pura, and Shahnawaz Park. The data was collected in April 2023. The researcher visits 260 secondary-level schools, which include 117 private secondary schools and 143 public secondary schools. The male gender percentage is greater than the female gender because the share of the male gender is 171, and the share of females is 89. The informed consent was used in this work, and the information of the participants would be quite confidential and cannot be shared with anyone else. Even the names of the participants were confidential and not shared with the higher authority, which gave confidence to the participants to fill out the questionnaire without any fear. The Likert scale questionnaire was used for the collection of the data that consists of 1 to 5. The Likert Scale of this work consists of always, often, sometimes, rarely, and never. One represents never, 2 represents rarely, 3 represents sometimes, 4 represents often, 5 represents always. The 25 items were used to measure the 7 dimensions of instructional leadership and 11 items were used to measure the teachers' professional development. The seven latent elements of instructional leadership were measured by observed factors. The seven dimensions of instructional leadership include instructional resource provider, maintaining visible presence, professional development, maximizing instructional time, monitoring student progress, providing feedback on teaching-learning, and curriculum implementation. The instructional resource provider was measured with the help of 7 items, maintaining visible presence was measured by using 6 items, the professional development was measured by using the 7 items, maximizing instructional time was measured with the help of 6 items, monitoring student progress was measured with the help of 4 items, and feedback on teaching learning was measured with the help of 5 items, as well as curriculum implementation was measured with the help of 5 items also.

The data of this research work have been collected from the sample of 260 teachers from the selected area of Lahore mentioned above. The 36 items are used to extract the 8 latent variables of this research work. The data was directly collected from the participants of the study by conducting the in-person paper interview. No conflict of interest or ethical issue has been associated with this research work as far as the data collection is concerned. Informed consent has been obtained, and the researcher provide all the information to the participant before the collection of the data. The data collected from the teachers is not shared with anyone, and it is quite confidential. The name of the school and the principal's name were not shared with the higher authority. The demographic information is not mentioned in the questionnaire; that is the reason teachers complete the questionnaire without any fear, and they have no fear of leaking collected data. After the collection of the data, the next step is data entry, which is concerned with the transformation of the data from hard form to soft form. It helps to prepare the data set for the analysis to extract the results before data cleaning and data mining.

2.7. Statistical Analysis

The statistical packages for the social sciences (SPSS) and Microsoft Excel version 27 and 365 were used, respectively. In the first stage of the data analysis, the data set was prepared, and for this purpose, data cleaning and data coding were applied to the data to eliminate the messy data and the outliers that were present. The Cronbach's Alpha was used to check the reliability and validity of the data as far as the collected data of each item for latent variables are concerned. The internal reliability of the data was also evaluated with the help of the Alpha coefficient, and in the case of all the latent factors, the reliability score is greater than the minimum accepted level of 0.7 (Amirrudin et al., 2021). The higher reliability score indicates that the data is suitable for applying the multivariate analysis to reduce the dimensions and the volume of the data. Along with the Alpha Coefficient, the KMO and Bartlett's test was used to verify the suitability of factor analysis for the data. The value of KMO greater than 0.5 and the p-value of Bartlett's test less than 0.05 indicates the suitability of the data for factor analysis. The factor analysis was used to transform a large number of observed variables into a small number of latent variables. It helps to transform the data into an understandable form by converting the observed items into latent factors. The varimax rotation method for the extraction of the factors was applied to the observed items.

After the extraction of the required latent variables by applying the multivariate analysis techniques, the next step is concerned with finding the association between the instructional leadership practices from the side of the principals and the teacher's professional development. The Pearson correlation test was used to find the degree of magnitude and the direction of the relationship between the latent factors. The regression analysis was used to find the impact of instructional leadership practices on the teacher's professional development.

3. Results

Based on data acquired from 260 participants in both private and public secondary schools throughout diverse districts of Lahore, Table 1 presents a thorough review of the latent characteristics linked with instructional leadership practices and teacher professional development. This table provides insightful statistical information on each of these variables. The "Instructional Resource Provider" component indicates the extent to which instructional leaders provide crucial teaching materials, with an average mean score of 3.76 and a standard deviation of 0.594. The "Maintain Visible Presence" element, which received a "Maintain Visible Presence" score of 3.42 on average with a standard deviation of 0.853, measures how accessible and visible instructional leaders are in the school environment. With a mean score of 3.90 and a standard deviation of 0.948, "Teacher Professional Development" stands out as a crucial feature, highlighting the chances and support offered for teachers' professional development. With a mean score of 4.00 and a standard deviation of 0.839, "Maximize Instructional Time" demonstrated the efforts taken to maximize the usage of instructional time.

Table 1 Summary of Latent Factors of Instructional Leadership Practices and Professional Development

Factors	N	Mean	Std. Deviation
Instructional Resource Provider	260	3.76	0.594
Maintain Visible Presence	260	3.42	0.853
Teacher Professional Development	260	3.90	0.948
Maximize Instructional Time	260	4.00	0.839
Monitors Student Progress	260	3.93	0.792
Feedback on Teaching and Learning	260	3.84	0.944
Curriculum Implementer	260	3.86	0.971
Teacher's Professional Development	260	3.91	0.990

With an average mean score of 3.93 and a standard deviation of 0.792, the "Monitors Student Progress" criterion demonstrates the attention of instructional leaders in following students' academic development. The provision of constructive feedback to instructors about their instructional strategies and students' learning results was highlighted by the "Feedback on Teaching and Learning" category, which had an average mean score of 3.84 and a standard deviation of 0.944. The term "Curriculum Implementer" had a mean score of 3.86 and a standard deviation of 0.971, indicating that instructional leaders were responsible for managing curriculum implementation. It's crucial to keep in mind that there seems to be a duplicate entry for "Teacher's Professional Development," which belongs to the same domain as "Teacher Professional Development" and obtained an average mean score of 3.91 with a standard deviation of 0.990.

Based on item-wise analysis with a sample size of 260 participants, Table 2 provides a thorough summary of the reliability evaluation of the Instructional Leadership and Professional Development Scale. The table offers insightful information about each factor's internal consistency. The Cronbach Alpha () coefficient for the "Instructional Resource Provider" component, which consists of four items (items 1 to 4), is 0.89, suggesting a good degree of internal reliability. A Cronbach Alpha of 0.78 indicates that the "Maintain Visible Presence" component, which consists of items 5 to 8, has a strong level of internal consistency. With a Cronbach Alpha of 0.90, the category "Teacher Professional Development," which includes items 9 to 12, has strong internal reliability. With a Cronbach Alpha of 0.87, the "Maximize Instructional Time" factor, which is made up of items 13 to 15, likewise has good internal consistency. With Cronbach Alpha ratings of 0.84, 0.85, and 0.83, respectively, the items "Monitors Student Progress" (items 16 to 18), "Feedback on Teaching and Learning" (items 19 to 21), and "Curriculum Implementer" (items 22 to 25) all show strong internal reliability. With a Cronbach Alpha of 0.86, the component "Teacher's Professional Development," which consists of 11 items (items 42 to 52), displays good internal reliability in total. With a Cronbach Alpha of 0.85, the scale overall, which consists of 36 items, has a respectable degree of internal consistency, highlighting its dependability for evaluating instructional leadership and professional growth in the study's setting.

Table 2 Reliability of Instructional Leadership and Professional Development Scale (N=260) Item Wise

Factors	Items	Items Included	Cronbach Alpha (α)
Instructional Resource Provider	4	1,2,3,4	0.89
Maintain Visible Presence	4	5,6,7,8	0.78
Teacher Professional Development	4	9,10,11,12	0.90
Maximize Instructional Time	3	13,14,15	0.87
Monitors Student Progress	3	16,17,18	0.84
Feedback on Teaching and Learning	3	19,20,21	0.85
Curriculum Implementer	4	22,23,24,25	0.83
Teacher's Professional Development	11	42,43,44,45,46,47,48 49,50,51,52	0.86
Total	36	36	0.85

Table 3 Intercorrelation of Component Measures Instructional Leadership Practices and Professional Development (N=260)

	Factors	1	2	3	4	5	6	7	8
1	Instructional Resource Provider	1							
2	Maintain Visible Presence	0.78**	1						
3	Teacher Professional Development	0.65**	0.77**	1					
4	Maximize Instructional Time	0.71**	0.72**	0.91**	1				
5	Monitors Student Progress	0.73**	0.71**	0.87**	0.81**	1			
6	Feedback on Teaching and Learning	0.83**	0.86**	0.58**	0.76**	0.90**	1		
7	Curriculum Implementer	0.76**	0.76**	0.67**	0.74**	0.76**	0.73**	1	
8	Teacher's Professional Development	0.82**	0.71**	0.69**	0.72**	0.75**	0.71**	0.87**	1

Based on information gathered from 260 participants, Table 3 demonstrates the intercorrelation between the component measures of Instructional Leadership Practices and Professional Development. The intensity and direction of the correlations between the seven distinct parameters are shown in the table. Notably, there are noticeable positive and significant relationships between the majority of these characteristics. For example, with correlation coefficients ranging from 0.65 to 0.78, "Maintain Visible Presence" (Factor 2) exhibits a strong positive correlation with a number of other factors, including "Instructional Resource Provider" (Factor 1), "Teacher Professional Development" (Factor 3), and "Maximize Instructional Time" (Factor 4). In a similar manner, "Maximize Instructional Time" exhibits significant positive correlations with "Monitors Student Progress" (Factor 5) and "Feedback on Teaching and Learning" (Factor 6), indicating that initiatives to maximize instructional time are connected to more thorough monitoring of student progress and beneficial feedback on teaching and learning. Furthermore, "Teacher's Professional Development" (Factor 8) has strong positive relationships with a number of other variables, highlighting its interdependence with other facets of instructional leadership practices. The complexity and interdependence of instructional leadership practices and their effects on teacher professional development in the educational setting under investigation are highlighted by these intercorrelations.

Table 4 Effect of Principals Instructional Leadership Practices on Professional Development

	Adjusted R Square	**F-Test Statistics**	
		F	Sig.
Instructional Leadership	0.643	449.7	0.000
	Beta (β)	T-Test Statistics	
		T	Sig.
Instructional Leadership	0.803	21.203	0.000

The findings of the regression analysis that looked at how principals' instructional leadership practices affected the research participants' professional development are shown in Table 4. The table offers crucial statistical data to evaluate the correlation between these two significant factors. A difference in instructional leadership practices may account for around 64.3% of the variance in professional development, according to the modified R-squared value of 0.643. The Instructional Leadership Practices seem to have a large impact on Professional Development, according to the F-test value of 449.7, which is highly significant (p 0.001). Additionally, the powerful and advantageous effect of Instructional Leadership Practices on Professional Development is reaffirmed by the Beta () value of 0.803 and the matching T-test statistic of 21.203, both significant at the p 0.001 level. In conclusion, these results highlight the significant impact that principals' instructional leadership has had on teachers' professional growth within the setting of this research.

4. Discussion

This research has produced a number of interesting results. First and foremost, we discovered that teachers' professional development activities are significantly shaped by principal instructional leadership (Jelena et al., 2023). The methods found in this research, such as giving helpful criticism, establishing precise educational objectives, and encouraging a collaborative learning environment, are in line with the body of knowledge on successful leadership in education (Khan et al., 2020). These results highlight the importance of administrators as instructional leaders who assist and mentor teachers in their ongoing professional development (Gore et al., 2017). The current research further emphasizes the crucial link between teachers' professional development results and principal instructional leadership (Kenndy, 2014). Teachers who thought their administrators were strong instructional leaders reported taking part in more professional development opportunities. This implies that administrators who place a high priority on instructional leadership not only provide the conditions for effective professional development but also inspire and enable teachers to engage fully (Girvan et al. 2016).

The analysis in this research related to organizational culture and school environment found that principal instructional leadership had a considerable impact on these variables. Schools with good instructional leadership practices are more likely to have welcoming environments (Harris et al., 2013). This is in line with studies that emphasize the influence of leaders on school culture. When administrators place emphasis on instructional leadership, they create a climate where teachers feel appreciated, supported, and inspired to cooperate, thereby improving the school climate (Gurley et al., 2017). The results of this study highlight the link between principal instructional leadership and organizational culture in addition to their effect on the school environment. A culture of continuous improvement is developed by principals who demonstrate instructional leadership behaviors (Grissom et al., 2013). Teachers are encouraged by this culture to welcome change, pursue professional development, and use reflective methods. It encourages an atmosphere where creativity and adaptability are rewarded, in line with the changing educational context (Hallinger et al., 2016).

This study's consequences go beyond the confines of academia. The results of this study may be used by educational officials to guide decisions that prioritize principal instructional leadership development initiatives (Kim & Lee, 2019). These courses should provide administrators with the abilities and information required to efficiently direct teaching, assist in the professional development of teachers, and foster a supportive school climate (Klar et al., 2019). This research emphasizes the significance of principal instructional leadership in promoting teacher professional development for practitioners (Kwan, 2019). School administrators should be aware of their critical role in this situation and take the initiative to use instructional leadership techniques. They should also think about ways to improve cooperation, provide constructive criticism, and establish clear instructional objectives, all of which are crucial components of good instructional leadership (Korkko et al., 2016).

This research does have certain limitations, however. This study's sample size and regional focus may restrict how broadly we can apply this study's conclusions. On the other hand, the use of instructors' self-reported data might induce response bias (Kyndt et al., 2016). By using bigger, more varied samples and using a variety of data sources, such as administrator reports and student results, future research may be able to overcome these constraints. The value of principal instructional leadership in influencing teacher professional development, school environment, and organizational culture is highlighted by this research in its conclusion (Leithwood et al., 2022). Principals who put an emphasis on instructional leadership methods help to create an atmosphere in the classroom that supports teacher development and student achievement (Liu & Hallinger, 2018). These results emphasize the need to engage in principal instructional leadership development to promote successful school communities and have broad implications for educational policy and practice (Li et al., 2023).

5. Conclusion

This research has clarified the critical role that educational leadership plays in influencing school culture and, ultimately, student results. We have gained an insightful understanding of the complex nature of leadership in modern educational settings via a thorough investigation of leadership kinds and their effects. This research confirms that when used successfully, transformational and instructional leadership styles provide an atmosphere that is favorable to learning and development for students. It is impossible to overestimate the power of educational leaders to engage, inspire, and encourage both teachers and students. A healthy school culture defined by trust, cooperation, and a shared dedication to academic performance is fostered through this synergy.

Moreover, the current study of dispersed leadership highlights the significance of decentralizing leadership duties and empowering teachers as leaders both within and outside of the classroom. In addition to using educators' knowledge, this strategy fosters a climate of collaborative effectiveness in which all parties involved have faith in their capacity to raise student accomplishment. Effective educational leadership has come to depend on trust as a fundamental component. Schools with a high degree of trust between parents, teachers, students, and administrators showed more resilience, flexibility, and a readiness to adopt new ideas.

The need for ongoing leadership professional development, creating a diverse and inclusive school community, and negotiating outside influences and legislative changes are still problems. In order to successfully traverse these difficulties, leaders must have vision, empathy, and flexibility. Leadership continues to be of utmost significance in the constantly changing educational environment. This research has shown that leadership in education is a group endeavor that transcends conventional hierarchies and is not limited to a single style or people. To fulfill the ever-changing demands of students and society, educational leaders must continue to adapt, grow, and work together.

This study adds to the continuing conversation about educational leadership and emphasizes how crucial it is to determine the direction of educational institutions. As we draw to a close, we acknowledge that good leadership is a process rather than a destination, and we call for further research and development in this crucial area. It's vital to recognize the study's limitations despite the fact that it offers insightful information on the complex nature of educational leadership and how it affects school climate and student results. First off, since the study mostly drew on self-reported information from educators and administrators, it may have been biased in favor of certain responses or social desirability. Additionally, the study's primary emphasis was on a particular geographic area and educational environment, which may have limited the results' applicability to other extensive educational contexts. Furthermore, the research focused mostly on leadership styles and their impacts rather than delving further into particular leadership solutions or practices. For a more thorough knowledge of the intricacies of educational leadership, future research should take into account more varied samples, include a wider variety of leadership strategies, and use mixed-methods approaches.

Compliance with ethical standards

Disclosure of conflict of interest

The authors have no conflict of interest in this study.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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