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Bridging Educational Research and Teacher Performance: Multiple Mediation Analysis of Professional Development and Teacher Leadership

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ABSTRACT

This study explores the mediating roles of professional development and teacher leadership in the relationship between educational research and teacher performance. Data from 465 Turkish teachers were analyzed using a multiple mediation model. Results show that educational research positively influences teacher performance directly and indirectly through professional development and leadership, enhancing overall performance. Significant connections between educational research, professional development, and leadership are highlighted. The findings suggest that integrating educational research with teacher development and leadership can improve teacher performance, providing valuable insights for educational leaders and policymakers focused on enhancing teacher effectiveness.

Introduction

Understanding the impact of teacher performance (TP) on student achievement and outcomes is one of the primary aims of educational research. In this regard, numerous studies in the field of education have provided substantial evidence demonstrating that teacher performance is one of the most critical factors influencing student outcomes (Blazar, 2016; Borman & Kimball, 2005; Darling-Hammond, 2000; Milanowski, 2004; Pardosi & Utari, 2021; Stronge et al., 2007). However, the factors that shape teacher performance and effectiveness, and thus impact student outcomes, are still being actively researched (Anastasiou & Papakonstantinou, 2014; Darling-Hammond & Richardson, 2009; Kanya et al., 2021; Lenhoff et al., 2018; Tehseen & Hadi, 2015). In particular, social cognitive theory explains the behavior and performance of individuals through the interaction of internal and external factors (Bandura, 1986, 1989, 1991, 2001). According to this theory, teacher performance is a result of individual, environmental and behavioral factors and can be affected by the interaction of these factors. In this context, it has been noted that educational research (ER) plays a pioneering role in enhancing teacher performance and classroom practices, improving the quality of education, and addressing educational challenges (Biesta, 2007; Biesta & Burbules, 2003; Carr, 2007; Darling-Hammond, 2000; Lodico et al., 2010). Despite these contributions, there are criticisms suggesting a gap between educational research and classroom practices, with claims that such research does not sufficiently impact teacher performance (Costa et al., 2000; Foegen et al., 2001; Hargreaves, 1996). The core of these critiques revolves around the lack of clear mediating mechanisms explaining how teachers can acquire the necessary knowledge, skills, and competencies from educational research, how they can apply these innovations in the classroom, and how these practices can be disseminated

throughout schools. This issue underscores the complexity of the relationship between educational research and teacher performance, highlighting the mediating roles of professional development (PD) and teacher leadership (TL) in enhancing teacher performance.

Educational research not only helps teachers apply scientific and innovative methods to their classes, but also forms the basis for their dissemination in the school environment and for improving the quality of education. This process transforms teachers from passive practitioners who only transmit information into professionals who question and improve their own teaching (Kincheloe, 2012). Educational research equips teachers with innovative strategies and insights, enhancing both their teaching methods and classroom performance. Indirectly, it also fosters improvements in classroom management and student achievement. However, for teachers to effectively integrate research findings into their practice, they must engage in professional development programs and cultivate their leadership skills. High-quality educational research has a positive impact on the overall quality of education (Wittrock, 1986), teacher professional development (Moutafidou et al., 2012), teacher performance, and teacher education (McMeniman et al., 2000). While many studies focus on the direct relationships between variables (Biesta, 2007; Everton et al., 2000; Fairman & Mackenzie, 2015; McMeniman et al., 2000; Moutafidou et al., 2012; Nguyen et al., 2020; Yalçın & Özgenel, 2021), there is a clear need for more nuanced investigations into the indirect effects of teacher leadership and professional development on the relationship between educational research and teacher performance. This study seeks to explore the mediating roles of teacher leadership and professional development within this dynamic. By examining these interactions, we aim to gain a more comprehensive understanding of how educational research influences teacher performance, not only directly but also through the combined effects of leadership and professional development. The creation of such a model offers a theoretical framework for future research. It also provides educational leaders and school administrators with valuable evidence regarding the importance of professional development and leadership enhancement in improving teacher performance. The findings of this research can assist policymakers in crafting strategies and establishing structures that encourage teachers to engage in research, promote ongoing professional development, and reinforce their leadership capacities.

Theoretical Background and Hypotheses Development

The conceptual and empirical findings of the study's variables are discussed in this part.

The Relationship Between Educational Research and Teacher Performance

Teacher performance is widely acknowledged as one of the most critical factors influencing student outcomes (Odden, 2004; Rockoff, 2004). Defined as the organized execution of tasks aimed at achieving specific educational objectives (Andriani et al., 2018; Nwanekezie & Ogona, 2021; Shah, 2009), teacher performance is a pivotal element in establishing a productive and effective learning environment (Castle & Shaklee, 2006). Several factors contribute to teacher performance, including relationships with students, the school administration's approach, professional development, and the integration of educational research (Brown, 2005; Can & Baksi, 2014). When educational research is closely aligned with classroom practices and supported by school leadership, it has a positive impact on teacher performance, fostering a healthier and more effective teaching and learning environment (Cohen et al., 2000).

Educational research plays a crucial role in improving the quality of education by bridging the gap between theory and practice. It helps teachers perform more effectively, adapt to the demands of modern education, and address gaps in their classroom knowledge and skills (Cohen et al., 2000; Hamacheck, 1975; Vanderlinde & van Braak, 2010; Yashkina & Levin, 2008). However, despite its potential, many teachers feel that educational research does not sufficiently address the practical challenges they face in the classroom, leading to generally negative attitudes toward its utility (Biesta, 2007; Cordingley, 2008; Costa et al., 2000; Ekiz, 2006; Everton et al., 2002; Foegen et al., 2001;

McIntyre, 2005). Altering these negative perceptions requires targeted efforts to make educational research more accessible and applicable to teachers' daily practices. Studies suggest that reducing teachers' workloads, enhancing access to research findings, providing necessary resources for the application of research, and fostering stronger collaboration between teachers and researchers are key strategies for improving the practical relevance of educational research (Ekiz, 2006; Grm & Savec, 2013; Vanderlinde & van Braak, 2010). When these conditions are met, educational research has the potential to significantly enhance both teacher and school performance (Armağan, 2012; McMeniman et al., 2000; Papatotiriou & Hannan, 2006; Purinton, 2012). Given the direct influence of educational research on teacher performance, it not only enhances classroom practices but also indirectly contributes to the cognitive, emotional, and physical development of students. Based on the theoretical and empirical relationships between these variables, the following hypothesis is proposed:

H1: ER and TP are positively related.

The Relationship Between Educational Research and Professional Development

There is growing consensus among policymakers, researchers, and practitioners that teacher professional development is essential for educational reform (Bredeson, 2000). High-quality professional development is a powerful tool for enhancing the overall quality of education, as it positively influences classroom instruction and academic achievement. In other words, professional development aims to improve and strengthen teachers' skills and abilities, thereby raising the quality of teaching and learning (Blandford, 2003). Research consistently highlights the critical role of professional development in enhancing teacher competence and student outcomes (Darling-Hammond et al., 2017; Desimone, 2009). Consequently, teachers must continuously develop themselves and address any gaps in their knowledge to become more productive, efficient, and effective professionals (Grm & Savec, 2013; Kış, 2007). In this context, educational research serves as a key resource for professional development, reducing errors and empowering teachers (Ekşi, 2010; Moutafidou et al., 2012; Muyan, 2013). One of the most fundamental contributions of educational research is its role in facilitating the professional development of teachers (Mortimore, 2000). Educational research enhances teachers' professional skills and increases their scientific literacy (Hui & Grossman, 2008), improving educational processes (Hemsley-Brown & Sharp, 2003; Savlet, 2017) and classroom practice (Biesta, 2007; Hemsley-Brown & Sharp, 2003). Numerous studies have examined the impact of teachers' engagement in research on classroom practices. These studies show that when teachers actively participate in research, they improve their classroom practices, and this process contributes to their professional growth (Chow et al., 2015; Everton et al., 2000; Ulla et al., 2017; Worku et al., 2022). The findings indicate that educational research introduces innovative approaches in areas such as effective teaching methods and classroom management techniques, providing a solid scientific foundation for teachers' practices while enhancing their professional knowledge and skills. Based on the theoretical and empirical relationships between these variables, we can propose the following hypothesis:

H2: ER and PD are positively related.

The Relationship Educational Research and Teacher Leadership

It is crucial that teachers, as the most essential members of a school, possess both leadership capabilities and professional knowledge, skills, and competencies (Harris, 2005; Turan, 2010). In this context, teacher leadership is defined as the ability of individuals to collaborate with colleagues to design educational practices and use their behaviors to influence both their peers and students

(Muijs & Harris, 2006; Murphy, 2005). Teachers with leadership qualities must be able to work collaboratively, possess knowledge of effective methods, and continuously update their skills to meet the evolving demands of educational activities (Frost & Harris, 2003). Teachers can address today's educational needs in a professional manner when they are equipped with accurate and reliable knowledge (Yilmaz, 2020). Educational research is a vital tool for gathering accurate and reliable information throughout the educational process. While the literature highlights some criticism that research in education often has limited impact on school practices (Papasotiriou & Hannan, 2006; Sahin & Arcagök, 2013), it is widely acknowledged that educational research is essential for the professional development of teachers and should be actively pursued (Beycioğlu & Aslan, 2010; Moutafidou et al., 2012). Educational research influences teacher leadership in various ways. For instance, it equips teacher leaders to perform their roles more effectively by enhancing their professional knowledge and skills, facilitating the sharing of research-based insights and innovative teaching strategies with colleagues, and promoting positive changes in classroom practices. Based on the theoretical and empirical findings, we propose the following hypothesis:

H3: ER and TL are positively related.

The Relationship Between Professional Development and Teacher Performance

As pedagogical advancements redefine teachers' roles and bring about significant changes in teaching practices, it becomes increasingly important that teachers engage in continuous professional development (Anwar, 2014; Guskey, 2000; Posnanski, 2002). Professional development is a critical tool with a direct impact on student outcomes, as it aims to enhance teachers' current knowledge and instructional methods (Al-Ghatrifi, 2016; Beauchamp et al., 2014; Cochran-Smith et al., 2020; Desimone, 2009; Feiman-Nemser, 2001; Guskey & Yoon, 2009; Hanushek, 2011; Joyce et al., 2008; Kennedy, 2016; Mathew et al., 2017; Saeed & Akhtar, 2017). Teachers' attitudes toward teaching, along with their performance, are shown to improve as a result of professional development initiatives (Blandford, 2000; Van den Berg, 2002). In fact, professional development is regarded as the most effective means of enhancing teacher effectiveness in contemporary education (Rhodes & Beneicke, 2003). Numerous studies have demonstrated the positive impact of professional development on teachers' performance (Ferguson & Womack, 1993; Yalçın & Özgenel, 2021). Based on the theoretical and empirical relationships between these variables, we can propose the following hypothesis:

H4: PD and TP are positively related.

The Relationship Between Teacher Leadership and Performance

Teacher leaders are individuals who meet student needs at a high level in the classroom and at school (Darling-Hammond et al., 1995, 2017), influence their colleagues to improve the quality of education (Katzenmeyer & Moller, 2001; Swaffield & Alexandrou, 2016), and undertake various roles and responsibilities in the education-teaching processes (York-Barr & Duke, 2004). In other words, teacher leadership is a form of leadership that directly impacts the performance of teachers, alongside influencing students, other teachers, and overall learning outcomes. Teacher leadership plays a crucial role in shaping teachers' attitudes, behaviors, and, consequently, their performance levels (Fairman & Mackenzie, 2015; Nicholson et al., 2017). According to Barth (2001), the leadership behaviors exhibited by a teacher contribute to improved performance among their colleagues. Teacher-led initiatives aimed at enhancing education are also associated with increased teacher performance (Ingersoll et al., 2017). Wenner and Campbell (2017) stated that teacher leaders increase the effectiveness of professional development programs by successfully directing them during the

processes in which they interact with their colleagues. Therefore, teacher leadership directly contributes to the more effective implementation of professional development processes and the performance of teachers. Moreover, teacher leadership strengthens teachers' pedagogical and subject-area knowledge, which in turn boosts their motivation and overall performance (Johnson et al., 2014). Similarly, Danielson (2006) emphasized that teacher leadership should be integral to performance improvement processes and serves as a valuable resource for enhancing school performance, both within and beyond the classroom. Based on the theoretical and empirical relationships between these variables, we can propose the following hypothesis:

H5: TL and TP are positively related.

The Relationship Between Professional Development and Teacher Leadership

Teacher leadership is a form of leadership that directly influences not only the performance of teachers but also impacts students, other educators, and overall learning outcomes. Teachers who exhibit leadership qualities by solving problems, reflecting on their goals, and applying scientific developments are recognized as leaders (Can & Baksi, 2014). Teacher leadership plays a pivotal role in shaping teachers' attitudes, behaviors, and consequently their performance levels (Öztürk & Şahin, 2017). Supporting new teachers, trainees, or peers through shared experiences and guidance from teacher leaders significantly enhances overall teacher performance (Beycioğlu, 2009; Beycioğlu & Aslan, 2010). As noted by Barth (2001), the leadership behaviors exhibited by a teacher contribute to improved performance among their colleagues. Teacher-led initiatives aimed at improving education are similarly associated with increased teacher performance (Ingersoll et al., 2017). Additionally, teacher leadership strengthens teachers' pedagogical and subject-area knowledge, which in turn boosts their motivation and overall effectiveness (Johnson et al., 2014). Danielson (2006) also emphasized that teacher leadership should be central to performance improvement processes, serving as a valuable resource for enhancing school performance both within and beyond the classroom. Professional development plays a key role in helping teachers develop their leadership potential by providing them with new teaching strategies, classroom management techniques, and leadership skills (Makuachukwu, 2023; Patfield et al., 2023; Xie et al., 2021). The knowledge and skills gained from professional development activities enable teachers to share innovative educational approaches with their colleagues and assume leadership roles in their schools. Based on the theoretical and empirical evidence linking teacher leadership and performance, we propose the following hypothesis:

H6: PD and TL are positively related.

The Mediating Role of Professional Development and Teacher Leadership

Teachers enhance their effectiveness in practice by expanding their teaching knowledge and skills through educational research (Winch et al., 2015). This process is further supported by professional development and teacher leadership. Teachers gain new knowledge, skills, and methods by participating in high-quality professional development initiatives designed to improve their performance and foster personal growth (Boles & Troen, 1994; Garet et al., 2001; Gonzales & Lambert, 2001; Nasution et al., 2024). These professional development activities not only increase school effectiveness but also strengthen teacher leadership (Darling-Hammond et al., 1995; Hickey & Harris, 2005). Teacher leaders, who are open to professional learning (Wenner & Campbell, 2017) and actively influence the quality of teaching (Nicholson et al., 2017), contribute to professional development by sharing innovative ideas and new practices with their colleagues, thereby improving both their own performance

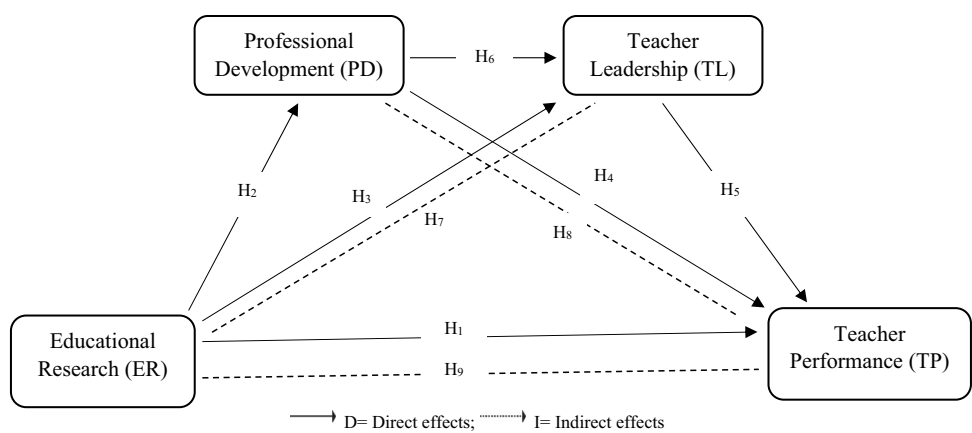


Figure 1. Conceptual framework of the study.

and that of others (Fairman & Mackenzie, 2015; Flores, 2018; Nicholson et al., 2017). In this respect, professional development and teacher leadership play a crucial role in integrating educational research into classroom practices, helping teachers overcome challenges and adopt new strategies. Ultimately, these processes lead to enhanced teacher performance through the sharing of knowledge, innovative practices, and effective techniques. As a result, teachers are better equipped to deliver high-quality education in the classroom, improving student learning outcomes. In other words, professional development and teacher leadership serve as key mechanisms through which educational research is translated into practice, thereby impacting teacher performance. Based on the theoretical and empirical evidence linking teacher leadership and performance, we propose the following hypothesis (Figure 1):

- H7:** Professional development plays a mediating role in the positive relationship between educational research and teacher leadership.
- H8:** Teacher leadership plays a mediating role in the positive relationship between professional development and teacher performance.
- H9:** Both professional development and teacher leadership play a mediating role in the positive relationship between educational research and teacher performance.

Method

Research Model

The aim of this study is to examine whether professional development and teacher leadership play a mediating role in the relationship between educational research and teacher performance. The study employs a correlational survey approach and tests the proposed relationships using a theoretical mediation model. The correlational survey model is used to assess the strength of the relationships between variables (Fraenkel & Wallen, 2009; Martella et al., 2013), while the mediation model evaluates the fit between the collected data and the theoretical framework (Özgenel, 2018).

Participants

A total of 462 teachers from primary, secondary, and high schools in Istanbul and Izmir provinces participated in the research voluntarily in the 2022–2023 academic year. 70.1% of the research was female teachers and 29.9% was male teachers. 83.8% was undergraduate and 16.2% was postgraduate teachers. The average age of the teachers was 38.9 (± 8.22), while their average seniority was 14.6 (± 8.31) years.

Instruments

Ethical approval for this study was obtained from the Ethics Committee of Fatih Sultan Mehmet Vakıf University. Data were collected from teachers working in public schools in Izmir and Istanbul, who voluntarily participated in the research. The data collection instruments included the “Personal Information Form,” “Teacher Attitude Scale Towards Educational Research,” “Teacher Leadership Scale,” “Attitude Scale Towards Professional Development,” and the “Performance Scale.”

Teacher Attitudes Towards Educational Research Scale

This scale, developed by İlhan et al. (2013), measures teachers’ attitudes toward educational research. It consists of 20 items divided into three sub-dimensions: “The Necessity of Educational Research” (7 items), “The Value of Educational Research” (6 items), and “The Application of Educational Research” (7 items). Responses are rated on a 5-point Likert scale, ranging from “I strongly disagree = 1” to “I totally agree = 5.” Items 9, 10, 11, 12, 13, 15, and 17 are reverse scored. The total score on the scale ranges from 20 to 100 points. The Cronbach’s Alpha values for the sub-dimensions were .84, .82, and .78, respectively, with a value of .88 for the overall scale.

Teacher Leadership Scale

Developed by Beycioğlu and Aslan (2010), this scale assesses the leadership qualities of teachers. It comprises 25 items divided into three sub-dimensions: “Institutional Development” (9 items), “Professional Development” (11 items), and “Collaboration with Colleagues” (5 items). The scale uses a 5-point Likert format, ranging from “Never = 1” to “Always = 5,” with no reverse-scored items. The total score ranges from 25 to 125. Cronbach’s Alpha reliability coefficients were .87, .87, and .92 for the respective sub-dimensions, and .95 for the overall scale.

Attitude Scale Towards Professional Development

This scale, originally developed by Torff et al. (2005) and adapted into Turkish by Özer and Beycioğlu (2010), evaluates teachers’ attitudes toward professional development. It consists of one dimension and six factors, with responses rated on a 5-point Likert scale from “Disagree = 1” to “Completely Agree = 5.” The second item, “I believe that money spent on training programs for teacher professional development is a waste,” is reverse scored. The total score on the scale ranges from 6 to 30, with a Cronbach’s Alpha reliability coefficient of 0.78.

Performance Scale

Teachers’ performance was measured using the “Employee Performance” factor of the Performance Scale developed by Rahman and Bullock (2005) and adapted into Turkish by Erdoğan (2011). Responses are rated on a 5-point Likert scale, with options ranging from “I strongly disagree = 1” to “I absolutely agree = 5.” No items are reverse-scored, and the total score ranges from 7 to 35. The Cronbach’s Alpha reliability coefficient for the scale was found to be 0.83.

Table 1. Descriptive, kurtosis, skewness, and reliability values.

Scales	M	Sd	Skewness	Kurtosis	α	Number of Items
1- PD	4.175	.636	−.838	.722	.770	6
2-TL	3.977	.579	−.224	−.198	.955	25
3- ER	3.326	.762	−.307	−.358	.898	20
4- TP	4.207	.492	−.504	.107	.734	7

Data Analysis

Initially, the mean, standard deviation, normality (as indicated by kurtosis and skewness), multi-collinearity (measured by Tolerance Value [TV] and Variance Inflation Factor [VIF]), autocorrelation assumptions (Durbin-Watson [DW]), outliers (determined through Mahalanobis and Cook’s distance), and reliability coefficients (Cronbach’s Alpha [α]) for the variables were calculated using SPSS software (Table 1).

According to (Table 1), both the kurtosis and skewness values of the data fall within the acceptable range of ± 1 , indicating a normal distribution (George & Mallery, 2019). The Tolerance Values (PD = .591, TL = .904, ER = .579) and Variance Inflation Factors (PD = 1.691, TL = 1.106, ER = 1.726) confirm that there is no multicollinearity issue, as $VIF \leq 10$ and $TV > 0.10$ (Bruin, 2006). Additionally, Cook’s distance values (Min = .000, Max = .061) are below the threshold of 1.00 (Cook, 1977), and the Mahalanobis values (Min = .022, Max = 15.099; $df = 3$, $p < .001$) are smaller than the critical value of 16.266 (Fisher & Yates, 1953), indicating no outliers in the data. The Durbin-Watson statistic ($DW = 2.068$) falls within the acceptable range of 1 to 3, suggesting the absence of autocorrelation (Yavuz, 2009). Following these assessments, hypothesis testing was performed using AMOS software, and the model was evaluated using a multiple mediation approach. Fit indices, including RMSEA, SRMR, GFI, AGFI, NFI, TLI, CFI, as well as the chi-square value (χ^2), were examined to assess the model’s adequacy (Schermelleh-Engel et al., 2003).

Results

The results of the correlation analysis conducted to examine the statistical relationship between the variables are presented in (Table 2).

According to (Table 2), there is a significant and positive relationship between educational research and professional development ($r = .635$, $p < .01$), performance ($r = .328$, $p < .01$), and teacher leadership ($r = .295$, $p < .01$). Additionally, a significant positive relationship exists between teacher

Table 2. Correlation values between variables.

Scales		M	sd	1	2	3	4
1-Professional Development	r	4.187	.617	1	.376**	.261**	.635**
2-Performance	r	4.210	.492		1	.362**	.328**
3-Teacher Leadership	r	3.978	.580			1	.295**
4-Educational Research	r	3.922	.482				1

* $p < .05$; ** $p < .01$; $N = 462$.

Table 3. Standardized regression coefficients.

			B	S.E.	t	p
PD	<—	ER	.635	.046	17,633	***
TL	<—	ER	.217	.069	3,783	***
TL	<—	PD	.123	.054	2,149	.032
TP	<—	TL	.270	.037	6,255	***
TP	<—	PD	.247	.043	4,624	***
TP	<—	ER	.091	.055	1,693	.090

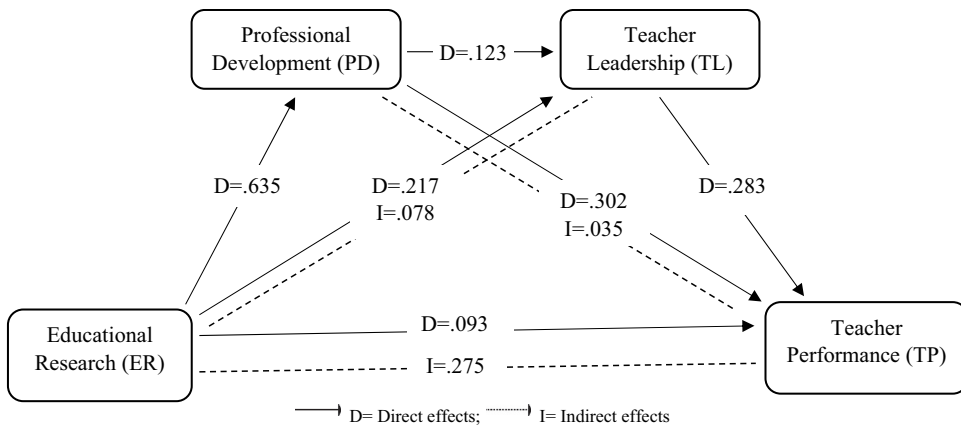


Figure 2. The measurement model.

Table 4. Standardized total, direct, and indirect effect values of the variables.

	Total Effects			Direct Effects			Indirect Effects		
	ER	PD	TL	ER	PD	TL	ER	PD	TL
PD	.635	.000	.000	.635	.000	.000	.000	.000	.000
TL	.295	.123	.000	.217	.123	.000	.078	.000	.000
TP	.275	.337	.283	.000	.302	.283	.275	.035	.000

leadership and both professional development ($r = .261, p < .01$) and performance ($r = .362, p < .01$). Furthermore, a positive and significant relationship was found between teacher performance and professional development ($r = .376, p < .01$). The correlation values between the variables confirmed the hypotheses H_1, H_2, H_3, H_4, H_5 and H_6 .

To assess whether professional development and teacher leadership mediate the relationship between educational research and teacher performance, a multiple mediation analysis was conducted, examining standardized regression coefficients (Table 3).

The findings reveal that educational research has a positive and significant effect on professional development ($\beta = .635, SE = .046, t = 17.633, p < .001$) and teacher leadership ($\beta = .217, SE = .069, t = 3.783, p < .001$). Moreover, professional development positively influences teacher leadership ($\beta = .123, SE = .054, t = 2.149, p = .032$). Both professional development ($\beta = .247, SE = .043, t = 4.624, p < .001$) and teacher leadership ($\beta = .270, SE = .037, t = 6.255, p < .001$) have positive and significant effects on performance. However, the direct effect of educational research on performance was not found to be significant ($\beta = .091, SE = .055, t = 1.693, p = .090$). As a result of the renewed analysis, it was seen that all regression coefficients between the variables were significant ($p < .05$), then the mediating roles of professional development and teacher leadership in the relationship between educational research and performance and the standardized total, direct, and indirect effect values of these relationships were examined (Figure 2 and Table 4).

The direct effects of educational research on professional development ($\beta = .635, p < .001$) and teacher leadership ($\beta = .217, p < .001$), as well as the effects of professional development on teacher leadership ($\beta = .123, p < .05$), and both professional development ($\beta = .302, p < .001$) and teacher leadership ($\beta = .283, p < .001$) on teacher performance, were found to be significant.

The indirect effect of educational research on teacher leadership through professional development was also significant ($\beta = .078, p < .05$). Similarly, the indirect effect of professional development on teacher performance through teacher leadership was significant ($\beta = .035, p < .05$). Moreover, the indirect effect of educational research on teacher performance, mediated by both professional

development and teacher leadership, was significant ($\beta = .275$, $p < .001$). The goodness-of-fit indices further supported the validity of the model, with RMSEA = .063, SRMR = .016, GFI = .997, AGFI = .969, NFI = .993, TLI = .957, CFI = .995, and $\chi^2/df = 2.857$. These indices, along with the chi-square value, indicate a “perfect” fit according to the criteria established by Schermelleh-Engel et al. (2003). According to the model, educational research, professional development and teacher leadership together explain 22% of the total variance in teacher performance ($R^2 = 0.221$). These results show that professional development and teacher leadership play a full mediating role in the relationship between educational research and teacher performance, and confirming the hypotheses developed in the study (H_9). In other words, educational research influences teacher performance both directly and indirectly through professional development and teacher leadership. Additionally, professional development was found to “partially mediate” the effect of educational research on teacher leadership (H_7), while teacher leadership “partially mediates” the effect of professional development on teacher performance (H_8).

Discussion

Although there are criticisms regarding the role and significance of educational research (Foegen et al., 2001), studies have demonstrated that educational research can provide valuable insights that enhance teachers’ classroom practices and overall effectiveness (Darling-Hammond, 2000; Liu et al., 2021; Scott & Usher, 1996). This study analyzed the complex relationships between teachers’ attitudes toward educational research, performance, professional development, and teacher leadership, aiming to offer a new perspective. All findings obtained in the research supported the theoretical model and hypotheses. For this, each hypothesis developed for the research was analyzed. According to the results of the analyses, it was seen that positive attitudes toward educational research were related to teacher performance. This finding is a response to the doubts that educational research is not a component to support teacher performance (Ilhan, 2021; Vanderlinde & van Braak, 2010). Educational research is one of the ways that teachers use to improve their capacity to overcome challenging conditions and address problems. Teachers who actively utilize educational research develop their competences by demonstrating innovative, better teaching methods (Ilhan et al., 2015). Teachers who are exposed to research change their perspectives and gain knowledge and skills to improve their performance (Nguyen et al., 2023). Furthermore, the findings show that there is a linear relationship between educational research and professional development and teacher leadership. When teachers have a positive attitude toward research and inquiry, they improve their professional behaviors. This situation also contributes significantly to school development (Leuverink & Aarts, 2022). Teachers who focus on continuous learning and professional growth expand their knowledge and skills by engaging with educational research (Short & Szabo, 1974). Through participation in educational research, teachers develop technical knowledge, critical thinking skills, and increased awareness (Winch et al., 2015). This, in turn, supports further professional development (Everton et al., 2000) and contributes to the elevation of their professional status (Moutafidou et al., 2012). Teachers “being able to benefit from researches and being in interaction with them make an important contribution to the development of teachers” leadership qualities (Ghamrawi et al., 2024). Thus, educational research not only aids in improving teachers’ professional knowledge and skills but also fosters the development of their leadership potential.

According to the results of the study, both professional development and teacher leadership were found to be related to performance. In addition, the findings show that there is a relationship between professional development and teacher leadership role. Teachers’ interest and curiosity in research related to their profession (Yazıcı & Özgenel, 2024), as well as their attitudes toward their professional duties, are positively reflected in their performance, which is a key organizational output (Ostroff, 1992). Furthermore, teachers who can effectively organize and manage their own learning processes play a crucial role in students’ academic success (Hwang & Vrongistinos, 2002). In the literature, a strong commitment to learning, openness to new ideas, and the development of new skills are

identified as key leadership characteristics (Mitchinson & Morris, 2012) and are closely linked to teacher leadership, which has practical implications in school settings (Fairman & Mackenzie, 2012). Moreover, curiosity about learning and a desire to apply new experiences can cultivate attitudes that drive teachers toward action. It is thought that this difference in teachers' knowledge and attitudes can improve performance positively by reflecting on practices in school and classroom. Developing positive attitudes toward innovation and growth can propel teachers further in their careers, potentially encouraging teacher leadership, which in turn enhances overall school performance. The findings also support the long-established link between professional development and teacher leadership (Darling-Hammond et al., 1995; Poekert, 2012; Watt et al., 2010). In other words, it can be said that the ability of teachers to exhibit leadership characteristics that can affect all stakeholders of the school is related to their willingness to learn and develop toward their profession.

In the study, three mediating models were used to understand the relationship between the variables in more depth. The first finding revealed that professional development mediates the relationship between educational research and teacher leadership. This finding supports the research results showing that teacher leadership in schools develops due to the utilization of educational research and continuous professional learning (Ghamrawi et al., 2024; Leuvenink & Aarts, 2022). On the other hand, teachers who change through professional learning increase their performance through their leadership roles. This finding of the study suggests that teacher leaders who will increase school achievement both in and out of the classroom will increase teacher performance through professional development (York-Barr & Duke, 2004; Zheng & Ye, 2024). Finally, it was determined that professional development and teacher leadership mediate the relationship between educational research and performance. This finding addresses several gaps in the literature. Individuals who seek to enhance their abilities and competencies tend to have a learning orientation, characterized by continuous questioning and research (Kroll, 1988; Wood & Bandura, 1989). These individuals, aiming to advance in their professions by acquiring more knowledge, make behavioral choices that can directly influence their performance (Lombardo & Eichinger, 2000; London & Smither, 1999). This relationship is not always a direct or simple one. It can be inferred that as teachers deepen their knowledge and skills through educational research, they opt for professional development and teacher leadership roles, which ultimately improve their performance. Teachers develop professionally by staying up-to-date through reading journals, accessing online resources, and engaging with educational research findings (Friedman & Phillips, 2004; Kostoulas et al., 2019; Özgenel, 2019). Their interest and passion for the profession positively impact their professional development, leadership skills (Riveros et al., 2013), and performance (Cheng, 1994). Teachers' curiosity about educational research and their drive to question existing practices likely motivate them to engage further in research, development, and experiential learning. Consequently, the professional learning that teachers acquire enhances their leadership potential, empowering them to redefine challenges and generate effective solutions. By raising awareness, developing personal skills, and demonstrating competencies such as risk-taking and collaboration, teachers contribute to improved classroom performance (Fairman & Mackenzie, 2012). Teachers who engage in professional development, demonstrate leadership, and apply research-based practices in the classroom are likely to drive the pursuit of the desired academic and social success. Therefore, it is crucial for school leaders to develop policies that support the professional growth of high-performing teachers who are receptive to learning opportunities and encourage the display of leadership qualities.

Conclusion

The present study provides substantial evidence for the mediating roles of professional development and teacher leadership in the relationship between educational research and teacher performance. Educational research is expected to change, develop, transform and liberate teachers and enable them to continue their professional lives with a critical understanding. The findings show that teachers'

involvement in educational research directly increases their performance, while this relationship is strengthened when professional development and leadership roles are integrated. Educational research not only directly improves teaching practice but also indirectly contributes to teacher performance through its relationship to professional development and leadership. Teachers with positive attitudes toward educational research are more inclined to participate in professional development and assume leadership roles. In other words, educational research plays a critical role in keeping teachers up-to-date and supporting their professional growth. Actively engaging with educational research and participating in professional development activities contribute to teacher leadership, which in turn elevates the overall quality of education in schools. Therefore, both professional development and teacher leadership have a positive relationship with teachers' individual performance. The positive relationship of educational research on teacher performance is further strengthened when combined with professional development and leadership. Ultimately, professional development and teacher leadership enhance teacher performance by translating educational research into practical applications. These findings underscore the importance of developing strategies that encourage continuous learning, professional growth, and the cultivation of leadership qualities among teachers.

Limitations and Directions for Future Research

Although this study makes significant contributions to the literature, it also has some limitations. The first limitation relates to ongoing criticisms of educational research in the literature. These include the notion that educational research is difficult for teachers to comprehend (Vanderlinde & van Braak, 2010), is inadequate, complex, and abstract, and cannot be easily applied in practice (Broekkamp & van Hout-Wolters, 2007; Carr, 2007; Tooley & Darby, 1998). In this study, it was assumed that teachers fully understood educational research during the research process. Secondly, the diversity of teachers' professional development needs and activities, as well as unequal access to development opportunities, can limit the relationship between professional development and teacher leadership (Baecher, 2012). Third, the study was conducted within the Turkish educational system context, which may limit the applicability of the findings to other cultural settings. Because, perspectives on educational research and beliefs about its applicability may vary across cultures (Özgenel & Metlilo, 2021). Future research should explore how cultural factors influence the relationship between educational research, professional development, and teacher leadership across different contexts. Additionally, studies focusing on specific educational research outcomes and targeted professional development programs could further expand the understanding of these relationships. When all results are considered, it becomes clear that developing policies that promote professional development and encourage teachers to exhibit leadership qualities is crucial. Such policies may lead to an increase in the number of teachers who are engaged in learning, research, and high performance.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

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Data Availability Statement

All data and research materials are available at: [https://drive.google.com/file/d/1hnWmzsJttOP8ZzFFpAj5DHxm8E1ZVRyF/view?usp=share_link].

Ethical Approval

Ethical approval was obtained from the Ethics Committee of Fatih Sultan Mehmet Vakıf University for the research (Date and Number of Permission: 02/03/2023–22/01).

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