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Research Article

The role of transformational leadership in professional learning communities: Empirical evidence from China

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Few existing research examines the relationship between transformational leadership and professional learning communities. This study aims to explore the relationship between transformational leadership and professional learning community components from the perspective of teachers in the Chinese context. A total of 385 primary school teachers participated in the questionnaire survey. This quantitative study used the 12-item Multifactor Leadership Questionnaire and the16-item PLC scale. The structural equation model showed a good fit. The results showed that transformational leadership had a significant positive effect on professional learning community. Moreover, it has a significant impact on all four components of PLC, namely, organizational learning, shared responsibility, reflective dialogue, de-privatized practice. Transformational leadership conflicts with Chinese Confucian culture on some core features, which provides valuable cases for research on the applicability of transformational leadership in different contexts. At the same time, it also provides empirical evidence for the study of the relationship between transformational leadership and professional learning communities.

Keywords: Transformational leadership; Professional learning community; China

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1. Introduction

Transformational leadership, a concept introduced by Burns (1978) in his seminal work "Leadership," was later expanded and refined by Bass (1985). Bass elaborated on the theory, offering a more comprehensive understanding of transformational leadership. The emergence of transformational leadership in the late 1970s was a response to the accountability measures in education (Leithwood, 1992). It embodies the capacity to effect change within organizations by inspiring followers through supportive methods to collectively pursue shared visions or organizational goals (Curtis et al., 2017). At a pivotal juncture, China is undergoing significant educational reform, as highlighted in Jiao and Liu's (2017) research. With the external landscape evolving rapidly, reform has emerged as a central focus in China's basic education sector in recent years. In 2018, the State Council of China issued the "Opinions on Deepening the Reform and Construction of the New Era Teacher Team," explicitly stating the goal of significantly enhancing teachers' comprehensive, professional, and innovative abilities by 2035, fostering thousands of educator-type teachers. In January 2024, the education sector further deployed a series of

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significant initiatives and reform pilots, including the formulation and implementation of the outline of the plan for building a strong education country, launching actions to expand and improve the quality of basic education, and implementing comprehensive reforms in higher education.

The OECD's Education at a Glance 2021 report highlights the importance of leadership in driving improvements in education and emphasizes the role of transformational leadership in fostering innovation and collaboration among educators (OECD, 2021). NCTM's Catalyzing Change series, specifically Catalyzing Change in Early Childhood and Primary Mathematics: Initiating a Critical Conversation (2020), discusses the role of leadership in fostering a culture of continuous improvement and professional growth among teachers. Transformational leadership is considered a key factor in creating a supportive environment that encourages reflective dialogue and shared responsibility (NCTM, 2020). In addition, studies suggested a positive relationship exists between transformational leadership and diverse facets of educational leadership, including team performance, attitudes towards work, and organizational learning (Thomas et al., 2020; Waruwu et al., 2020). Consequently, it has garnered widespread support in the realm of education. At present, there are still some gaps in research on transformational leadership:

Firstly, more empirical research is needed on transformational leadership in the Confucian cultural context of China. Globally, the application of transformational leadership in schools in different countries and regions is a topic of great concern. Especially in countries like China with a long Confucian cultural tradition, how to play the role of transformational leadership in this cultural context, as well as its applicability in the field of education, has always been a concern. Confucian culture prioritizes tradition, stability, and collective interests, contrasting with transformational leadership's focus on innovation, change, and individual motivation. This divergence has contributed to the underappreciation of transformational leadership in Chinese school settings. The TIMSS 2019 report discussed the role of leadership in improving educational outcomes and highlights the importance of adapting leadership styles to cultural contexts. It supports the view that transformational leadership needs to be tailored to China's Confucian cultural context (Mullis et al., 2020). This is consistent with discussions on the applicability of transformational leadership in various cultural contexts, including China.

Secondly, research on transformational leadership has always been a focus in the field of management and leadership in China. However, most of the research focuses on the field of business management, while there was relatively little research in the field of education. Taking Liu's (2018) research as an example, he found that among 195 empirical studies, Chinese scholars prefer to conduct quantitative research. However, most of these studies are related to the field of business management. There were only two studies related to educational background. In addition, in educational settings, transformational leadership proves highly effective (Leithwood & Jantzi, 2008). It has the potential to influence both student performance and the structure of schools (Allen et al., 2015; Anderson, 2017). This indicates that there is still a huge gap in the research on transformational leadership in the field of education in China, and more scholars need to invest in empirical research in this field.

Finally, existing research on the outcomes of transformational leadership primarily concentrates on exploring the correlation between transformational leadership and variables at both the individual and organizational levels. These include turnover intention, employee voice and silence, work performance, organizational commitment, job satisfaction, and employee creativity at the individual level. At the organizational level, variables such as team performance and organizational citizenship behavior are also examined in relation to transformational leadership. Despite the acknowledged importance of principals in PLC, research on the correlation between transformational leadership and professional learning communities remains scarce. Further empirical investigation into the connection between transformational leadership and PLC is warranted.

Professional learning communities play an important role in educational practice, helping to address implementation issues in the reform process, promote teacher professional development, and improve student performance (Lee & Smith, 1995; Newman & Wehlage, 1995). How to promote the construction of professional learning communities through transformational leadership, and how this relationship affects the development of schools and the professional growth of teachers, are all issues worth exploring in depth. In the context of China, this study investigates the correlation between transformational leadership and professional learning communities. Based on this, two research questions are proposed in this article:

RQ 1) What is the level of transformational leadership and professional learning communities in practice?

RQ 2) Does transformational leadership affect PLC components?

2. Literature and Hypotheses

2.1. Transformational Leadership in Chinese Context

Mackie (2014) pointed out that transformational leadership is "the process by which leaders attract and influence their followers to achieve a common vision by stimulating, innovating, and personalizing their attention abilities" (page 118). In other words, a transformational leader is described as "a leader's behavior that stimulates and motivates followers to achieve extraordinary results by improving the motivation and moral standards of the leader and his followers" (Bass, 1985).

Although there are various definitions of transformational leadership, its basic characteristics have been clearly defined: (1) Idealized influence is a key characteristic of describing a transformational leader as a role model for followers. Usually, followers perceive these leaders as individuals possessing exceptional skills, resolute determination, and stringent moral and ethical standards. They hold profound admiration, respect, and trust for such leaders, which consequently motivates them to strive towards collective objectives, transcending personal interests (Dionne et al., 2004). (2) Inspirational motivation refers to a leader guiding their followers towards the direction of the organizational vision through motivation and encouragement. In particular, these leaders motivate followers to actively engage in envisioning the future, articulate optimistic expectations for necessary actions, and exhibit unwavering dedication to a common vision.(Antonakis et al., 2003; Bass & Riggio, 2006). (3) Intellectual stimulation involves leaders challenging hypotheses and dealing with old situations in new ways to stimulate innovation and creativity among followers (Bass & Riggio, 2006; Nicholson, 2007). These leaders consistently motivate their followers to experiment with novel approaches in addressing longstanding issues. (4) Individualized consideration refers to leaders acting as mentors or coaches, paying special attention to the achievements and growth needs of each follower (Bass & Riggio, 2006; Nicholson, 2007).

Since the 1990s, transformational leadership has aroused widespread interest among scholars in various fields in China, especially in the business sector (Yu & Zhang, 2011). In contemporary China, the prevailing leadership approach among many business leaders remains "paternalistic" or "authoritarian." However, an increasing number of entrepreneurs and scholars are acknowledging the significance of this leadership style in fostering employee creativity. The authoritarian leadership style often entails heightened control and supervision, diminishing the autonomy of team members, thereby stifling their initiative and creativity in the workplace. Despite scholars acknowledging the positive influence of transformational leadership on employee creativity, this leadership approach remains uncommon in practical settings, particularly within China (Meng, 2022).

Transformational leadership has attracted attention from the education community, but traditional Chinese cultural norms still dominate, China's hierarchical system may continue to support the development of heroic leadership models (Fang, 2005). Although some Western leadership theories have been introduced into the Chinese environment, some Chinese schools

define formal leaders more as administrative officials (Wu, 2002) rather than leaders who promote decentralization, democracy, participation, and sharing (Leithwood et al., 2009). Related to this, some scholars have pointed out that in an environment of strict hierarchy, policy driven, highly decentralized power, and collectivism in China, the application of educational leadership may be quite complex. Although Chinese school principals claim that situational leadership can drive school progress, they tend to use power to drive progress in the Chinese educational environment (Çelik & Konan, 2021). In addition, empirical research on educational leadership in China is insufficient., with more emphasis on theoretical commentary (Yu & Hu, 2019).

2.2. The Consequences of Transformational Leadership

Transformational leadership exerts influence at both individual and organizational levels among employees. Firstly, retention. A significant positive correlation between employee retention and transformational leadership was observed in a survey conducted among 505 employees in small and medium-sized enterprises (Tian et al., 2020). Secondly, organizational commitment. A positive correlation between transformational leadership and both teacher professional commitment and organizational commitment was found in research involving 282 teachers in Israeli primary schools (Zadok & Benoliel, 2023). Thirdly, job performance. A self-reported survey of 524 employees concluded that transformational leadership significantly enhances job performance (Sürücü et al., 2022). Fourthly, employee creativity. A study involving 420 employees at Vietnam Telecom company demonstrated that transformational leadership indirectly impacts employee creativity through mediating variables (Nguyen et al., 2022). Fifthly, organizational performance. A significant positive correlation between transformational leadership and organizational change capacity as well as performance was discovered in another study involving 302 participants from Vietnamese enterprises (Le & Le, 2021). Sixthly, organizational learning. Research involving 280 managers in Iranian manufacturing companies highlighted the role of transformational leadership in promoting organizational learning (Noruzy et al., 2013). Lastly, organizational citizenship behavior. Results from a research study with 302 primary school teachers revealed a beneficial influence of transformational leadership on the organizational citizenship behavior of primary school educators (Setyaningsih, 2023).

In addition, Investigations into transformational leadership within the realm of education in China have been conducted. Yanzheng Li's systematic literature review in 2022 scrutinized research concerning the outcomes of transformational leadership in China (Li, 2022). A total of 14 variables were summarized and categorized into two groups: (1) teacher-level variables: including self-efficacy (Dou et al., 2017), job engagement (Mao & Tan, 2015), workplace friendship (W. Sun,2016), teachers' commitment (Li, 2010), psychological empowerment (Wang & Pan, 2014), psychological capital (Mao & Tan, 2015), and psychological contract (Li, 2019); and (2) school-level variables: person-organizational fit (Nie, 2018), comprising organizational innovation atmosphere (Hou, 2018), school climate (Wang, 2019), organizational atmosphere (Wang et al., 2013), trust within the organization (Wang & Pan, 2014), organizational innovation within schools (Chen, 2017) and perceived organizational support (Yang, 2017). In conclusion, research on the relationship between transformational leadership and professional learning communities is still limited, especially in the field of education in China.

2.3. Transformational leadership and PLC

According to Hargreaves (2003), leadership plays a critical role in ensuring the sustainability of PLCs and driving profound changes within schools. Within professional learning communities, leadership assumes a pivotal position. McLaughlin's summary (Stoll et al., 2006) emphasizes that, "Principals, for better or worse, manage school resources, establish connections with teachers and students, facilitate or hinder teachers' social interactions and leadership, and respond to broader policy contexts, shaping the allocation of resources to create conducive conditions for teacher groups." Researchers concur that it is imperative for school leaders to establish a secure and structured environment while fostering a culture of trust among staff members. Encouraging

professional collaboration is essential to initiate the sharing and critique of teaching practices, thereby optimizing student learning outcomes.

At present, various leadership styles are recognized for their significant impact on professional learning communities. Firstly, distributed leadership. Flores-Fahara et al. (2020) conducted research demonstrating that embracing distributed leadership has a beneficial impact on the integration of PLCs within educational institutions. Secondly, collaborative leadership. A study conducted in Missouri revealed that implementing collaborative leadership facilitated the establishment of professional learning communities [PLCs], fostering collaboration among school staff to enhance student learning (Burns et al., 2018). Thirdly, shared leadership. Qualitative research conducted in three middle schools in the Midwestern United States (Carpenter, 2015) concluded that to ensure a positive school culture and effective professional learning, it is imperative for school leaders to establish a supportive and shared leadership structure among teachers. This will facilitate community progress in the educational setting. Lastly, instructional leadership. A survey conducted in Belgium further confirmed the positive correlation between instructional leadership and professional learning communities (Vanblaere & Devos, 2016).

In the Chinese educational context, various leadership styles' influence on professional learning communities has been investigated. Findings from an analysis based on feedback from 3374 teachers indicate that instructional leadership significantly and directly impacts professional learning communities, mediated by teacher responsibility (Liu & Hallinger, 2022). A questionnaire survey conducted among 812 middle school teachers in northern China revealed a positive correlation between distributed leadership and professional learning communities (Xiu et al., 2022). Findings from a survey involving 3374 teachers revealed that ethical leadership has both direct and indirect significant impacts on professional learning communities by influencing teacher commitments (Liu & Yin, 2020). More research lies in examining the impact of leadership practices on PLCs, rather than specific leadership styles. For instance, findings from a survey involving 878 principals illustrated that leadership practices considerably enhance professional learning communities (Zhang et al., 2023).

In summary, empirical research examining the relationship between transformational leadership and professional learning communities remains limited. Therefore, we put forward the following hypothesis: (H) principals' transformational leadership has a positive effect on PLC components.

2.4. PLCs and Its Antecedents

As part of professional development reform, professional learning communities should eliminate teacher isolation, establish collaborative decision-making mechanisms, based on a common school vision and shared leadership, and enhance student achievement levels (Dufour, 2006; Hord & Sommers, 2008). According to Coffman (2007), Joyce and Scholes highlighted the role of professional learning communities in enhancing school culture through the cultivation and dissemination of innovative teaching skills. Additionally, research conducted by Coffman (2007), as cited from McLaughlin and Talbert, emphasized the significance of teachers collaborating to share teaching resources and reflect on their teaching experiences to foster the advancement of innovative teaching methodologies (Coffman, 2007). Sharing work and responsibilities in the school environment can promote the exchange of teaching practice knowledge and improve teaching characteristics. By analyzing student data and understanding student needs, the teaching team can make wise school decisions.

There are various factors that affect professional learning communities. Firstly, it is leadership. It has been proven that leadership is crucial for establishing, maintaining, and promoting professional learning communities. Next is the organizational structure. The democratic school structure provides an important foundation for professional communities. Through shared power relationships, democratic school structures also allow for shared experiences of living together: exchange of ideas, shared ideals, shared care, and interests (Louis et al., 1996). Once again, it's

culture. A qualitative study of three high schools in the Midwest of the United States showed that a positive campus culture is beneficial for the development of PLC (Carpenter, 2015). The fourth is the teacher. The quality, quantity, professional background, and teaching experience of teachers directly affect the teaching quality of schools. A survey investigated the impact of curriculum development policies and leadership on teacher professional learning communities (Juan, 2023). The results show that teacher behavior at the school level is the main influencing factor, with teacher cooperation awareness having the most significant impact on professional learning communities. The relationships between teachers also have an impact on professional learning communities (Juan, 2023). Finally, there is the environment. The data collected in this study are from 492 school staff in Türkiye. The results show that the experience of teachers and staff as well as the size and socio-economic status of the school seem to be the most important factors to predict the changes in the existing professional learning community (Sukru Bellibas et al., 2017).

3. Methodology

3.1. Participants

This study was conducted in the Zunyi school district in Guizhou Province, China. A total of 401 teachers participated in the survey and 385 valid questionnaires were received. All in-service teachers in Zunyi School District (excluding administrative staff and principals) were invited to participate in the survey. Specifically, female teachers accounted for 69.09% (266) and male teachers accounted for 30.91% (119). Most of them were young and middle-aged teachers, with 35.06% (135) aged 30 and below, 39.22% (151) aged 31-40, 15.84% (61) aged 41-50, and 9.87% (38) aged 51-60. Their educational background was mainly bachelor degree, accounting for 67.53% (260), 20.78% (80) of the teachers have junior college degree, 10.13% (39) of the teachers have master degree, and 1,56% (6) of the teachers have doctor degree. Teachers with teaching experience of less than three years accounted for 30.65% (118), 24.19% (93) have 4-6 years of teaching experience, 20.52% (79) have 7-15 years of teaching experience, 7.79% (30) have 16-23 years of teaching experience, and 16.88% (65) have 24 years or more of teaching experience

3.2. Instrument

A questionnaire consisting of two scales was used in this study: Multifactor Leadership Questionnaire [MLQ 5X], Professional Learning Community Scale [PLCS]. These two scales are mature scales that have been widely used and have high reliability and validity. The teachers rated each item on a five-point Likert scale ranging from “strongly agree” to “strongly disagree”.

The 12-item Multifactor Leadership Questionnaire adapted from Bass and Avolio (1995), which has been widely recognized in the fields of management and organizational behavior. This scale comprised the four facets of a PLC, namely, idealized influence (three items), inspirational motivation (three items), intellectual stimulation (three items), individual consideration (three items). MLQ 5X has been widely validated in multiple studies and different cultural contexts, so this study chose MLQ 5X as the scale for collecting data. Specifically, the Cronbach’s alpha value of MLQ 5X is usually above 0.80, indicating that it has high internal consistency and reliability (Dhammika et al., 2013), making it a standard tool for measuring transformational leadership behavior. In addition, due to its extensive validation and application, MLQ 5X has shown good applicability in different cultural contexts. Not only in Western countries, but also in studies in China and other Asian countries, it has shown good applicability. For example, the impact of transformational leadership on employees in the Chinese context (Liu & Li, 2021; Zhang & Xu, 2022). This cross-cultural applicability enables researchers to conduct comparative studies in different cultures and contexts.

A 16-item scale developed by Ho et al. (2016) was used to measure PLC (Ho et al., 2016). This scale comprised the four facets of a PLC, namely, reflective dialogue (four items), organizational learning (four items), shared responsibility (four items) and de-privatized practices (four items). This scale was developed based on research conducted by Louis et al. (2012) for the Wallace

Foundation, which has a high academic reputation and influence in the field of PLC (Louis et al., 2012). The research of Louis et al. provides a solid theoretical and empirical basis for the scale, making Ho et al.'s scale highly reliable and valid. More importantly, this scale shows good applicability in different cultural contexts. Liu and Yin's (2020) research verified the effectiveness of the scale in the Chinese educational context, and the Cronbach's alpha coefficient reached 0.97, proving that it can be applied across different cultures and educational systems (Liu & Yin, 2020). In contrast, some PLC scales may have poor applicability in different cultural contexts. In addition, this scale contains specific items and operational questions, making it easier for researchers and practitioners to apply and interpret the scale results. Therefore, this study chose the word scale as a instrument to collect data.

3.3. Data Analysis

SPSS 25.0 and AMOS 28.0 were used to analyse the data. Firstly, SPSS statistical software was used for descriptive statistics, correlation analysis and internal consistency reliability (Cronbach's alpha coefficient). Then, Amos was used for confirmatory factor analysis [CFA] to test the structural validity, convergence validity (mean variance extraction value, AVE), differential validity (square root of AVE greater than the correlation between potential variables), and composite reliability [CR] of the two scales. Finally, the relationship between transformational leadership and PLC composition is discussed by using structural equation model [SEM]. Detect whether transformational leadership has a significant impact on the components of PLC, and which components of PLC are significantly affected by transformational leadership. According to the suggestion of Kline, some standard fitting indicators are used to measure the model fitting degree in CFA and SEM analysis (Kline, 2005). Including Chi-square statistics (χ^2), RMSEA≤0.06(0.08), CFI≥0.95(0.90), GFI≥0.95(0.90) TLI≥0.95(0.90) were used as cutoff values for good (or acceptable) data fitting.

4. Results

4.1. Scale Reliability and Validity

For the PLC scale, the results showed satisfactory reliability. As shown in Table 1, the Cronbach's alpha coefficients of the four dimensions of PLC were: Organizational Learning α=.89, Shared Responsibility α=.92, Reflective Dialogue α=.90, De-privatized Practices α=.89, indicating that the PLC scale has good reliability. The AVE values of the four subscales were 0.66, 0.74, 0.71, and 0.67, respectively, which were all higher than 0.50. The CR values of the four subscales were 0.88, 0.92, 0.91, and 0.89, respectively, which were all higher than 0.70. The square roots of AVE of the four subscales were 0.81, 0.86, 0.84, and 0.82, respectively, which were all higher than correlations among the latent variables. The result suggested a satisfactory data fit: χ^2/df = 1.47(1~3), p<.001, GFI=.96(≥0.90), TLI=.99(≥0.90), CFI=.99(≥0.90), RMSEA=.034(≤0.08). Therefore, the PLC scale showed good construct validity, convergent validity, discriminant validity, and reliability.

For the MLQ scale, the results showed satisfactory reliability. As shown in Table 1, the Cronbach's alpha coefficient of the four dimensions of transformational leadership was: Idealized influence α=.84, Inspirational motivation α=.85, Intellectual stimulation α=.88, Individual consideration α=.84, indicating that the MLQ scale has good reliability. The AVE values of the four subscales were 0.64, 0.66, 0.72, and 0.64, respectively, which were all higher than 0.50. The CR values of the four subscales were 0.84, 0.86, 0.88, and 0.84, respectively, which were all higher than 0.70. The square roots of AVE of the four subscales were 0.80, 0.82, 0.85, and 0.80, respectively, which were all higher than correlations among the latent variables. The result suggested a satisfactory data fit: χ^2/df = 1.64(1~3), p<.001, GFI=.97(≥0.90), TLI=.98(≥0.90), CFI=.99(≥0.90), RMSEA=.04(≤0.08). Therefore, the MLQ scale showed good construct validity, convergent validity, discriminant validity, and reliability.

Table 1
Descriptive statistics, correlation matrix, Cronbach's a, AVE, CR, and square root of AVE

	OL	*SR*	*RD*	*DP*	*II*	*IM*	*IS*	*IC*
OL	1							
SR	.52**	1						
RD	.50**	.53**	1					
DP	.50**	.48**	.55**	1				
II	.17**	.22**	.17**	.20**	1			
IM	.28**	.31**	.26**	.25**	.47**	1		
IS	.23**	.24**	.22**	.23**	.50**	.42**	1	
IC	.22**	.23**	.28**	.31**	.48**	.42**	.43**	1
M	3.64	3.59	3.54	3.70	3.56	3.72	3.70	3.71
SD	1.05	1.08	1.02	1.06	1.04	1.10	.96	1.04
α	.89	.92	.90	.89	.84	.85	.88	.84
AVE	.66	.74	.71	.67	.64	.66	.72	.64
CR	.88	.92	.91	.89	.84	.86	.88	.84
Square Root of AVE	.81	.86	.84	.82	.80	.82	.85	.80

Note. ***p < .001; Std= Standardized regression weight estimates; Along the diagonal is the square root of AVE. DP=De-privatized Practices; RD=Reflective Dialogue; SR=Shared Responsibility; OL=Organizational Learning; II=Idealized influence; IM=Inspirational motivation; IS=Intellectual stimulation; IC=Individual consideration.

For the MLQ scale, the results showed satisfactory reliability. As shown in Table 1, the Cronbach's alpha coefficient of the four dimensions of transformational leadership was: Idealized influence α=.84, Inspirational motivation α=.85, Intellectual stimulation α=.88, Individual consideration α=.84, indicating that the MLQ scale has good reliability. The AVE values of the four subscales were 0.64, 0.66, 0.72, and 0.64, respectively, which were all higher than 0.50. The CR values of the four subscales were 0.84, 0.86, 0.88, and 0.84, respectively, which were all higher than 0.70. The square roots of AVE of the four subscales were 0.80, 0.82, 0.85, and 0.80, respectively, which were all higher than correlations among the latent variables. The result suggested a satisfactory data fit: χ^2/df=1.64(1~3), p <.001, GFI=.97(≥0.90), TLI=.98(≥0.90), CFI=.99(≥0.90), RMSEA=.04(≤0.08). Therefore, the MLQ scale showed good construct validity, convergent validity, discriminant validity, and reliability.

4.2. Descriptive Statistics and Correlations

The descriptive statistics of all of the factors are displayed in Table 1. On the average of the four dimensions of professional learning community, de-privatized practices scored the highest (M=3.70, SD=1.06), followed by organizational learning (M=3.64, SD=1.05), and shared responsibility (M =3.59, SD=1.08), while reflective dialogue scored the lowest (M=3.54, SD=1.02). And on the average of the four dimensions of transformational leadership, inspirational motivation scored the highest (M =3.72, SD=1.10), followed by Individual consideration (M=3.71, SD=1.04), and Intellectual stimulation (M =3.70, SD=0.96), while Idealized influence scored the lowest (M=3.56, SD=1.04). In addition, there was a significant correlation between the eight variables.

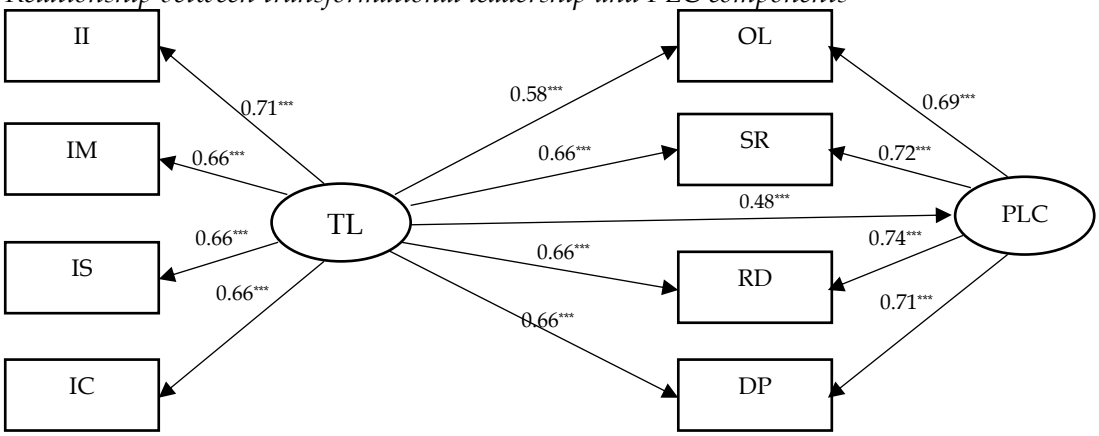
4.3. SEM Results

A model was developed to examine the relationship between transformational leadership and PLC components. The SEM results showed that the model had good data fitting: χ^2=26.786, df=20, p<.001, NFI=0.97, CFI=0.99, TLI=0.99, RMSEA=0.033. The SEM analysis results are shown in Figure 1.

The results showed that transformational leadership significantly affect professional learning communities. Standardized Regression Weights was β=0.48 (p<.001). This indicates that schools and principals adopting transformational leadership can effectively promote the establishment and development of professional learning communities in schools. Therefore, H was supported.

Figure 1

Relationship between transformational leadership and PLC components



Note. ***p<.001; TL= Transformational Leadership; DP=De-privatized Practices; RD=Reflective Dialogue; SR=Shared Responsibility; OL=Organizational Learning; II=Idealized influence; IM=Inspirational motivation; IS=Intellectual stimulation; IC=Individual consideration.

In addition, results showed that transformational leadership had a significant and positive effect on all the four components of PLCs, specifically organizational learning (β=0.58, p<.001), shared responsibility (β=0.66, p<.001), reflective dialogue (β=0.66, p<.001), de-privatized practice (β=0.66, p <.001). This indicates that the transformational leadership of principals can significantly promote the development of PLC in promoting collective learning, cultivating teachers, optimizing organizations, and other aspects. This includes developing a shared vision and responsibility among teachers, strengthening their collaboration and collaborative learning. At the same time, transformational leadership also helps promote shared personal practices and reflective dialogue.

5. Discussion

The purpose of this study was to examine the relationship between transformational leadership and PLC components in the context of Chinese Confucian culture. The unique cultural background of China provides valuable cases for the study of transformational leadership, and expands the research on the impact of transformational leadership on the organizational level of schools, namely the impact on PLC components. The research results are discussed in the following aspects.

5.1. The Level of Transformational Leadership and PLC in Practice in China

In the practice of Zunyi School District, the level of transformational leadership is assessed to be medium to high (M=3.67). This suggests that transformational leadership has been moderately applied within the district. These findings align with prior studies. For instance, a survey involving 339 primary and secondary school teachers in China (Tsang et al., 2022) reported a medium-to-high level of transformational leadership in practice (M=3.56). Similarly, research conducted in Shanghai (Zhang et al., 2022) indicated a high level of transformational leadership implementation (M=4.34). This underscores the impact of the social environment on the adoption of transformational leadership, with economically developed regions fostering a culture of equality and collaboration, thereby facilitating its implementation. Conversely, economically underdeveloped areas tend to exhibit a prevalence of traditional conservative culture, along with hierarchical systems and authoritarian leadership styles, which impede the application of transformational leadership. Additionally, a study involving 260 primary school teachers in Argentina (Sánchez Rosas et al., 2023) revealed a moderate-to-high level of transformational leadership in practice (M=3.25). In South Korea, based on data from 535 managers in a financial company (Jun & Lee, 2023), transformational leadership is categorized as medium-high.

The findings of this research indicated a medium-high level of PLC implementation in primary schools within the Zunyi School District (M=3.62). It suggests that various elements of PLC have been moderately utilized in Chinese school settings, which is basically consistent with the results of previous surveys. For instance, a survey involving teachers in Shanghai depicted a practice-level PLC rating of M=4.33 on a Likert-6 scale, indicating a medium-high level (Zhang & Pang, 2016). Another study from four more developed provinces in China illustrated a PLC implementation level of M=4.28 (Zheng, 2018). These findings further affirm that schools endowed with adequate resources (financial, material, and infrastructural) are more inclined to foster robust professional learning communities (Kilbane, 2009). In addition, the results are similar to those in other countries. A study conducted in Northern Illinois revealed a medium-to-high level of PLC implementation (M=3.48) (Schlichter, 2015), while in Malaysia, it was reported to be at a high level (M=4.79) (Khan et al., 2021).

5.2. The Impact of Transformational Leadership on PLC Components

The findings of this study suggested that all four aspects of PLC (organizational learning, shared responsibility, reflective dialogue, de-privatized practice) are significantly influenced by transformational leadership. This is consistent with previous research findings (Hallinger et al., 2014; Luyten & Bazo, 2019). This suggests that transformational leadership plays a key role in organizational learning, shared responsibility, reflective dialogue, and depersonalizing practices.

Leaders promote organizational learning and development through motivation and guidance, while shaping a culture of shared responsibility and encouraging members to support each other and cooperate. In addition, transformational leadership promotes open and honest dialogue among members, promotes the sharing of knowledge and experience, and strengthens the cohesion and learning effectiveness of the professional learning community. Finally, leaders also encourage members to share their personal teaching practices and experiences, turning them into the common wealth of the organization, thereby improving the teaching quality and effectiveness of the entire professional learning community.

This outcome validates the noteworthy influence of transformational leadership on PLC. However, owing to varying environments, the effect of transformational leadership on PLC components displays inconsistency. For example, a study involving 992 teachers showed that principals' transformational leadership has an important impact on teacher team learning (Bouwmans et al., 2017). A survey of 495 teachers in Belgian primary schools showed that transformational leadership is related to collective responsibility and reflective dialogue. Zhang's study verified that within the Chinese context, transformational leadership influences every aspect of PLC (Zhang et al., 2022).

6. Conclusions and Implications

6.1. Conclusions

Firstly, our findings underscore the pivotal role of transformational leadership in fostering the establishment and growth of professional learning communities. Leaders can effectively enhance the cohesion and learning effectiveness of PLCs by stimulating member participation and cooperation, promoting internal learning and innovation within the organization. To achieve this goal, leaders need to actively promote open communication and reflective dialogue, encourage members to share experiences and teaching methods, and foster knowledge sharing and learning. These actions are supported by recent research indicating that transformational leadership positively influences PLCs by fostering a collaborative and innovative environment (Thoonen et al., 2011; Wang et al., 2022).

Secondly, due to China's unique Confucian culture emphasizing authority and collectivism, as well as the rigid organizational structure and bureaucracy, implementing transformational leadership in Chinese school practice presents challenges. Transformational leadership emphasizes individual encouragement and participation, as well as breaking through existing systems and regulations, which can introduce uncertainty and risk for organizational change drivers, conflicting with traditional cultural values. However, current research has found that transformational leadership models are making progress at a slow pace in China. Studies by Liu and Li (2021) and Zhang et al. (2023) suggest that adapting transformational leadership to align with traditional Chinese values, such as integrity, responsibility, and loyalty, can promote its acceptance and effectiveness.

6.2. Implications

The implications of our study for school leaders and educators in China and similar contexts highlight the importance of transformational leadership for job satisfaction and the development of PLCs. Leaders should emphasize open communication, reflective dialogue, and shared responsibility to enhance teacher satisfaction and PLC effectiveness (Sun & Leithwood, 2021). Establishing a transparent and open organizational culture, encouraging employee participation in decision-making and innovation, and fostering mutual support among members are essential strategies for overcoming cultural and structural challenges in implementing transformational leadership (Huang et al., 2020).

Moreover, to successfully implement transformational leadership in China, leaders need to integrate traditional cultural values into their leadership practices. This includes leveraging values such as integrity, responsibility, and loyalty to promote change acceptance and support among

teachers. Additionally, leaders should focus on building trust and reducing uncertainty during the change process by strengthening communication with employees and involving them in decision-making (Chen & Liu, 2022). Developing transformation strategies and methods that align with Chinese cultural values and organizational contexts can enhance the success rate of transformational initiatives.

6.3. Limitations and Future Research

Initially, the representativeness of the sample was restricted due to the utilization of convenient sampling, despite the study being conducted within a highly active specialty area. Subsequent research endeavors ought to substantiate the existing findings through the employment of more rigorous sampling techniques, such as stratified random sampling. Additionally, this study solely employs quantitative methodologies to assess the perspectives of educators. Future investigations could delve deeper into the correlation between professional learning communities and teacher job satisfaction by adopting an integrated and qualitative approach. Lastly, it is plausible that a minority of interviewees may refrain from providing candid responses, particularly concerning the evaluation of the principal.

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