The Relationships among Transformational Leadership, Organizational Citizenship Behavior and School Effectiveness: An Application of Meta-analysis and Structure Equation Modeling

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Abstract. This study explores the relationships between principals' transformational leadership, teachers' organizational citizenship behavior, and school effectiveness, to provide valuable insights for education policymakers and school operators. We conducted this study because principal leadership significantly affects teachers and school effectiveness. We utilized meta-analysis and structural equation modeling techniques to comprehensively analyze principals' leadership behavior in primary and secondary schools, involving 2609 principals and 3770 teacher samples. The results showed that: 1) there is a significant positive relationship between transformational leadership and school effectiveness; 2) there is a significant positive relationship between transformational leadership and teachers' organizational citizenship behavior; 3) There is a significant positive relationship between teachers' organizational citizenship behavior and school effectiveness.；and 4) teachers' organizational citizenship behavior mediates the relationship between principals' transformational leadership and school effectiveness. This study's significant contribution lies in identifying the importance of teachers' organizational citizenship behavior in connecting principals' transformational leadership and school effectiveness and the proposal to improve teachers' organizational citizenship behavior as a critical factor in enhancing school effectiveness through principal transformational leadership. Future research could expand the sample to different educational stages and employ other statistical methods such as random-effects models, multilevel modeling, or network analysis to validate our results' universality and apply our findings to practical and theoretical contexts.

Keywords: Transformational leadership, organizational citizenship behavior, school effectiveness

1. Introduction

Effective principals are crucial to school effectiveness (Murphy, Hallinger, & Mesa, 1985). As the driving force behind the implementation of national education policies, principals play a vital role in shaping a school's vision and improving educational goals. While teachers are the primary factor in students' learning effectiveness, principal leadership is second in importance, with high-efficiency leadership having a more significant impact on schools in need of aid (Louis et al., 2010). Therefore, principal leadership is crucial in educational management, affecting the entire school. The National Policy Board for Educational Administration has updated its policies to reflect the changing expectations of the principal's role (NPBEA, 2015). The updated guidelines emphasize the principal's ability to transform beliefs, attitudes, and values and inspire teachers to lead innovative thinking and promote knowledge, which echoes the research orientation of "transformational leadership" in leadership studies.

2. Literature review

This literature review aims is to delve deeply into the concept of transformational leadership and its related research, as well as the theoretical basis of teachers' organizational citizenship behavior and school effectiveness. By examining these aspects, this literature review aims understand better how transformational leadership impacts teacher satisfaction, school performance, and overall growth, as well as the complex interplay between transformational leadership, teachers' organizational citizenship behavior, and school effectiveness in the educational domain.

2.1. The Implications of Transformational Leadership and Related Research

Transformational leadership is a leadership style that encourages team members to pursue higher levels of achievement by stimulating their innovative thinking, values, and moral standards to accomplish common organizational goals. This transformational leadership is a leadership style that aims to induce state changes in an organization's team members. It involves reorganizing, rebuilding, and rearranging a system, resulting in a heterogeneous state. The concept was first introduced by Downton in 1973 (Downton, 1973) and further developed by Burns and Bass. Transformational leaders stimulate subordinates' intrinsic motivation and satisfaction, establish personal charisma and ideals, enhance members' wisdom, and motivate them toward a common goal. The role of positive leaders in improving members' self-actualization needs and moral standards for group benefit is also emphasized (Bass & Avolio, 2000).

Recent studies have explored transformational leadership's impact on organizational and employee effectiveness, confirming that it improves employee self-efficacy (Griffin, 2003) and organizational performance (Wang & Sung, 2016; Gong & Farh,2009). Charismatic, transformational leaders enhance subordinates' self-awareness and intrinsic motivation, addressing basic needs and inspiring personal growth (Robbins, 2001). Taiwanese scholars have extensively studied transformational leadership, emphasizing its role in enhancing shared goals between leaders and members, fostering commitment and goal achievement, and promoting organizational transformation and innovation. *Transformational leadership* is an advanced innovation process that effectively utilizes and improves corporate human resources, positively impacting sustainable development (Thomsen & Oort,2016).

Overall, the more transformational leadership behaviors leaders exhibit, the more likely members will identify with them and demonstrate increased enthusiasm, sacrifice, and dedication (Yu, 2019). However, despite limited research in mainland China, there is still potential for transformational leadership to be studied and applied more widely, given its significant benefits for organizational and employee effectiveness. It is worth noting that the adaptation of transformational leadership to changes in the workplace can be slow. To overcome these challenges, we need a supporting concept (Akbar Hariputra et al., 2023).

2.2.   Theoretical Basis of Teachers' Organizational Citizenship Behavior.

In an organization, people are considered the most important resource. Organizations recruit people to work for the organization's development goals. On the contrary, people are the decisive force to the existence and development of the organization (Huynh, 2022). *Organizational citizenship behavior* (OCB) refers to voluntary actions that exceed job requirements, providing benefits to the organization and its members. This behavior is rooted in social exchange theory and individual positive affect, and is driven by anticipated future rewards and norms of reciprocity, rather than immediate incentives or sanctions. OCB showcases a commitment to the organization and its members by going above and beyond the typical expectations of one's job duties. Yukl (1999) states that trust in the organization and its leaders catalyzes OCB. Scholars have noted the significance of OCB in both business and education fields. For example, Podsakoff and MacKenzie (1997) found that OCB can enhance the organization's overall performance, and Thomsen et al. (2016) emphasized that voluntary behaviors beyond prescribed work contribute to the school's growth. Teachers' OCB can improve overall school effectiveness in the education sector, promoting school development and efficiency. DiPaola and Tschannen-Moran (2001) applied the concept of OCB to education, finding that teachers' OCB can improve overall school effectiveness. Nasra, M. A., & Arar (2020) defined teachers' OCB as voluntary behaviors that benefit school members without rewards or norms, promoting school development and efficiency. Robinson, & Morrison, (1995) also discussed the importance of OCB in teaching, while Dagli and Averbek (2017) and Akar (2019) agreed that going beyond formal roles can enhance efficiency and help achieve educational goals.

Furthermore, scholars such as Somech and Khotaba (2017) and Alanoglu and Demirtas (2016) believe that teachers' OCB is crucial for school development, improving educational outcomes, and maintaining the school team's operation. Many scholars believe teachers' OCB is crucial for school development, improving educational outcomes, and maintaining the school team's operation. DiPaola and Tschannen-Moran (2001) found that teachers' OCB can improve overall school effectiveness. Liao Dawei (2005) defined teachers' OCB as voluntary behaviors that benefit school members without rewards or norms. Thomsen et al. (2016) emphasized that voluntary behaviors beyond prescribed work contribute to the school's growth. Somech and Khotaba (2017) highlighted that such behaviors could coordinate organizational operations and improve effectiveness. Dagli and Averbek (2017) and Akar (2018) agreed that going beyond formal roles can enhance efficiency and help achieve educational goals. In summary, teachers' OCB is a valuable asset for schools, promoting school operation and overall growth.

2.3.   Theory and Research of School Effectiveness.

School effectiveness research began in the 1950s and 1960s in the United States to address racial segregation and equal educational opportunities (Bai Yifang, 2000). Coleman et al. (1966) conducted a landmark study that collected data on 645,000 public school children's test scores, race, color, religion, and nationality, publishing the influential "Equality of Educational Opportunity" report, which sparked the development of school effectiveness research in education.

Initially, school effectiveness research focused on enhancing students' learning achievements, such as reading and math. However, over time, perspectives on teacher effectiveness and parent involvement were added to the research (Xie Chuanchong, Chen Ailing, 2015). Purkey and Smith (1983) identified multiple factors contributing to school effectiveness, such as principal leadership, organizational climate, curriculum, teaching, culture, and values. Barberio (1990) defined *school effectiveness* as integrating and coordinating internal and external environments, efficient resource utilization, goal achievement, and member satisfaction. Choudhary & Philip (2016) emphasized adapting to constraints and meeting diverse goals, while Grift and Houtveen (2006) focused on goal attainment, overall performance, and potential functions.

It is crucial to distinguish between "effectiveness" and "efficiency" in school effectiveness research, as they are similar but different concepts often used interchangeably. Robbins (2001) defined effectiveness as achieving organizational goals, while efficiency pertains to the efficacy with which objectives are

achieved.

Overall, ss refers to the degree to which school organization goals are achieved. This involves leaders combining the wisdom and efforts of all members to achieve educational goals and maintain adaptability amidst social changes (Hargreaves,2001).

Based on the literature review, it is evident that there is a research gap in the study of the relationships among transformational leadership, teachers' organizational citizenship behavior, and school effectiveness. Firstly, in the research on transformational leadership, although its impact on organizational and employee effectiveness has been explored, research in mainland China still needs to be expande, with the potential for further investigation and application. Secondly, regarding the theoretical basis of teachers' organizational citizenship behavior, scholars have recognized its importance in promoting school operation and overall growth. However further research is needed on to stimulate better and utilize these behaviors to improve school effectiveness. Lastly, in the theory and research of school effectiveness, although scholars have proposed various influencing factors, there is still a need to delve deeper into the interactions between these factors and how to integrate and coordinate internal and external environments to enhance school effectiveness.

Therefore, this study aims to address these research gaps by examining the relationships among principals' transformational leadership, teachers' organizational citizenship behavior, and school effectiveness. Specifically, this study will employ meta-analysis and structural equation modeling techniques to analyze how principals' transformational leadership influences teachers' organizational citizenship behavior and consequently enhances school effectiveness. Simultaneously, it will investigate how teachers' organizational citizenship behavior bridges transformational leadership and school effectiveness. This research provides valuable insights can be provided for theoretical development and practical application in the education field, and more comprehensive and in-depth foundation can be laid for related studies.

3. Research Methods and Results

The purpose of this study is to comprehensively explore the macroscopic appearance of principals' transformational leadership, teachers' organizational citizenship behavior, and school effectiveness. During the research, literature collection and discussion were carried out first, and then meta-analysis methods and structural equation models were used for quantitative statistical analysis. This chapter is divided into three sections: the first section explains the research structure and assumptions; the second section introduces the research procedures and data processing; the third section explains the statistical analysis, which is explained separately as follows.

3.1. Research Methods

Research Framework and Hypotheses This study collects journal papers on principals' transformational leadership, teachers' organizational citizenship behavior, and school effectiveness. In line with the motivation and purpose of this study, a research framework is drawn up to use meta-analysis to understand the relationship between the two variables. Through the structural equation model to explore the predictive effect among the principal's transformational leadership, teachers' organizational citizenship behavior and school effectiveness and verify the model fit, calculate the factor loadings and residuals according to the average reliability, and specify the reliability and residuals to carry out the structural equation model (structural equation model). Model, SEM) analysis. The research architecture is shown in Figure 1.
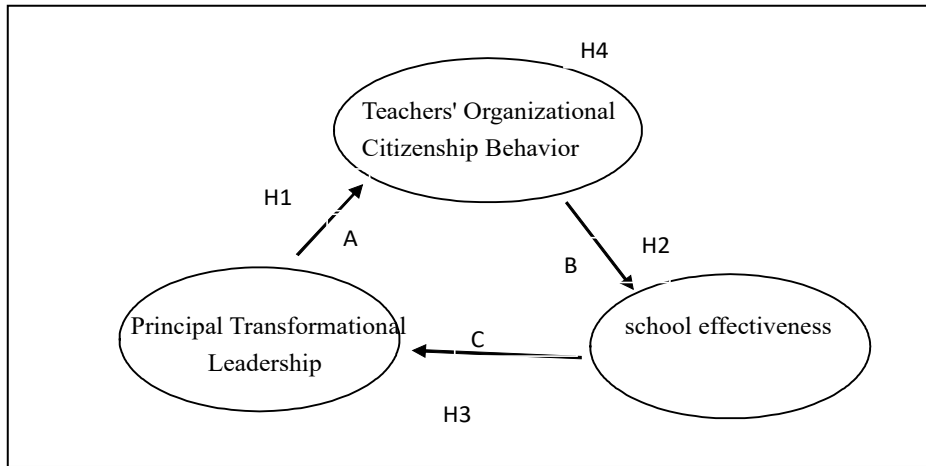
Fig.1: Research Framework Model

According to the research framework disclosed above, in order to verify the model fit between principals' transformational leadership, teachers' organizational citizenship behavior, and school effectiveness established in this study, the research hypotheses are as follows:

- H1 (Path A): Principal's transformational leadership positively and significantly impacts on teachers' organizational citizenship behavior.

- H2 (Path B): Teachers' organizational citizenship behavior positively and significantly impacts on school effectiveness.

- H3 (Path C): Principal's transformational leadership positively and significantly impactson school effectiveness.

- H4: Teachers' organizational citizenship behavior mediates the relationship between principals' transformational leadership and school effectiveness.

Research program. This study is carried out in two stages, as shown in Figure 2:
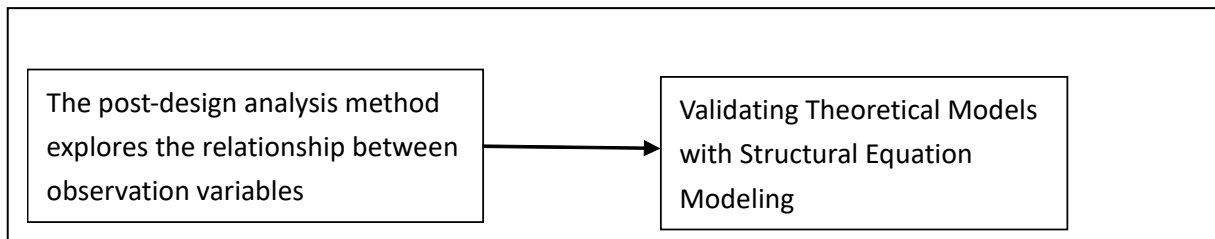

Fig.2: research stage

The first stage of this study aims to collect the correlation between the variables using meta-analysis. Individual research reports must have correlation coefficients as results. Words with only means or standard deviations will not be included. After collecting the research reports, Hunter and Schmidt (1990) and Rosenthal (1991) techniques will be applied for meta-analysis calculations to obtain correlation matrices for the next stage of theoretical verification.

Research object. This research focuses on the school field, so the research outside the school is excluded. The research object is the leadership behavior of school principals in the secondary education and national education stages, excluding kindergartens.

Data Processing. This study requires quantitative research using questionnaire surveys. Qualitative research will not be included. Instead, the research should contain correlation coefficient r values for

pairs of variables: "principal's transformational leadership and teachers' organizational behavior," "teachers' organizational citizenship behavior and school effectiveness," or "correlation between principal's transformational leadership and school effectiveness." It should also include single construct reliability α or CR and sample size. Research lacking these data will be excluded.

Methodological Limitations, Firstly, this study mainly uses questionnaire surveys for quantitative research, which may only partially cover some factors influencing principals' transformational leadership, teachers' organizational citizenship behavior, and school effectiveness. Future research may consider combining qualitative research methods, such as in-depth interviews or case studies, to obtain richer data and a deeper understanding of related concepts. Secondly, the study's focus is primarily on principals' leadership behaviors at the primary and secondary school stages, not including kindergartens. Future research could expand to different educational stages to explore whether the relationship between transformational leadership, organizational citizenship behavior, and school effectiveness is universal.

Additionally, this study employs meta-analysis methods and structural equation modeling, which may have certain model assumption limitations. Future research could use other statistical methods, such as random-effects models or multilevel modeling, to verify the robustness of the research results. Finally, there may be publication bias due to the scope of this study being limited to published literature. Future research may consider using unpublished research data to obtain more comprehensive results.

3.2. Research Results

The relationship between a principal's transformational leadership, teachers' organizational citizenship behavior, and school effectiveness

The purpose of this study is to comprehensively explore the macroscopic appearance of principals' transformational leadership, teachers' organizational citizenship behavior, and school effectiveness. During the research, literature collection and discussion were carried out first, and then meta-analysis methods and structural equation models were used for quantitative statistical analysis.

The relationship between principal's transformational leadership (A) and school effectiveness (C)

As far as the relationship between the principal's transformational leadership and school effectiveness is concerned, it can be seen from Table 1 that the weighted average effect size of the five behavioral levels of the principal's transformational leadership and the four aspects of school effectiveness ranges from .446 (establishing a vision and community support) to .446. 614 (attractive influence and administrative efficiency), and all reached the .05 significant level (the confidence intervals did not include 0). The number of samples was adjusted, the mean was calculated, and a total of 2609 samples came from 6 literature.

Table 1: Summary table of meta-analysis on the relationship between principal's transformational leadership and school effectiveness

school effectiveness transformational leadership	Administrative efficiency （C1）	teacher effectiveness（C2）	student effectiveness （C3）	community support （C4）
build a vision (A1)	.601*** [.576 .625] K=6 N=2609	.448*** [.3427 .488] K=6 N=2609	.451*** [.420 .48] K=6 N=2609	.446*** [.476 .290] K=6 N=2609
charisma influence (A2)	.614*** [.590 .538]K=6 N=2609	.453*** [.421 .483]K=6 N=2609	.467*** [.436 .496] K=6	.469*** [.439 .499]K=6 N=2609

		N=2609		
inspire (A3)	.608*** [.583 .632]K=6 N=2609	.476*** [.446 .505]K=6 N=2609	.449*** [.417 .479] K=6 N=2609	.466*** [.435 .495]K=6 N=2609
inspire intelligence (A4)	.583*** [.557 .608]K=6 N=2609	.464*** [.433 .494] K=6 N=2609	.455*** [.424 .485] K=6 N=2609	.448*** [.416 .478]K=6 N=2609
individual care (A5)	.597*** [.571 .621]K=6 N=2609	.452*** [.421 .482]K=6 N=2609	.455*** [.424 .485] K=6 N=2609	.463*** [.433 .493]K=6 N=2609

***p<.001

The relationship between principal's transformational leadership (A) and teachers' organizational citizenship behavior (B)

As far as the relationship between the principal's transformational leadership and teachers' organizational citizenship behavior is concerned, it can be seen from Table 2 that the weighted average effect size of the five behavioral levels of the principal's transformational leadership and the three behavioral levels of teachers' organizational citizenship behavior is between .250 (establishing a vision and Law-abiding) to .552 (individual care and identification organization). All reached the .05 significant level (the confidence intervals did not include 0). The number of samples was adjusted, and the mean was calculated. A total of 2028 samples came from 3 literatures.

Table 2: Summary table of meta-analysis on the relationship between principal's transformational leadership and school effectiveness

teacher organization citizen Behavior Transformational Leadership	Behavior Transformational Leadership（B1）	assist colleagues（B2）	Law-abiding（B3）
build a vision (A1)	.485*** [.485 .518] K=3 N=2028	.364*** [.326 .401] K=3 N=2028	.250*** [.208 .290] K=3 N=2028
charisma influence (A2)	.495*** [.461 .527] K=3 N=2028	.375*** [.337 .412] K=3 N=2028	.265*** [.224 .305] K=3 N=2028
inspire (A3)	.525*** [.493 .556] K=3 N=2028	.425*** [.389 .460] K=3 N=2028	.318*** [.278 .356] K=3 N=2028
inspire intelligence (A4)	.516*** [.483 .547] K=3 N=2028	.408*** [.371 .443] K=3 N=2028	.298*** [.257 .337] K=3 N=2028
individual care (A5)	.552*** [.521 .582] K=3 N=2028	.421*** [.385 .456] K=3 N=2028	.281*** [.240 .321] K=3 N=2028

***p<.001
***Summary table of meta-analysis on the relationship between teachers' organizational citizenship behavior and school effectiveness.

The relationship between teachers' organizational citizenship behavior (B) and school effectiveness (C)

In terms of the relationship between teachers' organizational citizenship behavior and school effectiveness (see Table 4-3), the weighted average effect size of the three behavioral levels of teachers' organizational citizenship behavior and the four aspects of school effectiveness ranges from .278 (devotion to law and community support) to .430 (identity organization and teacher effectiveness), and all reached the significant level of .05 (the confidence intervals did not include 0), the number of samples was adjusted, and the mean was calculated, a total of 3770 samples came from 4 literatures

Table 3: Summary table of meta-analysis on the relationship between teachers' organizational citizenship behavior and school effectiveness

transformational leadership school effectiveness	Administrative efficiency （C1）	teacher effectiveness （C2）	student effectiveness （C3）	community support （C4）
Behavior Transformational Leadership （B1）	.377*** [.349 .404] K=4 N=3770	.430*** [.403.455] K=4 N=3770	.391*** [.364 .418] K=4 N=3770	.364*** [.336 .391] K=4 N=3770
Behavior Transformational Leadership （B1）	.305*** [.276 .334] K=4 N=3770	.407*** [.380 .433] K=4 N=3770	.365*** [.337 .392] K=4 N=3770	.305*** [.276 .334] K=4 N=3770
Behavior Transformational Leadership （B1）	.301*** [.271 .330] K=4 N=3770	.324*** [.295 .353] K=4 g N=3770	.289*** [.260 .318] K=4 N=3770	.278*** [.248 .307] K=4 N=3770

***p<.001

The mediating effect model with the overall dimension of teachers' organizational citizenship behavior as the intermediary variable

After analyzing the total effects, direct effects, and indirect effects in this study, the intermediary model in Table 4 is obtained.

Type indirect effect analysis table, from Table 4 ; it can be found that in the total effect of the principal's transformational leadership (A)→school effectiveness (C), its estimated value is B=.696, SE=.008, z=87.000> 1.96, and the confidence interval does not include 0[.680,.713], [.679,.713], indicating that the total effect is established; between the principal's transformational leadership (A) → organizational citizenship behavior (B) → school effectiveness (C). In the indirect effect, its estimated value B=.285, SE=.007, z=40.714>1.96, and the confidence interval does not include 0 [.272,.298], [.272,.299], indicating that the indirect effect is established, That is, there is a mediating effect; the direct effect analysis of the principal's transformational leadership (A)→school effectiveness (C), the estimated value B=.412, SE=.008, z=51.500>1.96, and the confidence interval does not include 0 [.396,. 428], [.395,.427], indicating that the direct effect is established,

Table 4: Summary table of mediation effect analysis

	point	Product of	Monte Carlo simulation 5000 times CI

estimated effect	estimate	coefficient		bias-corrected		percentile	
		SE	z-value	Lower	Upper	Lower	Upper
indirect effect							
A□B□C	.285	.007	40.714	.272	.298	.272	.299
direct effect							
A□C	.412	.008	51.500	.396	.428	.395	.427
total effect							
A□C	.696	.008	87.000	.680	.713	.679	.713

Note: A is the principal's transformational leadership, B is organizational citizenship behavior, and C is school effectiveness

4. Discussion of Results

H1: Principal's transformational leadership positively and significantly impacts teachers' organizational* citizenship *behavior.

In this scenario, we find that the principal's transformational leadership has a positive and significant impact on teachers' organizational citizenship behavior. From a theoretical perspective, this conclusion is supported by scholars such as Bass and Riggio (2006), Leithwood and Jantzi (2005), Muijs and Harris (2003), and Schaubroeck et al. (2007). Their research shows that transformational leadership can promote positive behaviors among teachers within the organization, thus improving school effectiveness.

From a practical perspective, this conclusion is consistent with the research of Nemanich and Kearney (2007), who believe that school administrators should focus on improving the transformational leadership capabilities of principals in order to better inspire teachers' organizational citizenship behavior. At the same time, the research of Samson et al. (2012) also confirms that transformational leadership plays a positive role in promoting teachers' active participation in school affairs, thereby improving the overall quality of education in the school.

It is worth noting that some scholars have questioned this conclusion. For example, Gronn (2002) and Gunter (2001) argue that in some cases, transformational leadership may put excessive pressure on teachers, decreasing their work efficiency. In addition, some studies have found that transactional leadership is equally important for teachers (Chen et al., 2014; Gencer et al., 2015).

Therefore, while exploring the impact of transformational leadership on teachers' organizational citizenship behavior in depth, we also need to pay attention to the influence of other leadership styles on teachers in different situations and further explore teachers' feelings and experiences during the leadership process. Furthermore, future research can further explore the relationship between transformational leadership and other related variables, such as teacher job satisfaction, student learning outcomes, and school effectiveness, to more comprehensively understand the impact of transformational leadership in education.

In summary, the in-depth exploration of the conclusions of this study should take into account the views of different scholars and proceed from both practical and theoretical perspectives. Through multi-angle analysis, we can more comprehensively understand the impact of transformational leadership on teachers' organizational citizenship behavior and provide more specific guidance for school administrators and policymakers. In addition, future research can continue to explore aspects not covered in this study, such as cultural differences (Hofstede, 1984), differences in educational systems (Reynolds et al., 2014), influencing mechanisms, and differences between different types of schools (Leithwood et al., 2008), to further enrich our understanding of the relationship between principals' transformational leadership and teachers' organizational citizenship behavior. At the same time, to better

study and practice transformational leadership, future research can also focus on other fields, such as business management and government leadership. Through these explorations, we can better understand the concept and practice of transformational leadership and make more significant contributions to the development of organizations and leadership.

H2: Teachers' organizational citizenship behavior positively and significantly impacts school effectiveness.

Academic research has widely discussed the impact of teachers' organizational citizenship behavior on school effectiveness. Many scholars have explored this relationship, some supporting it and others opposing it. Bass and Avolio (1994) proposed that organizational citizenship behavior can improve performance and effectiveness. Moreover, Podsakoff et al. (2000) found a positive relationship between organizational citizenship behavior and organizational performance, further supporting the positive impact of organizational citizenship behavior on school effectiveness. Nemanich and Kearney (2007) demonstrated that organizational citizenship behavior can promote school improvement and development. Teachers' involvement in various school activities, such as helping students, participating in academic conferences, and holding leadership positions, positively impacts school effectiveness.

However, some scholars have presented different views. For example, Chang and Lee (2007) found that, in some cases, organizational citizenship behavior had no significant impact on organizational effectiveness. This suggests that the influence of organizational citizenship behavior on school effectiveness may vary depending on different environmental factors. For example, Van Dyne et al. (1995) posited that organizational citizenship behavior might create a negative relationship with organizational performance, as teachers may invest their time and energy in activities unrelated to their work, which could impede the improvement of school effectiveness.

Despite the opposing views, more scholars support the positive impact of organizational citizenship behavior on school effectiveness. From a theoretical perspective, Podsakoff et al. (2000) argued that organizational citizenship behavior can promote organizational effectiveness, which is an essential component of school effectiveness. From a practical standpoint, Nemanich and Kearney (2007) demonstrated that organizational citizenship behavior could promote school improvement and development, enhancing school effectiveness.

In conclusion, the results of this study emphasize the importance of principals' transformational leadership on school effectiveness from theoretical and practical perspectives. In future research, we suggest further exploring the relationship between transformational leadership and other related variables (such as teacher satisfaction and student engagement) to understand transformational leadership's impact on education better. For example, Muijs and Harris (2007) found a positive relationship between transformational leadership, teacher satisfaction, and student engagement, further supporting the findings of this study.

H3: Principal's transformational leadership positively and significantly impacts school effectiveness.

This study's results show a significant relationship between principals' transformational leadership and school effectiveness. From a theoretical perspective, these findings support the view of Bass and Riggio (2006) that transformational leadership has a positive impact on organizational outcomes, including school effectiveness. Moreover, Leithwood and Jantzi (2005) further explain that transformational leadership is crucial in improving school effectiveness by inspiring the potential of teachers and students, establishing a shared vision, and promoting innovation and change. In educational research, Day et al. (2016) found that transformational leadership can improve teachers' teaching quality and students' learning outcomes. From a practical perspective, the results of this study imply that school administrators and policymakers should pay attention to the cultivation and development of principals' transformational leadership. As Hallinger (2003) points out, improving principals' transformational leadership skills can help enhance school effectiveness, improving the quality of education and students' learning outcomes. Robinson (2010) also notes that principals should actively participate in educational practice to understand better and respond to the challenges faced in the education process.

The results of this study emphasize the importance of principals' transformational leadership for school effectiveness, both from theoretical and practical perspectives. In future research, we suggest further exploring the relationship between transformational leadership and other related variables (such as teacher satisfaction and student engagement) to understand the impact of transformational leadership in education more comprehensively. For example, Muijs and Harris (2007) found that transformational leadership has a positive relationship with teacher satisfaction and student engagement, further supporting the results of this study.

Furthermore, researchers can also investigate the applicability and effectiveness of transformational leadership in different cultural and educational environments. For example, Cheng (2010) points out that there may be differences in transformational leadership between Eastern and Western cultural backgrounds. Thus, cultural factors should be fully considered when formulating corresponding leadership strategies and training programs. By studying the literature of these scholars, we can better understand the importance and impact of transformational leadership in the education field. Robinson (2010) states that transitioning from directive leadership to leadership capabilities is critical to achieving educational reform and improving school effectiveness. He emphasizes that leaders must possess diverse leadership capabilities to cope with various challenges in educational practice. In future research, we suggest further in-depth exploration of the mechanisms of transformational leadership in the education field and the impact of different leadership capabilities on school effectiveness. Researchers can also focus on the influence of educational policies and systems on implementing transformational leadership, aiming to provide more targeted suggestions and guidance for practice.

Thus, the results of this study demonstrate that principals' transformational leadership significantly impacts school effectiveness. This outcome has received support from numerous scholars from both theoretical and practical perspectives. Future research should delve deeper into the application of transformational leadership in education to promote the improvement of school effectiveness and the enhancement of education quality.

H4: Teachers' organizational citizenship behavior mediates the relationship between principals' transformational *leadership and school effectiveness.*

The results of this study show that principals' transformational leadership style positively impacts school effectiveness, and teachers' organizational citizenship behavior plays a mediating role in this relationship. These findings have significant implications from both practical and theoretical perspectives.

First, the positive impact of principals' transformational leadership style on school effectiveness can be explained at two levels. On the one hand, transformational leaders can stimulate teachers' intrinsic motivation, making them more engaged in their work, thus improving teaching quality and student learning outcomes (Bass & Avolio, 1994; Leithwood & Jantzi, 2006). On the other hand, transformational leaders usually have an innovative spirit and vision. They can create an organizational atmosphere conducive to reform and innovation, thus promoting continuous school improvement and development (Burns, 1978; Leithwood & Jantzi, 2006). In addition, the mediating role of teachers' organizational citizenship behavior in the relationship between principals' transformational leadership style and school effectiveness can be understood from several aspects. Firstly, transformational leaders shape a supportive work environment and build trust relationships, encouraging teachers to participate voluntarily in various school activities and affairs (Podsakoff et al., 1990). Such behavior helps improve cooperation and communication among teachers, promoting the sharing of teaching methods and strategies and further improving school effectiveness.

Secondly, teachers' organizational citizenship behavior can reduce management costs and resource waste (Organ, 1988). When teachers take on additional roles and responsibilities voluntarily, principals and management teams can focus more on formulating strategies and promoting school reforms, thus enhancing the overall operational capacity of the school. Finally, from a theoretical perspective, the results of this study provide a new explanatory framework for the relationship between transformational

leadership and school effectiveness, i.e., the mediating role of teachers' organizational citizenship behavior. This finding contributes to a more comprehensive understanding of the influence mechanism of transformational leadership on school effectiveness and provides new insights and directions for future research. Furthermore, this result also has important implications for educational practice. School administrators should attach importance to the principal's transformational leadership style and actively cultivate and utilize teachers' organizational citizenship behavior to improve the school's overall effectiveness.

From a theoretical perspective, the results of this study support Bass's (1985) transformational leadership theory, which suggests that transformational leaders can inspire the potential of their subordinates, thereby improving organizational performance. In addition, this study also supports Organ's (1988) proposition of the impact of organizational citizenship behavior on organizational performance, indicating that teachers' organizational citizenship behavior plays a crucial role in the relationship between a principal's transformational leadership and school effectiveness. From a practical perspective, the results of this study imply that school administrators should strive to enhance their transformational leadership abilities, such as establishing a vision, inspiring employee potential, and meeting employee needs (Bass, 1985; Northouse, 2013). Meanwhile, administrators should create a supportive organizational environment that allows teachers to feel respected and trusted in their work, stimulating their organizational citizenship behavior (Organ, 1988; Podsakoff et al., 1990).

In conclusion, the results of this study demonstrate that principals' transformational leadership style positively impacts school effectiveness, with teachers' organizational citizenship behavior mediating in this relationship. These findings provide valuable insights for school administrators from both practical and theoretical perspectives, emphasizing the importance of transformational leadership strategies and teachers' organizational citizenship behavior in improving school effectiveness. Future research can further explore other potential mediating and moderating variables to enrich and deepen the understanding of this relationship.

Addressing the **Limitations** *of the Study*

This study employed meta-analysis and structural equation modeling to investigate the relationship among principals' transformational leadership, teachers' organizational citizenship behavior, and school effectiveness. However, such research methods have certain limitations, which will be discussed below: Firstly, this study mainly used questionnaires for quantitative research, which may not fully cover all factors affecting principals' transformational leadership, teachers' organizational citizenship behavior, and school effectiveness (Creswell, 2014). Future research could combine qualitative research methods, such as in-depth interviews or case studies, to obtain richer data and a deeper understanding of relevant concepts (Maxwell, 2012). Secondly, this study's focus was primarily on principals' leadership behavior at the primary and secondary school levels, without covering kindergartens. Future research could expand to different educational stages to explore whether the relationship between transformational leadership, organizational citizenship behavior, and school effectiveness is universal (Leithwood et al., 2008).

In addition, this study adopted meta-analysis and structural equation modeling, which may have certain model assumption limitations (Borenstein et al., 2009; Kline, 2015). Future research could use other statistical methods, such as random-effects models or multilevel modeling, to verify the robustness of the research results (Hox et al., 2017). Lastly, as the scope of this study was limited to published literature, there may be publication bias (Rothstein et al., 2005). Future research could consider using unpublished data to obtain more comprehensive results (Greenland, 1987).

5. Conclusions and Suggestions

5.1. Exploring Multiple Connections between Transformational Leadership and Teachers' Organizational Citizenship Behavior

In today's society, education is one of the essential social resources. In this context, school management

and leadership play a crucial role. As the leaders of schools, principals not only need to manage various aspects of the school and inspire teachers' active participation and organizational citizenship behavior to improve school effectiveness and education quality.

The findings of this study indicate that transformational leadership has a positive and significant impact on teachers' organizational citizenship behavior, which is consistent with the conclusions of previous studies. However, when exploring the impact effects of leadership on teacher behavior, we need to consider the influence of other factors. For example, leadership behavior may be affected by cultural differences and differences in education systems. According to Hofstede's (1984) cultural dimensions theory, different cultural values influence people's perceptions and expectations of leadership behavior, affecting their behavior. Under other education systems, the focus of school management and leadership may vary, leading to different leadership behavior effects under different education systems.

Moreover, teachers' feelings and experiences during the leadership process must be considered. Teachers' reactions to leadership behavior are complex and influenced by their characteristics and backgrounds. Understanding teachers' responses to leadership behavior can help us better understand the impact of leadership on teacher behavior.

In summary, the conclusions of this study remind us that we need to consider the impact of leadership behavior from multiple perspectives. By exploring aspects such as cultural differences, differences in education systems, and teachers' feelings and experiences, we can gain a deeper understanding of the impact of leadership on teacher behavior. In future research, we must continue exploring these factors and apply the results to practice to improve school effectiveness and education quality.

5.2. Toward Change: The Potential and Advantages of Organizational Citizenship Behavior in the Field of Education

Through reviewing and analyzing numerous academic perspectives, concludes that teachers' organizational citizenship behavior positively impacts school effectiveness. Organizational citizenship behavior promotes the continuous improvement and development of schools and helps improve the quality of education. Therefore, educators and researchers should pay more attention to the potential and value of organizational citizenship behavior in education.

Future research can explore the impact of organizational citizenship behavior on school effectiveness from various aspects, aiming to contribute to improving school effectiveness and education quality at both academic and practical levels. In addition, researchers should also focus on the relationship between teachers' organizational citizenship behavior and other related variables, such as teacher satisfaction, student academic achievement, parent involvement, and school atmosphere, to gain a comprehensive understanding of the role of organizational citizenship behavior in the field of education. Exploring the applicability and effects of organizational citizenship behavior in different cultural and educational environments will contribute to developing more targeted and effective educational strategies and training programs. At the same time, educational administrators can enhance teachers' work enthusiasm and satisfaction by training and motivating teachers to participate in organizational citizenship behavior, thereby promoting the improvement of school effectiveness.

Finally, educators and scholars should deeply explore and utilize the potential advantages of organizational citizenship behavior to drive innovation and change in the field of education. Through systematic research and practice, the field of education can better understand and tap into the potential of organizational citizenship behavior, making significant contributions to improving school effectiveness, enhancing education quality, and cultivating more outstanding talents.

5.3. Innovative Perspective: The Key Role of Transformational Leadership in Enhancing School Effectiveness

The results of this study reveal a significant relationship between the transformational leadership of school principals and school effectiveness, which has important implications and contributions to the education field. Firstly, in terms of educational practice, school managers and policymakers should

focus on cultivating and developing the transformational leadership ability of school principals. School principals should pay attention to the needs of teachers and students in daily management, stimulate their potential, establish a shared vision, and promote innovation to improve school effectiveness. In addition, principals should actively participate in educational practices to better understand and respond to the challenges faced in the education process.

Secondly, in terms of policy-making, the education sector and schools should develop related training programs to improve the transformational leadership ability of school principals. At the same time, policymakers should pay attention to the impact of education policies and systems on the implementation of transformational leadership in order to provide more targeted recommendations and guidance for practice. In addition, the results of this study also provide new directions for future research. Finally, researchers can further explore the relationship between transformational leadership and other relevant variables, such as teacher satisfaction and student participation, to gain a more comprehensive understanding of the impact of transformational leadership in education. Furthermore, researchers can also pay attention to the impact of education policies and systems on implementing transformational leadership to provide more targeted recommendations and guidance for practice.

In conclusion, the results of this study have important implications and contributions to the education field. By cultivating and developing the transformational leadership ability of school principals, we can promote the improvement of school effectiveness and the quality of education and student learning outcomes.

5.4. Teacher Organizational Citizenship Behavior: A Key Element in Leading School Effectiveness

School effectiveness has always been an essential issue in the field of education. The results of this study show that teacher organizational citizenship behavior plays a crucial role in improving school effectiveness. Specifically, in the relationship between the principal's transformational leadership style and school effectiveness, teacher organizational citizenship behavior acts as a mediator, providing valuable insights for enhancing school effectiveness.

The critical role of teacher organizational citizenship behavior in school effectiveness has significant practical and theoretical implications. From a practical perspective, the results of this study emphasize the need for school administrators to focus on developing the principal's transformational leadership style and actively promoting teacher organizational citizenship behavior. Additionally, school administrators should provide supportive work environments and trusting relationships to stimulate teacher initiative and creativity, further improving school effectiveness. From a theoretical perspective, the results of this study enrich our understanding of the impact of transformational leadership theory and organizational citizenship behavior on organizational performance, providing new ideas and directions for future research. Furthermore, the results of this study also provide a new explanatory framework for the relationship between transformational leadership and school effectiveness, namely the mediating role of teacher organizational citizenship behavior, which helps us to comprehensively understand the mechanism of the impact of transformational leadership on school effectiveness.

In summary, teacher organizational citizenship behavior's critical role in school effectiveness has important practical and theoretical implications, emphasizing the need for school administrators to value and actively promote teacher organizational citizenship behavior to enhance school effectiveness. Future research can explore other possible mediator and moderator variables to enrich and deepen our understanding of this relationship.

5.5. New Perspectives for Future Research Recommendations

Future research may incorporate qualitative research methods into the study, such as in-depth interviews, focus groups, or case studies, to more comprehensively understand the relationship between principals' transformational leadership, teachers' organizational citizenship behavior, and school effectiveness. Consider conducting similar research in different educational stages, regions, and cultural backgrounds

to verify the applicability of research results in various situations. In terms of research methods, future research may try using other statistical methods, such as random-effects models, multilevel modeling, or network analysis, to validate and expand the results of this study. To address issues of reliability and validity of scales and questionnaires, future research may explore the use of alternative scales or questionnaires, as well as methods to improve existing scales and questionnaires, to enhance the reliability and validity of research results. Further investigation into the underlying mechanisms and moderating variables between principals' transformational leadership, teachers' organizational citizenship behavior, and school effectiveness may be conducted to gain a deeper understanding of the interaction between these variables.

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