The relationship between principal inclusive leadership, teacher efficacy and teachers' innovative behavior

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Article Info

ABSTRACT

The objective of this study was to explore the relationship among principals' inclusive leadership, teachers' sense of efficacy, and teachers' innovative behaviors. A sample of 671 middle school teachers from Guangxi, China was utilized. The study revealed that the practice of inclusive leadership by principals had a positive effect on teacher efficacy. Furthermore, teacher efficacy appeared to have a beneficial effect on teacher innovative behavior. Additionally, the study showed that principal inclusive leadership significantly influenced teacher innovative behavior. Lastly, it proved that teacher efficacy played a mediating role in the relationship between principal inclusive leadership and teacher innovative behavior. The study offers strategies for enhancing teacher's propensity for innovative conduct. When designing programs to promote teacher innovative behavior, it is important to take into account the impact of inclusive leadership by principals and the magnitude of teacher efficacy.

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1. INTRODUCTION

In the age of the digital society, innovation has emerged as a crucial determinant for individuals, businesses, and nations to maintain their relevance. Nevertheless, invention does not occur spontaneously. An organization's ability to innovate depends on its individuals and requires a constant change in their consciousness, ambitions, and mindsets [1]. Innovative behaviors refer to individual activities and behaviors that are specifically aimed at creating, developing, or implementing anything new, such as a product, technology, or service. These behaviors can also involve making changes to procedures or work processes in order to enhance the efficiency and effectiveness of an organization [1]. Teachers' innovative behavior stands at the heart of innovation within educational institutions [2]. Moreover, the cultivation of students' creative abilities is closely intertwined with the innovative behavior of teachers. China has continually prioritized improving the inventive capacities of its teachers as part of its ongoing efforts to improve curricular and instructional reforms. In 2020 China's Ministry of Education issued "China's Education Modernisation 2035", a document that sets out a vision to significantly improve teachers' proficiency, expertise and innovation by 2035.

Teacher efficacy and leadership are two crucial determinants that impact the innovative behaviors exhibited by educators [3]. Amidst China's swift progress and expanding societal inclusiveness, instructors are encountering a surge in diversity and individualization. Meanwhile, China still largely adheres to a collectivist societal model, which extends into its educational system. Schools often prioritize obedience,

which can limit teachers' autonomy and boundaries in their behavior. Additionally, Chinese organizational settings tend to place a significant emphasis on the emotional aspects of interpersonal relationship [4]. Some studies on Chinese principalship have revealed that Chinese principals often do not engage in direct interactions with individual teachers. Instead, they prefer to exert influence indirectly by restructuring school systems and nurturing positive relationships [5]. In recent decades, school leadership research has predominantly focused on established leadership styles like transformational leadership, as well as emerging styles such as distributed leadership and instructional leadership, but none of these leadership styles directly address the complexity and diversity within teacher communities.

The concept of inclusive leadership was coined by Nembhard and Edmondson [6]. They believe that inclusive leadership is the leader's behavior that invites and appreciates the opinions of others, thus helping to shape team members' beliefs that their voices are genuinely valued. Thus, inclusive leadership focuses on whether subordinates find the leader helpful and whether the leader listens and pays attention to subordinates' needs. These characteristics set inclusive leadership apart from other leadership styles. The distinctive attributes of inclusive leadership make it particularly suitable for managing diverse organizational members, harnessing the creative potential of a diverse workforce, and mitigating the negative consequences of diversity, such as relational conflicts and communication challenges [7]. Given the diversity, obedience, and relationship organizational culture prevalent in the Chinese education context, inclusive leadership emerges as a potentially effective leadership style. It may be having the capacity to address these unique challenges, break down barriers to innovation, and inspire innovative behaviors among teachers.

Teacher efficacy as the teacher's belief in his/her capacity to organize and execute the course of action required to complete a specific teaching task in a particular context [8]. Her study measured teacher efficacy through three dimensions: classroom management, instructional strategies, and student engagement. Teacher self-efficacy is a fundamental characteristic of teachers and is closely related to their teaching behaviors [9]. Rooted in self-efficacy theory, self-efficacy governs motivation and behavior, acting as a crucial link between environment and individual actions [10]. However, no research has been conducted that explores the impact of principals' inclusive leadership on teachers' innovative behaviors and the role of teacher efficacy in their relationships.

Therefore, this study will use a quantitative approach with a sample of middle school (K7–K9) teachers in Guangxi, China. It aims to explore the correlation between principal inclusive leadership, teacher efficacy, and teacher innovative behavior. In particular, the mediating role of teacher efficacy between principal inclusive leadership and teacher innovative behavior. To find effective ways to free teachers' creative behaviors, encourage change and innovation in education, and eventually help students grow.

Social cognitive theory posits that environmental factors, behavior, and individual human factors are distinct theoretical entities that are both independent and interdependent, mutually influencing and determining one another [11]. In this study, inclusive leadership of principals falls under the category of environmental factors, teachers' sense of efficacy is classified as a personal cognitive factor, and teachers' innovative behavior is considered a behavioral factor. Thus, with the support of social cognitive theory, the three variables in this study may have the following relationships.

Firstly, innovative activity frequently defies existing norms and entails significant risks and uncertainty [12]. Teachers require a feeling of assurance and drive in order to actively participate in innovative conduct. Inclusive leaders have a high level of tolerance towards mistakes, offer support and direction to their workers when they make errors, and cultivate a secure working atmosphere that encourages staff engagement in innovative work [13]. Furthermore, autonomy is a necessary condition for innovative behavior, and inclusive leadership fosters employee engagement in decision-making processes [14], while also providing support for the generation of original ideas [15]. Therefore, inclusive leadership grants teachers the independence required to conceive, promote, and execute novel concepts. Furthermore, diversity fosters innovation [16]. Inclusive leadership encompasses a leadership style that places importance on diversity, actively listens to the perspectives of followers, shows respect for differences, promotes a sense of belonging among team members, and acknowledges and appreciates their individuality [13]. Thus, we propose hypothesis 1: principal inclusive leadership has a positive influence on teachers' innovative behavior.

Inclusive leaders play a pivotal role in enhancing teacher efficacy through several mechanisms. Firstly, they offer guidance, professional advice, and unwavering support to teachers, thereby contributing to teacher achievement. This accumulation of achievement experiences serves to bolster teacher efficacy. Secondly, inclusive leaders serve as influential role models. They actively engage in discussions about organizational goals, taking the initiative to work towards their attainment, and teachers learn from these behaviors. Additionally, principals share their experiences and provide guidance, enabling teachers to gain indirect experience, which positively influences their sense of efficacy [17]. Simultaneously, equitable treatment of all teachers by the principal cultivates a setting in which teachers, upon witnessing enhanced performance among their colleagues under the principal's leadership and receiving acknowledgment, develop confidence in their capacity to increase their effectiveness via committed endeavors. Thirdly, leaders with an

inclusive style communicate openly with teachers, recognize their contributions, and offer both verbal and tangible encouragement. This approach boosts teachers' confidence in completing their tasks [6]. Lastly, inclusive leaders break away from traditional hierarchical structures by treating teachers as equals, fostering close relationships through positive communication and assistance. This approach generates positive emotions among teachers, nurturing a sense of belonging and maintaining positive psychological energy within the team [13]. Consequently, we propose the following hypothesis 2: principal inclusive leadership has a positive influence on teacher efficacy.

Self-efficacy profoundly influences individual behavior and one's ability to navigate challenges [18]. This inner belief strengthens the capacity to persistently experiment with innovative actions despite uncertainties. Bandura and Locke [19] highlighted that high self-efficacy correlates with increased motivation, sustained effort, emotional stability, and stress resilience. Consequently, those with heightened self-efficacy are more inclined to pursue challenging endeavors, including innovation [20]. Such individuals are adept at pinpointing issues within innovative behaviors and devising novel solutions [21], thereby effectively addressing the intricacies of implementing fresh ideas.

Moreover, teachers with high levels of efficacy have high self-confidence. They are more likely to respond positively to unknown problems and difficulties, reducing innovation risks. They are also more tolerant of failed attempts at innovation, which is essential for innovation [22]. According to Bandura [23], high self-efficacy ratings are commensurate with overcoming domain barriers. In contrast, those with low self-efficacy exhibit conformism and find it difficult to feel confident in overcoming difficulties or achieving innovative results. In schools, teacher efficacy is an important motivational factor influencing innovative teaching and learning [24]. Based on these observations, we put forward the following hypothesis 3: teacher efficacy has a positive influence on teachers' innovative behavior.

Self-efficacy plays a central role in shaping individual behavioral choices and serves as a vital link between external environmental influences and individual decision-making [18]. The sense of efficacy is instrumental in elucidating how teachers' perceptions of their work environment impact their behaviors and activities, serving as a predictor of teacher behavior [22]. Moreover, self-efficacy can act as a mediator between specific leadership behaviors and factors associated with employee innovation [25]. Leadership, particularly the principal's conduct, significantly influences teachers' perceptions and behaviors [26]. Simultaneously, an individual's perception of their ability to perform a task positively correlates with their performance, including creative output, as seen in creativity research [27]. Building upon these premises and the previous hypotheses, we propose hypothesis 4: teacher efficacy mediates the relationship between principal inclusive leadership and teachers' innovative behavior. We created a model illustrating the connection between principal inclusive leadership, teacher efficacy, and teacher innovative behavior based on the theories and assumptions mentioned. This model is depicted in Figure 1.
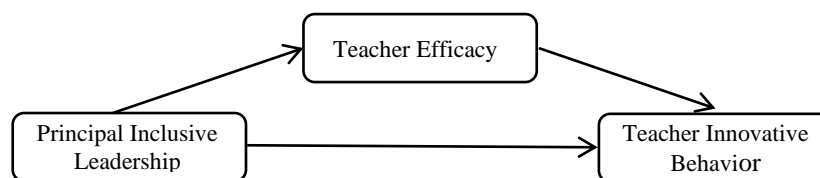

Figure 1. Hypothesized research model

2. METHOD

This study investigated teachers employed in public junior high schools in Guangxi, China. Guangxi is a provincial administrative territory in Mainland China and has been listed as one of China's five ethnic minority autonomous regions. Guangxi had a total of 2,024 public junior high schools in 2021, with a teaching staff consisting of 172,131 teachers. Out of the total number of teachers, 97,736 (56.78%) were female, while 74,395 (43.22%) were male.

For the study, proportional stratified sampling was employed. Applying the Cochran method [28], with a confidence interval (CI) of 0.99 and a margin of error of 0.05, the minimum required sample size for this study was determined to be 664. There are 12 cities in Guangxi. A total of 864 questionnaires were distributed across 200 public junior high schools in 12 cities. Ultimately, 858 questionnaires were returned, resulting in a return rate of 99.31%. After eliminating invalid and abnormal responses, 671 valid questionnaires remained, corresponding to an effective rate of 78.21%. Consequently, valid questionnaires surpass the required minimum sample size.

Demographic characteristics of the sample are as: regarding gender, 24% of respondents are male, while 76% are female. In terms of ethnicity, 56.3% belong to the Han ethnicity, while 43.7% are from ethnic minorities. Age-wise, 62.6% are under 40 years old, 26.7% are aged between 40 and 49, and 10.7% are 50 years old or older. In terms of education, 96% hold a bachelor's degree or higher. About 51.6% have 10 years of teaching experience or less, while 48.5% have more than 10 years of teaching experience.

All variables were measured on a five-point Likert scale, with higher scores representing higher levels. Principal's inclusive leadership was gauged using a 9 items scale [13], with a Cronbach's alpha of 0.94. In our study, the scale exhibited a Cronbach's alpha of 0.976. Teacher efficacy was assessed using Tschannen-Moran and Hoy's 24 items scale [8], encompassing three dimensions: teaching strategy efficacy (8 items; Cronbach's α=0.91), classroom management efficacy (8 items; Cronbach's α=0.90), and student engagement efficacy (8 items; Cronbach's α=0.87). In the current study, Cronbach's alpha values for these dimensions were 0.911, 0.920, and 0.919, respectively. The teachers' innovation behavior scale in this study, comprising 20 items, was adapted by Zainal and Matore [1]. This measure includes four dimensions: exploring opportunities (5 items), generating ideas (5 items), promoting ideas (5 items), and realizing ideas (5 items), with initial Cronbach alpha values between 0.788 and 0.856. For this study, the respective Cronbach alpha values for these dimensions were 0.833, 0.890, 0.923, and 0.908.

This study employed SPSS 27.0.1.0 and AMOS 23.0.0 for data management and analysis. The analytical process included: the covariance base SEM technique was utilized to examine the hypotheses. Test the measurement model first before discussing the path analysis among latent variables (factors/structures). Confirmatory factor analysis was used to evaluate the measurement models and test the unidimensionality, validity, and reliability of an unobserved latent construct (factor) [29]. Once the model fit is complete, the path model between potential variables will be evaluated. For the mediation analysis, we used bootstrap tests.

Confirmatory factor analysis was performed to assess the measurement models for principal inclusive leadership, teacher efficacy, and teachers' innovative behavior. After modifying the measurement model, a satisfactory model was achieved with the following model fit indices: X2/df=2.789, TLI=0.946, CFI=0.950, SRMR=0.06, and RMSEA=0.052. The model's validity and reliability results are presented in Table 1. All factor loadings above 0.6. The composite reliability (CR) values are 0.815, 0.913, and 0.797, all of which above the threshold of 0.7, indicating strong reliability. Similarly, the average variance extracted (AVE) values are 0.815, 0.913, and 0.797, all of which meet the minimum requirement of 0.5, demonstrating satisfactory convergent validity. Moreover, the square root of the factor AVE surpasses the correlation coefficient of the factor with other factors, which suggests that there is satisfactory discriminant validity. Therefore, the measurement model is considered appropriate for examining the succeeding structural model.

Given that all variables were collected from the same source simultaneously, there was a potential concern regarding common method variance (CMV). To assess its influence, we conducted Harman's One-factor test. The fit indices for the single-factor model (X2/df=17.360; TLI=0.505, CFI=0.535, SRMR=0.139, RMSEA=0.156) were notably lower, indicating a worse fit compared to the three-factor model. Consequently, CMV does not appear to be a significant concern affecting our results.

Table 1. Reliability and validity analyses of the full measurement model

	Item	Estimate	AVE	CR	1	2	3
1. Principal inclusive leadership	6	0.859-0.933	0.815	0.963	0.903		
2. Teacher efficacy	13	0.679-0.855	0.913	0.969	0.426***	0.955	
3. Teachers' innovative behavior	16	0.613-0.884	0.797	0.94	0.379***	0.613***	0.893

Note: Diagonals represent the square root of the average variance extracted, while the other entries represent the squared correlation coefficients. n=671 teachers.

3.   RESULTS AND DISCUSSION
3.1. Descriptive statistics and correlation analyses

Descriptive statistics and correlation analyses were performed. The mean scores were 3.837 for principal inclusive leadership (SD=0.912), 3.973 for teacher efficacy (SD=0.567), and 3.497 for teacher innovative behavior (SD=0.598). Positive correlations were found between principal inclusive leadership and teacher innovative behavior (r=0.360, p<0.01), and teacher efficacy (r=0.416, p<0.01). Moreover, a positive relationship existed between teacher efficacy and innovative behavior (r=0.590, p<0.01), aligning with the proposed hypotheses.

3.2. Structural model

In the following, we construct a structural equation model for path analysis. The model exhibited an acceptable fit with the following indices: X2/df=2.789, TLI=0.946, CFI=0.950, SRMR=0.060, and RMSEA=0.052. Referring to the Amos output, a standardized total effect of 0.379 (p < 0.01), allows for

further analysis. Table 2 presents the path analysis results: principal inclusive leadership demonstrated a positive relation to teachers' innovative behavior (β=0.544, p<0.001), thereby supporting hypothesis 1. Principal inclusive leadership was positively associated with teacher efficacy (β=0.419, p<0.001), thus confirming hypothesis 2. Teacher efficacy was positively associated with teachers' innovative behavior (β=0.151, p<0.001), substantiating hypothesis 3.

Table 2. Path testing of structural models

Path	Unstd.	Std.	S.E.	C.R.	P
Principal inclusive leadership → teacher efficacy	0.232	0.419	0.024	9.663	***
Teacher efficacy → teachers' innovative behavior	0.115	0.151	0.029	3.975	***
Principal inclusive leadership → teachers' innovative behavior	0.748	0.544	0.068	11.055	***

Note: *p<0.05,**p<0.01,***p<0.001.n=671 teachers.

3.3. The mediating analysis

To examine the mediating role of teacher efficacy in the link between principal's inclusive leadership and teachers' innovative behavior, we utilized a bootstrapping method with 5,000 samples. Table 3 details the results. The findings indicate that the principal's inclusive leadership significantly and positively influences teachers' innovative behavior indirectly through enhanced teacher efficacy (indirect effect=0.228, 95% CI=[0.179, 0.286], SE=0.027, p<0.001). The ratio of indirect effects to total effects is 60.16%. Additionally, the direct impact of principal's inclusive leadership on teachers' innovative behavior was also significant (direct effect=0.151, 95% CI=[0.069, 0.241], SE=0.044, p<0.001). Hence, teacher efficacy acts as a partial mediator in the relationship between principal's inclusive leadership and teachers' innovative behavior, affirming the validity of the mediating model.

Table 3. Bootstrapping results for the standardized direct, indirect, and total effects of variables

Construct	Point estimation	SE	Bias-corrected 95%CI			Percentile 95%CI		
			Lower	Upper	P	Lower	Upper	P
Principal inclusive leadership → teacher efficacy → teachers' innovative behavior								
Indirect effect	0.228	0.027	0.179	0.286	0	0.177	0.283	0
Direct effect	0.151	0.044	0.069	0.241	0	0.065	0.237	0
Total effect	0.379	0.046	0.286	0.464	0	0.286	0.465	0

3.4. Discussion

All the proposed hypotheses in this investigation were confirmed. Principals who practice inclusive leadership have a positive impact on the innovative behavior of teachers. The principal's effective inclusive leadership positively influences teacher efficacy. Teacher efficacy has a beneficial impact on the extent to which teachers engage in innovative activity. Teacher efficacy serves as an intermediary in the relationship between principal inclusive leadership and teacher innovative behavior.

This study provides further evidence supporting the beneficial impact of principals' inclusive leadership on teachers' innovative actions. Principals who practice inclusive leadership value staff input, prioritizing communication with teachers and aiding in problem-solving. This approach fosters strong relationships and enhances teachers' psychological security [30], thereby encouraging them to challenge organizational norms and embrace innovation. The findings of this investigation align with the outcomes of comparable investigations conducted in different nations [31], [32]. The study's sample consists of teachers in China, indicating that the correlation between inclusive leadership of principals and teachers' innovative actions remains consistent across various nations and locations.

Furthermore, the practice of inclusive leadership by principals is positively correlated with teacher efficacy. Inclusive leadership entails principals actively engaging in communication, encouraging teacher participation in decision-making, and assisting with problem-solving. This open communication channel ensures that teachers feel comfortable approaching principals with issues, thereby strengthening the principal-teacher relationship and boosting teachers' confidence in their abilities [33]. Principals' inclusive leadership, characterized by its supportive nature, enhances teachers' self-assurance in their professional capacities. Previous studies [34], [35] noted that employees' self-efficacy perceptions improve under managers who display inclusive behaviors. Our study yielded similar findings for the first time within an educational organizational setting.

Additionally, the study further affirms that teacher efficacy significantly influences teachers' innovative behavior. Teachers with higher self-efficacy levels feel more confident in their skills and

knowledge [36], making them bolder in undertaking challenging endeavors like innovative behaviors [37]. High-efficacy teachers are typically more open to new ideas and eager to experiment, fostering their engagement in innovative activities [38], this was in line with previous studies [1], [21].

Crucially, the study demonstrates that teacher efficacy is a factor in linking principals' inclusive leadership with teachers' innovative behavior, serving as a partial mediator. Inclusive leaders not only provide positive support and resources but also set and encourage higher goal attainment, and discuss strategies to achieve these goals with teachers. This approach enhances teacher efficacy, which in turn, spurs innovative behaviors. This finding is also consistent with research on business organizations [39]. It is also the first study to argue that teacher efficacy mediates the relationship between principal inclusive leadership and teacher innovative behavior. This discovery fills a gap in past research.

This study holds significant theoretical consequences. The integrative model demonstrates the direct effects of inclusive leadership by principals on teachers' innovative actions, while also highlighting the indirect effect of teacher efficacy as a mediator. This outcome aligns with Bandura's social cognitive theory and reinforces the principles of social cognitive theory, which posits that the environment, self-efficacy, and conduct are interconnected, and that the environment exerts its influence on behavior through self-efficacy. Furthermore, the model aligns with findings from studies conducted in non-educational organizations, which have demonstrated that inclusive leadership has both direct and indirect positive impacts on subordinates' innovative behaviors. This suggests that the model is robust and reliable.

The findings of this study carry substantial practical ramifications for educational institutions in China. It provides new perspectives on methods to improve teacher innovation. Teachers, being a highly educated and trained workforce, should not be limited to fixed responsibilities inside schools. In the Chinese educational context, the voices of teachers are frequently ignored. This circumstance might dampen instructors' excitement for producing, exploring, sharing, and implementing new ideas. Therefore, the efficient deployment of human resources through suitable leadership within educational organizations becomes a crucial matter.

Thus, it is crucial to prioritize the influence of inclusive leadership and teacher efficacy when designing initiatives to promote innovative teacher conduct. On one hand, educational institutions should establish a systematically diverse and inclusive environment. Inclusion-focused components should be integrated into principal training programs, alongside enhanced communication and interpersonal skills content, encouraging more inclusive management practices. On the other hand, educational administrators should concentrate on enhancing teacher efficacy. Several strategies can be employed to bolster teacher efficacy: Establish a comprehensive and systematic teacher training system, offering diverse training opportunities through methods like in-service training, online courses, and job shadowing. Develop a professional growth incentive system that allows teachers to showcase their expertise, gain more successful teaching experiences, and enhance their professional competence and confidence.

4. CONCLUSION

The study examined the relationship between the inclusive leadership of principals, teacher efficacy, and teacher innovative behaviors in Chinese junior high schools. The findings indicated a positive correlation between the principal's inclusive leadership and both teacher efficacy and teacher innovative behavior. Furthermore, it was discovered that teacher efficacy is positively correlated with teacher innovative behavior. Additionally, it was discovered that teacher efficacy served as a partial mediator in the connection between principals' inclusive leadership and teachers' innovative conduct.

This work has profound ramifications both in terms of theoretical understanding and practical implementation. The study developed a model that explains the relationship between inclusive leadership, teacher efficacy, and teacher innovative behavior. This study checks the specific ways in which inclusive leadership by principals and teacher efficacy influence the innovative behavior of teachers. The research model is consistent with the findings derived from prior studies. Moreover, it reinforces the social cognitive theories. Concurrently, the results of this study provide school administrators with opportunities to improve teacher innovative behaviors. More precisely, they can accomplish this by advocating for inclusive leadership principles and strengthening teacher effectiveness.

Nevertheless, it is unavoidable to come across the constraints of the study over the course of doing the research. The findings of this study are limited due to its exclusive dependence on teachers' self-reports, without taking into account the viewpoints of principals. Future study should improve the validity of findings by using diverse data sources, such as the perspective of principals, external evaluations, and measurable indications of innovation, such as published articles.

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