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Examining the Impact of Distributed Leadership on Teacher Leadership in Secondary Education in China: A Structural Equation Modeling Approach

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This study investigates the intricate relationship between distributed leadership and teacher leadership within secondary schools in China, emphasizing its relevance in a context marked by traditional hierarchical structures. Utilizing a structural equation model (SEM), quantitative data were collected from a sample of 425 secondary school teachers situated in southern China during the academic year 2022–2023. The findings reveal that distributed leadership exerts a significant positive influence on all dimensions of teacher leadership, which include promoting professional learning, focusing on learning processes, encouraging collegial collaboration, engaging in decision-making, and liaising with external affiliations. Notably, the dimension of engaging in decision-making exhibited the most substantial impact. This study underscores the critical role of distributed leadership in enhancing teacher leadership, particularly in the unique educational landscape of Chinese secondary schools. By contributing empirical evidence to the expanding literature on distributed leadership, especially within non-Western contexts, this research highlights the imperative of empowering teachers as key stakeholders in school management. The findings emphasize the critical role of principals in aligning school objectives, talent development, and organizational structure through distributed leadership. Policies should prioritize teacher engagement in decision-making, professional learning, and collaboration while leveraging external resources. Empowering teachers with greater autonomy and involving them in school governance can enhance their professional growth and improve overall teaching quality, demonstrating the transformative impact of distributed leadership on teacher leadership development.

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Introduction

Distributed leadership is a leadership concept that emphasizes the distribution and sharing of leadership roles rather than centralizing them under a single leader (Gronn, 2002). This leadership model gained prominence in the educational field at the beginning of the 21st century and has been implemented in various national educational systems (Liu et al., 2018; Harris, 2014). Many educational institutions have recognized that a single "hero" (principal) cannot adequately address the multifaceted and complex educational environment of modern society, particularly in secondary schools with heavy academic demands (Spillane, 2005). Although research has demonstrated the significant effects of distributed leadership in improving school organization and implementing educational reforms (Hulpia et al., 2009; Leithwood et al., 2009), some scholars have criticized these findings as being limited by specific regional cultural contexts or narrow theoretical applications. Consequently, more empirical studies are needed across different regions and cultural backgrounds (Tian et al., 2016). The rapid development and transformation of China's educational system not only offer a solid foundation for researching distributed leadership but also provide opportunities to obtain empirical evidence distinct from Western cultural contexts.

With the integration of distributed leadership into school management, the role of teachers as key participants in school management becomes increasingly significant. Research on teacher leadership has also gained increasing attention (Wenner & Campbell, 2017; Harris,2003; York-Barr & Duke, 2004). The implementation of teacher leadership can not only improve teaching management, but also positively influence school decisions and district policies by creating a dynamic and innovative educational environment, thereby improving student performance (Martin & Coleman, 2011; Muijs & Harris, 2006; Bellibaş et al., 2020).

Distributed leadership and teacher leadership are often viewed as complementary leadership models in the educational context（Harris, 2003; Nguyen et al.,2020）. Distributed leadership provides a framework where leadership tasks are spread across multiple members of the organization, while teacher leadership focuses on empowering educators to take on leadership roles within the classroom and the broader school community. As such, the interplay between these two forms of leadership can result in enhanced organizational capacity, as teachers are empowered to take ownership of both instructional and administrative responsibilities (Printy & Liu, 2021). This theoretical connection underscores the importance of examining how the hierarchical structure of the education system and leadership approaches in China can support distributed leadership. In the Chinese context, hierarchical structures emphasize clear roles, responsibilities, and top-down authority, which can provide a stable foundation for implementing distributed leadership (Tian, 2016). Principals, as key figures in this system, can strategically delegate authority and empower teachers by distributing decision-making responsibilities while maintaining oversight (Bellibaş et al., 2020). Additionally, the collective culture in Chinese schools encourages collaboration and shared goals, which aligns with the principles of distributed leadership. By leveraging these hierarchical frameworks to establish trust and support, schools can transition toward more inclusive leadership models that facilitate the emergence and practice of teacher leadership (Murphy & Brennan, 2024).

Although the construct of teacher leadership emanated from a Western educational milieu, its relevance has become increasingly apparent within the communal endeavors routinely executed within Chinese educational entities (Zheng et al., 2018). Moreover, the stratified architecture of the Chinese educational framework—spanning class, grade, school, district, municipality, province, and so forth—underpins a multitude of pedagogical and research

mechanisms. Within this hierarchical structure, seasoned educators engage in cooperative ventures with fledgling teachers, fostering the emergence of myriad informal leaders, thereby nurturing an environment conducive to the cultivation of teacher leadership in academic settings (Wong, 2010; Zhang & Pang, 2016).

Despite the scholarly interest in the interplay between teacher leadership and distributed leadership, significant gaps remain, particularly in the Chinese educational context (Xie et al., 2021). The praxis of teacher leadership in secondary schools diverges markedly from other echelons of education, particularly with respect to school climate, university matriculation rates, and student academic performance (Sebastian et al., 2017). Thus, examining teacher leadership in the secondary school context in China is pivotal for gaining empirical evidence from the vantage point of distributed leadership. This study endeavors to bridge a critical gap in the leadership literature pertinent to secondary school educators.

In the Chinese education system, cultural values such as collectivism, respect for authority, and the emphasis on academic performance shape the leadership dynamics within schools (Shengnan & Hallinger, 2021). These values often result in a top-down leadership structure, where principals and administrators play a central role in decision-making. However, recent educational reforms in China have begun to promote more collaborative forms of leadership, reflecting a shift towards empowering teachers to take on leadership role （Chen & Zhang, 2024）. This transformation presents a unique opportunity to examine how distributed leadership, traditionally associated with Western educational systems, can be adapted and implemented within the Chinese cultural context.

This study aims to explore the impact of distributed leadership on teacher leadership in Chinese secondary schools, with a focus on constructing a structural model to address the following questions:

(1)Is distributed leadership significantly associated with teacher leadership in Chinese secondary schools?
(2)Are there differences in the association between distributed leadership and the various dimensions of teacher leadership?

This study, drawing from a survey of 425 secondary school educators across various regions in southern China, employed a structural equation model for quantitative analysis to ascertain the mechanisms by which distributed leadership fosters the praxis of teacher leadership within Chinese secondary schools.

Literature Review

Distributed Leadership

Distributed leadership is a widely discussed concept in the field of education, emphasizing the decentralization of leadership and collective actions among team members (Spillane, 2005). Gronn (2000) highlighted the collective nature of organizations, asserting that each member plays a significant role as a leader. Harris (2011) posited that multiple teachers in a school can assume leadership roles and responsibilities, regardless of official recognition, to achieve common goals and create synergistic effects.

Furthermore, distributed leadership challenges traditional hierarchical leadership models,

advocating a more collaborative approach that is believed to foster innovation and adaptability in educational settings (Nadeem, 2024). By distributing leadership responsibilities, schools are better positioned to respond to dynamic changes in educational demands, enabling a more flexible and responsive learning environment (Brown et al., 2022). This shared leadership approach empowers teachers, leading to increased engagement, professional development, and ownership of school goals (Kilag et al., 2023).

In educational practice, the implementation of distributed leadership is closely related to school culture, teacher professional development, student achievement, teacher cooperation, principal trust, and commitment (Printy & Liu, 2021; Zheng et al., 2019). Hulpia et al., (2009) found that distributed leadership had a significant impact on teachers' job satisfaction by analyzing school leaders' views on leadership teamwork, leadership function allocation, and participatory decision-making. Studies have shown that the implementation of distributed leadership is influenced by national policies and school culture, and that these factors are crucial to the promotion of distributed leadership (Printy & Liu, 2021).

Moreover, research highlights that distributed leadership not only improves teacher satisfaction but also strengthens organizational resilience and adaptability (Limon, Dilekç & Demirer, 2021). As teachers assume leadership roles, they contribute to shaping school policies and educational strategies, aligning them more closely with the needs of students and the broader community (Alkrdem, 2020). This approach facilitates more sustainable educational reform and enhances overall school performance (Bellibaş et al., 2021).

Diverse scholars have proffered varied models of distributed leadership praxis. Spillane (2005) articulates a conceptual schema that accentuates the foundational elements of leaders, followers, and the contexts of execution. Malloy and Leithwood (2017) have delineated four paradigms of distributed leadership dispersion through extensive scrutiny and inquiry: orchestrated alignment, spontaneous accord, spontaneous discord, and anarchic disarray. The framework advanced by Leithwood et al. (2007) specifically targets the quartet of principalship dimensions within distributed leadership: charting the school's trajectory, nurturing the professional cadre, reconfiguring the organizational architecture, and stewarding pedagogical protocols. These dimensions are regarded as the linchpins of distributed leadership enactment. Hulpia et al., (2009) have crafted a distributed leadership inventory predicated on Leithwood's paradigm to gauge the apprehensions of governance, instructional leadership, and didactic practitioners concerning leadership roles, as well as the modalities and settings for the assignment of formal leadership stations. These investigations reinforce the authenticity of the Leithwood paradigm and furnish a dependable metrical instrument for the appraisal of distributed leadership praxis (Hulpia et al., 2009).

In summary, the definition and practice of distributed leadership have multiple interpretations and applications in academia. Different models offer different perspectives for understanding and implementing distributed leadership, but together they emphasize the importance of decentralized leadership and collective action. The practical implementation of distributed leadership not only reshapes educational leadership paradigms but also aligns leadership practices with broader school goals, fostering a more cohesive and cooperative school environment (Wenner & Campbell, 2017). The model of Leithwood et al. (2007) has been widely used and recognized in the field of educational management due to its comprehensiveness and practicality.

Teacher Leadership

Teacher leadership stands as an essential catalyst and pivotal element in educational reform and pedagogical innovation, thus emerging as a focal point of interest within the educational domain (York-Barr & Duke, 2004). Scholarship indicates that the execution of teacher leadership signifies a transition from the conventional principal-centric leadership paradigm to one characterized by shared and dispersed governance (Spillane et al., 2004; Stein et al., 2016). York-Barr and Duke (2004) encapsulate teacher leadership as the capacity of educators to exert positive influence upon their peers, the school's ethos, and instructional praxis beyond the classroom confines, through either informal or formal capacities. Such influence manifests in teachers' abilities to shape instructional practices, foster a positive school climate, and encourage professional growth, all of which contribute to holistic school improvement. Muijs and Harris (2006) contend that teacher leadership transcends the traditional hierarchical role, highlighting the impact of teachers on their peers and potentially the wider educational community, and is integral to fostering a collaborative ethos, bolstering professional enhancement, and propelling curriculum and pedagogical refinement.

This paradigm shift toward shared governance has significant implications for educational innovation and reform (Kilicoglu & Kilicoglu, 2020). As teacher leaders engage in both formal and informal leadership activities, they play a crucial role in developing collaborative professional learning communities that directly contribute to improved teaching practices and student outcomes (Lee & Ip, 2023). By decentralizing leadership roles, schools are better positioned to respond to evolving educational needs, and the enhanced agency of teachers leads to a more dynamic and responsive educational environment (Pineda-Báez et al., 2020).

Scholarship reveals that the enactment of teacher leadership is inherently complex. It necessitates a nurturing organizational framework that fosters faculty agency and offers avenues for the manifestation of leadership (Little, 2003). Potent teacher leadership can catalyze professional advancement among teachers, amplify collegial collaboration, and optimize student learning achievements (Muijs & Harris, 2006). Nonetheless, the praxis of teacher leadership confronts a myriad of challenges, including role incongruities, power struggles, and the constraints of organizational culture (Little, 2003). Despite an acknowledgement of the merits of teacher leadership, the domain is replete with challenges. Discrepancies emerge when the democratic ethos of the educational vocation grapples with the hierarchical nuances of leadership positions (York-Barr & Duke, 2004).

Furthermore, challenges to teacher leadership implementation are often exacerbated by institutional constraints, such as rigid administrative structures, conflicting expectations between principals and teacher leaders, and insufficient professional development opportunities (Paletta, et al., 2020). These barriers hinder the full realization of teacher leadership potential and require systematic changes to empower educators to take on leadership roles effectively (Kasapoglu, & Karaca, 2021). Addressing these challenges is critical to ensuring that teacher leadership can thrive and contribute meaningfully to school reform efforts (Webber & Nickel, 2021).

Meanwhile, the research on teacher leadership also focuses on its impact on school organizations. Principals support teacher leadership by giving teachers the space, time, and opportunity to participate in curriculum decisions and other school matters (Cheng & Szeto, 2016; Nguyen et al., 2020; Woodhouse & Pedder, 2017). In addition, the principal's leadership style and support for teacher leadership are considered to be key factors affecting the success of teacher leadership (Gronn, 2002). The degree to which principals support the

work of teacher leaders depends on factors such as principals' leadership beliefs, principals' knowledge of teacher leadership, and how often principals interact with teacher leaders (Mangin, 2016).

Research suggests that the alignment between principals and teacher leaders is crucial for fostering a school culture that values shared leadership. Successful teacher leadership implementation is often contingent upon the degree to which school leaders advocate for collaborative decision-making and provide meaningful opportunities for teachers to exert leadership within their own classrooms and beyond (Weiner & Lamb, 2020).

To implement teacher leadership, scholars have proposed a variety of teacher leadership practice models. Berg, Carver, and Mangin (2014), through literature review and content analysis, proposed criteria for strengthening teacher leadership preparation, policy, and practice. Nudrat and Akhtar (2014) focus on outlining the necessary competencies and skills for future teacher leaders. Fairman and Mackenzie (2015) develop a conceptual model that highlights areas of action for teacher leaders in promoting professional learning.

Chen (2022) developed a comprehensive, multidimensional model of teacher leadership behavior. These dimensions were obtained through the study of mixed methods. These dimensions are Promoting Professional Learning, Focusing on the Learning Process, Encouraging Collegial Collaboration, Engaging in Decision-Making, and Liaising with External Affiliations. This model is characterized by high reliability and validity, with original dimensions and items identified through literature review and semi-structured interviews. Furthermore, the sample selection considered the context of secondary school in China, aligning with the subjects of this study. Finally, this model provides a theoretical and conceptual framework for exploring the preparation required to become a teacher leader.

The multidimensional model proposed by Chen (2022) offers a robust framework for understanding teacher leadership in a Chinese context, reflecting the unique cultural and institutional factors that shape leadership practices in Chinese schools. This model not only addresses leadership behaviors but also provides insight into how these behaviors can be nurtured through targeted professional development programs.

Secondary School in China

In China, secondary school education, as the cornerstone of training higher talents, carries important social missions and educational goals. According to Huo (2004), the Chinese secondary school education system has gone through a process from imitation to localization, and its development history is relatively short, but the change is rapid and far-reaching. This process reflects the broader trajectory of China's modernization efforts in education, where educational institutions have continuously evolved to meet the demands of an increasingly globalized world. The Chinese education model draws on the Soviet education system, emphasizing secondary school education as a preparation stage for higher education and quality labor reserves (Gao & Wu, 2018). In this model, secondary school serves as a critical juncture where students are rigorously prepared not only for university entrance but also for their future roles in a rapidly industrializing and modernizing society. Since then, Chinese secondary school education has once again turned to public education, emphasizing students' quality and personality development rather than simple academic performance (Gao & Wu, 2018). This shift mirrors the broader trend in global education reform, where holistic student development—focusing on creativity, critical thinking, and emotional intelligence—takes precedence over traditional rote learning methods (Li, 2023).

Despite changes in educational concepts, the pressure of the college entrance examination has caused secondary school students and teachers to still adhere to traditional roles. This has led to a clear gap between educational concepts, the expectations of students' parents, and societal needs. Indeed, the Gaokao (college entrance examination) exerts a profound influence on the behaviors of students and teachers, shaping the curriculum, teaching methods, and even the broader educational environment. The focus on test preparation often stifles innovation in pedagogy, further entrenching traditional educational practices (Murray et al., 2023).

The Chinese secondary school governance system has experienced a transformation from a centralized to a decentralized model. As the preeminent executive of the school, the principal's responsibilities and prerogatives are underpinned by both legislative frameworks and the institutional culture (Ministry of Education, 2012). The shift towards decentralization is consistent with broader global trends in educational governance, where schools are granted more autonomy in decision-making to foster localized, contextually appropriate solutions (Arnzen & Houston, 2023). Qian et al. (2017) suggest that, despite the onerous teaching workloads, teachers possess an intrinsic desire and impetus to engage in the governance and policy-making processes of the school. This motivation aligns with the increasing recognition of teachers' professional agency in shaping school policies and driving educational reform (Wilkins, et al., 2021). As such, teachers are not merely implementers of educational policies but active contributors to the leadership and decision-making processes within schools.

At the policy stratum, initiatives such as the Basic Education Curriculum Reform in 2001 and the Professional Standards for Principals of Compulsory Education Schools in 2003 advocate for enhanced teacher involvement in school administration, thereby offering legislative endorsement for the exercise of teacher leadership. These policies represent a significant shift towards distributed leadership, where teachers are encouraged to participate in decision-making processes, fostering a more inclusive and collaborative school governance structure (Traver-Marti et al., 2023). This legislative backing not only legitimizes teacher leadership but also provides a framework for its implementation.

Chinese secondary school education is at a crossroads, facing the collision of traditional and modern educational ideologies, as well as the challenge of educational resource allocation (Huo, 2004). The tension between maintaining academic excellence through standardized assessments like the Gaokao and embracing modern educational ideals that promote creativity, and critical thinking presents a significant challenge for policymakers and educators alike (Han, 2022 ; Guo, 2022). Additionally, disparities in educational resource distribution between urban and rural areas exacerbate the difficulties in implementing modern educational reforms, further complicating efforts to cultivate innovative leadership practices in schools (Dhaliwal & Bruno, 2021).

Future research needs to further explore how to effectively cultivate and develop teacher leadership from the perspective of distributed leadership, and how to promote the reform and development of secondary school education through teacher leadership. This is particularly significant in contexts like China, where traditional hierarchical structures often limit teachers' autonomy and leadership potential. By addressing these challenges, the research aims to provide actionable insights for transforming school leadership practices, fostering teacher empowerment, and ultimately enhancing educational equity and quality. Additionally, the issue of resource allocation, especially in underfunded rural areas, is critical for ensuring equitable access to quality education and leadership development opportunities for teachers (Doty, 2024).

Methodology

Design and Participants

This study employed a quantitative research method, collecting data through an online survey distributed to secondary school teachers in southern China. The selection of a quantitative approach aligns with the study's objective of testing hypotheses and examining the relationships between distributed leadership and teacher leadership through statistical analysis.

A total of 425 secondary school teacher questionnaires were collected. Among the respondents, 137 were male and 288 were female. The sample was determined using a stratified random sampling method to ensure representation across different school types and levels of teaching in the southern region. Firstly, schools are classified according to their regions (urban and rural), and teachers are randomly selected within these stratifications, which reflects the diverse demographic and occupational characteristics of the study group, thus enhancing the universality of the research results.

This gender distribution reflects the current demographic trends in the Chinese education sector, where female teachers tend to outnumber their male counterparts, particularly in secondary education (Ministry of Education of the People's Republic of China, 2023). The majority of the sample held academic degrees (72.07%), with 16.7% possessing associate degrees and 11.74% holding postgraduate degrees.These figures suggest a highly educated cohort, which is consistent with the growing professionalization of teaching in China (Lee, 2019). Of the respondents, 71.36% had junior or intermediate professional titles, while 28.64% held senior professional titles. Additionally, 49.53% of the respondents had over ten years of work experience. This distribution indicates that the sample includes both relatively novice teachers and experienced educators, providing a balanced view of leadership practices across different career stages.

Instrumentation

This study utilized a questionnaire survey as the primary tool for quantitative research. The questionnaire was divided into three main sections. The first section covered demographic information, including gender, work experience, professional titles, and positions. The second section comprised the Distributed Leadership Scale, which was based on the studies by Leithwood et al. (2007). This scale included four dimensions: Setting Directions (4 items, e.g., "The principal establishes a clear vision for the school"), Developing People (5 items, e.g., "The principal supports teacher professional development"), Redesigning the Organization (4 items, e.g., "The principal fosters a collaborative school culture"), and Improving Instructional Practices (4 items, e.g., "The principal promotes the use of effective teaching strategies"). The Cronbach's alpha for this scale was 0.89, indicating high reliability.

The third section involved the Teacher Leadership Practice Scale, based on Chen (2022), comprising five dimensions: Promoting Professional Learning (PPL, 5 items, e.g., "I actively engage in professional development programs"), Focusing on Learning Process (FLP, 4 items, e.g., "I monitor student progress and adapt teaching methods accordingly"), Encouraging Collegial Collaboration (ECC, 4 items, e.g., "I frequently collaborate with colleagues to address teaching challenges"), Engaging Decision-Making (EDM, 4 items, e.g., "I participate in discussions on school policies"), and Liaising with External Affiliations (LEA, 4 items,

e.g., "I establish partnerships with external organizations for educational improvement"). The Cronbach's alpha for this scale was 0.92, demonstrating excellent reliability. A five-point Likert scale was employed for all items to gather respondents' feedback, ranging from 1 (strongly disagree) to 5 (strongly agree).

Data Collection Procedure and Analysis

The quantitative data collection for this study was conducted using the online platform provided by Wenjuanxing (www.wjx.cn). This platform is commonly used for survey distribution in China and offers a reliable, efficient means of reaching a broad population of respondents (Zhang et al., 2017).After obtaining the consent of the teachers, the questionnaires were distributed, resulting in the collection of 426 responses. After reviewing these questionnaires, one invalid response was excluded, leaving a total of 425 valid responses.

SPSS 27 and Amos 26 software were utilized for the analysis of the quantitative data. SPSS was selected for its robust capabilities in performing descriptive statistics, reliability analysis, and initial exploratory data examination (Pallant, 2020).SPSS was primarily used for descriptive statistics and reliability analysis. Cronbach's alpha was calculated to assess the internal consistency of the scales, with values above 0.70 indicating acceptable reliability (Nunnally & Bernstein, 1994). Subsequently, Amos software was employed for the Structural Equation Modeling (SEM). SEM is a powerful multivariate analysis technique that allows for the simultaneous examination of multiple relationships between observed and latent variables (Kline, 2023).To demonstrate the goodness-of-fit of the SEM, the following indices were used: the chi-square statistic (χ^2/df), the Root Mean Square Error of Approximation (RMSEA), the Tucker-Lewis index (TLI), and the Comparative Fit Index (CFI). These fit indices are commonly recommended in SEM literature, with thresholds of χ^2/df < 3, CFI > 0.90, TLI > 0.90, and RMSEA < 0.08 indicating a well-fitting model (Hu & Bentler, 1999).

Results

Reliability and Construct Validity

The results (Table 1) indicated that the scales demonstrated good reliability, with Cronbach's α values ranging from 0.849 to 0.916. In accordance with Awang （2012）, this study employed a battery of goodness-of-fit indices to appraise the fit of structural equation models. The following critical values were utilized as benchmarks for the acceptability of data fitting: a Comparative Fit Index (CFI) greater than.90, a Tucker-Lewis Index (TLI) exceeding.90, a Root Mean Square Error of Approximation (RMSEA) less than.08, and a Chi-square to degrees of freedom ratio (Chisq/df) below 5.0. The construct validity of each scale was tested. The results showed that the Distributed Leadership Scale had fit indices of (χ^2/df = 2.077, RMSEA = 0.050, CFI = 0.996, TLI = 0.987). The Teacher Leadership Scale had fit indices of (χ^2/df = 4.326, RMSEA = 0.089, CFI = 0.978, TLI = 0.955). These results indicate that the fit indices for both the distributed leadership and teacher leadership Scales met or were close to the acceptable standards. Further analysis of the overall scale indicators is presented in the next section.

Descriptive Statistics and Correlations

The reliability analysis and descriptive statistics of the quantitative data yielded the following results, as illustrated in Table 1. In the descriptive statistics, Focusing on Learning

Process dimension had the highest score (Mean=3.60, SD=0.96), and Liaising with External Affiliations dimension had the lowest score (Mean=3.33, SD=0.90). Additionally, all factors were found to be significantly correlated.

Table 1. Descriptive statistics, Cronbach's α and correlation matrix

	1	2	3	4	5	6
1.DL	1.000					
2.PPL	.389**	1.000				
3.FLP	.483**	.551**	1.000			
4.ECC	.445**	.486**	.600**	1.000		
5.EDM	.468**	.610**	.573**	.523**	1.000	
6. LEA	.467**	.555**	.507**	.455**	.571**	1.000
α	.935	.892	.879	.865	.870	.849
M	3.56	3.47	3.60	3.41	3.47	3.33
SD	.76	.94	.97	.90	.95	.90

Note:**p < .01.
DL=Distributed Leadership, PPL=Promoting Professional Learning, FLP=Focusing on Learning Process, ECC=Encouraging Collegial Collaboration, Engaging, EDM=Engaging Decision-Making, LEA=Liaising with External Affiliations

SEM Results

This study constructed a structural equation model (SEM) to examine the relationships between the dimensions of distributed leadership and teacher leadership. The SEM results showed that the model demonstrated good data fit ($\chi^2/df = 2.498$, RMSEA = 0.058, CFI = 0.93, TLI = 0.92) which meets the criteria suggested by Awang (2012), as shown in Figure 1.

The findings revealed that distributed leadership was significantly correlated with all dimensions of teacher leadership, with standardized beta coefficients ranging from 0.69 to 0.77. Specifically, distributed leadership was positively associated with all dimensions of teacher leadership, with the strongest correlation observed in Engaging Decision-Making (β= 0.77, $p < 0.01$). This aligns with prior studies, such as Leithwood et al. (2007), which emphasize the importance of participative decision-making in distributed leadership frameworks.

Conversely, Promoting Professional Learning (β= 0.67, $p < 0.01$) and Encouraging Collegial Collaboration (β= 0.69, $p < 0.01$) were relatively less correlated with distributed leadership. This may reflect challenges in effectively fostering professional learning communities and collegial networks within hierarchical school structures, as noted by Harris (2014).

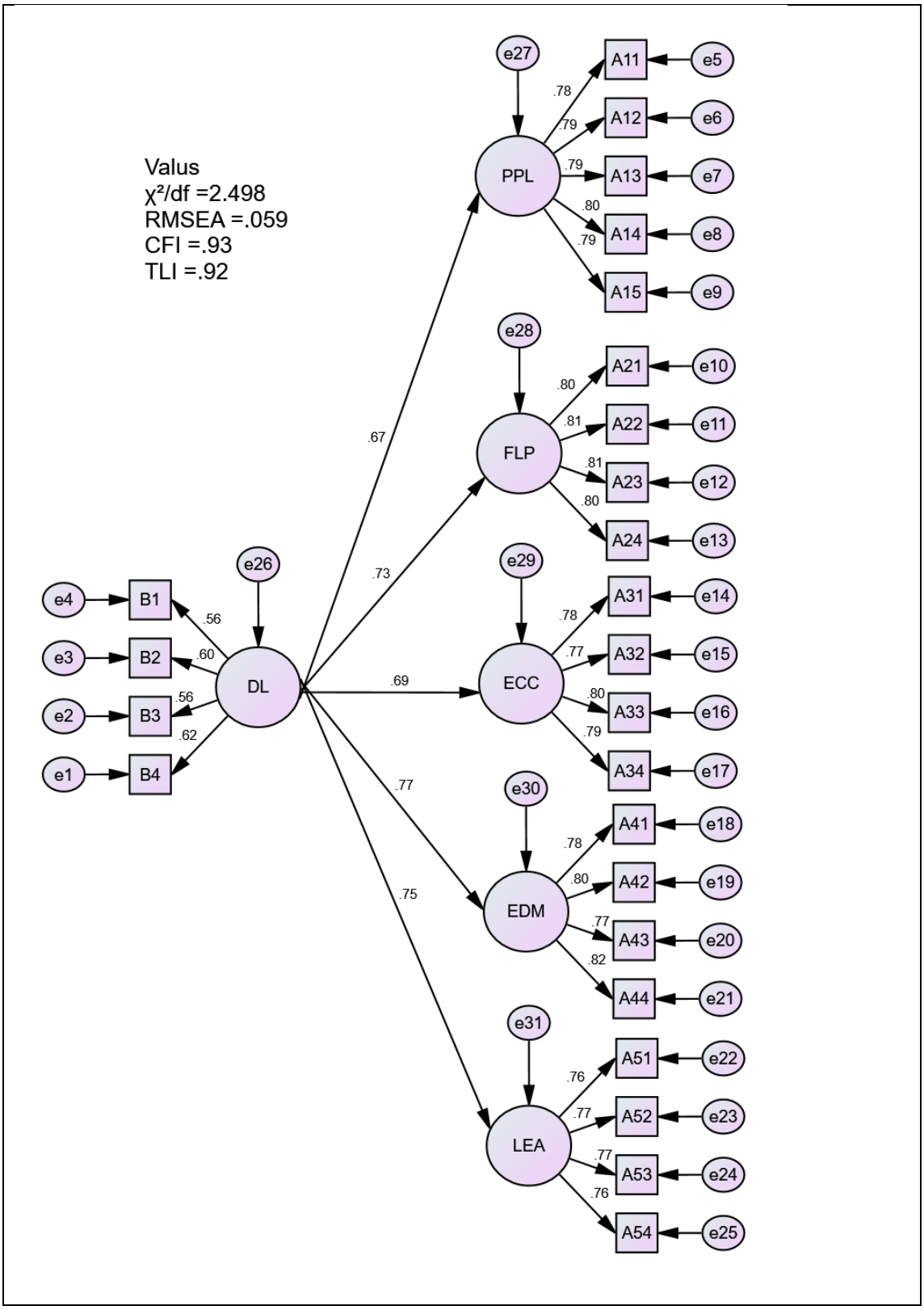

Figure 1. The Effects of Distributed Leadership on Teacher leadership Dimensions

DL=Distributed Leadership, PPL=Promoting Professional Learning, FLP=Focusing on Learning Process, ECC=Encouraging Collegial Collaboration, Engaging, EDM=Decision-Making, LEA=Liaising with External Affiliations DL=Distributed Leadership

Discussion

While certain studies have asserted that distributed leadership exerts a salutary influence on the enactment of teacher leadership and is operationalized within school administration (Wenner & Campbell, 2017; Nguyen et al., 2020), cultural discrepancies exist in the execution of distributed leadership across various nations, necessitating a prudent approach to its implementation (Tian, 2016). In China, limited studies focus on teacher leadership in secondary schools, particularly from a distributed leadership perspective. This study uses a quantitative approach to explore the relationship between distributed leadership and the dimensions of teacher leadership, offering insights into their associations.

Consistent with previous scholarly works (Leithwood et al., 2007; Wenner & Campbell, 2017; Zheng et al., 2019; Chen, 2022), the findings of this inquiry substantiate the positive influence of distributed leadership on the quintet of dimensions underpinning teacher leadership. These data corroborate the perspective articulated by Leithwood et al. (2007), demonstrating that distributed leadership is instrumental in fostering the praxis of teacher leadership, with particular salience at the secondary school level.

In China, research on teacher leadership has mainly focused on early childhood and primary education (Chen, 2022; Liang & Wang, 2019; Liu & Hallinger, 2018 ; Wang & Ho, 2020 ; Wang & Xia, 2022; Ho & Tikly, 2012 ; Wan et al., 2020). Limited attention has been given to secondary schools, with some studies highlighting how middle school principals' roles, such as power distribution and leadership cultivation, shape teacher leadership practices (Liu et al., 2021). These findings are supported by the data in this study.Chen (2022) developed an inventory for teacher leadership specific to secondary schools in China. Building upon this groundwork, the present study undertook an empirical examination from the vantage point of distributed leadership, substantiating the feasibility and effectiveness of the five dimensions of dimensions of the research model in the practice of teacher leadership, as evidenced by the quantitative data.

The literature posits that distributed leadership exerts a positive influence on teachers' professional development (Harris,2003; du Plessis & Eberlein, 2018), a finding that is corroborated by the results of this study. This suggests that the enhancement of teachers' professional capacities facilitates the swift establishment of authority among teacher cohorts, thereby conferring the leadership status and indirectly fostering the growth of teacher leadership (Tahir et al., 2020; Hunzicker, 2018). The outcomes of this study indicate that distributed leadership is instrumental in promoting a focus on the learning process among teachers (Kallio & Halverson, 2020). By focusing on students, teachers are enabled to refine and innovate pedagogical approaches, thereby advancing their teaching skills. The evolved teaching competencies, in turn, augment their leadership capabilities (Warren, 2021). The data substantiates the positive impact of distributed leadership on the cultivation of a collaborative culture among teachers. This finding is related to Coban and Atasoy, 2020; Torres' (2019) findings are consistent in showing that distributed leadership practices promote collaboration within schools, but their effect values are lower than the results of this study (Torres, 2019; Çoban & Atasoy, 2020). Within the collaborative process, the cooperative behaviors between informal leaders and teachers, in particular, engender an environment that is conducive to the development of teachers' leadership (Szczesiul & Huizenga, 2015; Rasberry & Mahajan, 2008).

The results of this study show that distributed leadership significantly bolsters teacher involvement in school management and decision-making (Bienefeld & Gudela, 2011; Chitpin, 2020). An increase in teachers' participation in school decision-making enables them to be more active in creating shared teaching goals and developing implementation plans to achieve them. This means that teachers have more opportunities to collaborate and take the initiative to undertake tasks in the organization, thereby exercising their personal leadership skills (Woo et al., 2022; Bellibaş et al., 2020; Ingersoll et al., 2018). The results show that distributed leadership was beneficial for maintaining connections with external institutions, especially in building stable interpersonal relationships (Gronn, 2008). While maintaining a solid interpersonal relationship on campus, teachers actively participate in the off-campus community, which can enable teachers to obtain interpersonal support and educational resources from the community, so as to enhance teachers' self-confidence in their leadership abilities and sustain professional leadership (Campbell et al., 2022; Danielson, 2006).

The study yields several implications for educational practice. Principally, the leadership of secondary school principals is of paramount importance. The execution of distributed leadership is contingent upon the principal's strategic direction, which acts as a foundational pillar for the realization of distributed leadership across school objectives, talent development, organizational structuring, and program management initiatives (Leithwood et al., 2007). Secondly, the cultivation and advancement of teacher leadership within schools should concentrate on devising policies that encourage teacher participation, engagement in students' learning trajectories, enhancement of teacher professional competencies, fostering of collaborative efforts among educators, and leveraging external resources (Chen, 2022). Ultimately, the enactment of distributed leadership profoundly influences the trajectory of teacher leadership development. In the secondary school context, it is imperative to empower educators with greater autonomy and to involve a broader cohort of teachers in the governance of school affairs, thereby augmenting their professional caliber and enabling them to actualize their personal worth through the exercise of teacher leadership, which in turn elevates the collective pedagogical standards of the institution (Gronn, 2002; Wenner & Campbell, 2017).

While distinctive and noteworthy findings have been obtained, there are still limitations in the study design and data sample. First, the male sample of the 425 participants was 137 (32.23%), and the sample did not fully represent the sex ratio distribution of secondary school teachers in China. Secondly, this study is a cross-sectional study, which cannot clearly explain the internal causal relationship. Finally, the study fails to distinguish the different opinions expressed by the different positions represented by the different roles of teachers, teacher leaders and principals. Therefore, a longitudinal study design will be adopted in future studies, which will help researchers clearly explain the specific direction of regression analysis. In addition, structured interviews or case studies are used according to the different identities of secondary school interviewees.

Conclusion

Based on the results of a survey of Chinese secondary school teachers, this study confirms that the practice of promoting teacher leadership through distributed leadership has a positive impact. This is especially true when it comes to participation in school decisions, attention to student learning, and liaising with external affiliations. It also plays a role in promoting cooperation among colleagues and professional development of teachers. In addition, the results of this study further provide empirical data for other scholars on the

implementation of distributed leadership to promote the development of teacher leadership in the context of Chinese education. Although this study has obtained meaningful results through quantitative research, there is a dearth of corresponding research on the causal relationship between distributed leadership and teacher leadership. Future research will employ a longitudinal research design to conduct qualitative research and more effective empirical studies.

Based on the findings, this study proposes several recommendations to enhance the interplay between distributed leadership and teacher leadership in secondary schools. First, principals should adopt strategic approaches to implement distributed leadership by delegating authority, fostering collaborative decision-making, and creating supportive environments that promote teacher participation in leadership roles . Second, schools should develop policies to enhance teachers' professional competencies, focusing on their engagement in learning processes, collaboration, and decision-making to build a robust leadership foundation. Third, efforts should be made to establish systematic partnerships with external institutions to secure resources and foster sustainable professional growth for teachers, thereby strengthening their leadership capabilities. Finally, addressing the challenges of resource allocation, particularly in underfunded rural areas, is essential to ensure equitable opportunities for teacher leadership development, enabling schools to leverage distributed leadership as a catalyst for educational reform and improved teaching standards.

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