The Influence of Principal Inclusive Leadership and Teacher Efficacy on Teachers' Innovative Behaviour

Mo Dongxiao, [1]Suhaida Abdul Kadir, Enio Kang Mohd Sufian Kang, Roshafiza Hassan

Faculty of Educational Studies, Universiti Putra Malaysia (UPM), 43400 Serdang, Selangor, Malaysia
Email: gs56762@student.upm.edu.my
[1]Corresponding Author Email: suhaida@upm.edu.my

Abstract

China's education system must continue to innovate in order to keep pace with the development of information technology and globalization, and teacher innovation is a prerequisite for innovation in the education system. Therefore, it is necessary to understand the factors that influence teachers' innovative behavior. This study aims to explore the influence of principal inclusive leadership and teacher efficacy on teachers' innovative behaviors in China's junior high school. We sampled 671 teachers in junior high schools in Guangxi, China.The study found that teachers' perceptions of principal inclusive leadership and teacher efficacy were at high levels and teacher innovative behavior was at medium levels. Principal inclusive leadership dimensions were moderately and positively correlated with teacher innovative behavior. Teacher efficacy dimensions were strongly and positively related to teacher innovative behavior. Both principal inclusive leadership and teacher efficacy had a significant effect on teachers' innovative behavior, accounting for 40.6% of the variance in teachers' innovative behavior. The results of the study indicate that teachers' innovative behavior is not sufficient. Both principal inclusive leadership and teacher efficacy had an impact on teachers' innovative behavior. Therefore, stakeholders should consider principal inclusive leadership and teacher efficacy factors when drafting and implementing policies and programs to improve teachers' innovative behavior.

Keywords: Principal Inclusive Leadership, Teacher Efficacy, Teachers' Innovative Behavior, Junior High School, Educational organization.

Introduction

With the development of the information society, the global economy and all areas of society are constantly and rapidly changing. In a rapidly changing and open environment, innovation is an inexhaustible engine for the development of organizations, societies and nations. Organizational innovation depends on human behavior, and innovative employee behavior is critical to organizational success and survival(Thurlings et al., 2015). Innovative behaviors are individual behaviors and actions that are designed to create, develop

or apply something new, such as a product, technology, service, or to change procedures or work processes to improve existing work to increase the efficiency and effectiveness of an organization(Messmann & Mulder, 2012; West & Farr, 1989; Zainal & Matore, 2021).

The education system is responsible for nurturing innovative talents, and it needs to remain innovative in order to keep up with the development of society. In the field of education, the innovative behaviors that should be prioritized and focused on are those of teachers, as teachers are not only the largest unit in this field, but also the main driver of the education system, and the creation of innovations in the field of education depends on the innovative behaviors of teachers(Hasanefendic et al., 2017; Koeslag-Kreunen et al., 2018; Lambriex-Schmitz et al., 2020).Teachers' innovative behavior includes various behavioral activities aimed at creating innovation, including exploring opportunities, generating ideas, promoting ideas, and realizing ideas (Zainal & Matore, 2019).Meanwhile, the dimensions of teacher innovation behaviors do not occur in a sequential manner and are discontinuous activities, individuals can engage in any mixture of these behaviors at any given time(Gkontelos et al., 2022).

China also attaches great importance to teacher innovation. "Reform" and "innovation" are high-frequency words in China's education policy documents. 2019 China Education Modernization 2035, issued by the CPC Central Committee and the State Council, proposes to "build a high-quality, specialized and innovative teaching forc(Central People's Government of the People's Republic of China, 2019). In 2022, the Ministry of Education and other eight departments issued the "New Era Basic Education Strong Teachers Plan", which proposes that "efforts should be made to create a high-quality, specialized and innovative primary and secondary school teacher team in the new era"(Ministry of Education of the People's Republic of China, 2022).Therefore, What is the level of innovative behavior of Chinese teachers?How to stimulate teachers' innovative behavior? Will be an important question for schools to crack.

There are numerous factors that influence innovative behavior, including demographics, individuals or personalities, and organizations(Scott & Bruce, 1994). A systematic review by Zainal and Matore (2019),summarizes 46 factors that scholars have studied that influence teacher innovative behavior, including demographics, individuals, or organizations. It is difficult to identify the most valuable and influential factors in this study.however, this study only selected the factors of principal inclusive leadership and teacher efficacy, meticulously based on several considerations such as the organizational context of education in China,literature review, theories, and related empirical evidence.

Inclusive leadership is a type of relational leadership, with its respect for follower diversity and personality traits, its focus on whether followers perceive the leader to be helpful to them, and whether the leader listens and pays attention to the needs of followers(Carmeli et al., 2010).Inclusive leaders demonstrate openness, accessibility, and availability in their interactions with their followers(Carmeli et al., 2010; Nembhard & Edmondson, 2006). Openness refers to the leader's ability to involve subordinates in decision-making and to ensure that information is freely exchanged between the leader and subordinates. Availability means that the leader is able to provide professional guidance and assistance to subordinates. Accessibility implies a strong connection between the leader and subordinates(Carmeli et al., 2010).These characteristics also distinguish inclusive leadership from other leadership styles. It also signals that it better suited to lead diverse members, to stimulate the creative potential of diverse members, and to reduce the negative effects of diversity in relational conflict and communication.(Mendelsohn, 2021).

As China develops and opens up more, teachers are becoming more diverse and individualized.Especially the younger generation, They have outstanding personalities. Meanwhile, China remains a social paradigm that tends to emphasize collectivism, with a greater emphasis on obedience and harmony in public organizations, where the boundaries and autonomy of teachers' behavior are limited. In addition, the emotional underpinnings associated with interpersonal relationships are more prominent in Chinese organizational environments(Wasti et al., 2011). Even in school, Chinese principals prefer to influence teachers indirectly by building good relationships, rather than interacting with them directly(Haiyan et al., 2017; Liu et al., 2016; Zheng, Yin, & Li, 2019; Zheng, Yin, & Liu, 2019). Thus, inclusive leadership by principals may be a leadership style that is better adapted to the organizational culture of China's schools.

Based on Locus of Control Theory(Rotter, 1966)and Self-efficacy theory(Bandura & Adams, 1977), Tschannen-Moran, Hoy, and Hoy (1998) define 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. Her study measured teacher efficacy through three dimensions: classroom management, instructional strategies, and student engagement. It is widely accepted by educational researchers, policymakers, and practitioners that teacher efficacy is a fundamental characteristic of teachers and is closely related to their teaching practices , teaching behaviors and the quality of their teaching(Holzberger et al., 2013; Klassen & Tze, 2014). Teacher efficacy influence an individual's goals, actions, and efforts(Skaalvik, 2003). Based on the direct or indirect positive effects of teacher efficacy on improving education and promoting student development, international scholars have also paid much attention to teacher efficacy, including research on the relationship between teacher efficacy and teacher innovative behavior in different countries and regions (Zainal & Matore, 2019). However, there is still a lack of empirical research on the level of teacher efficacy and the relationship between teacher efficacy and teacher innovative behavior in China.

Based on the above statements,the general purpose of this study was to examine the effects of principal inclusive leadership and teacher efficacy on teachers' innovative behaviors. Specifically, this study will answer the following four research questions according to the opinions of the teacher:

1.What is the level of the principal inclusive leadership, teacher efficacy, and teachers' innovative behavior towards junior high school teachers in China?

2.Is there any relationship between the dimensions of principal inclusive leadership towards teachers' innovative behavior among among junior high school teachers?

3.Is there any relationship between the dimensions of teacher efficacy towards teachers' innovative behavior among junior high school teachers?

4.What are the factors predicting teachers' innovative behavior among junior high school teachers?

Theories and hypotheses
Principal's Inclusive Leadership and Teachers' Innovation Behaviour

The relationship between inclusive leadership and innovative behavior can be supported by social exchange theory. The main idea of social exchange theory is that people are involved in and maintain exchange relationships with others under the expectation that they will receive rewards(Blau, 1968).Social exchange is a responsibility relationship that involves an uncertain future responsibility relationship in which one party benefits the other through the

expectation of future rewards, and in which the future rewards are based on mutual trust in fair rewards (Blau, 1968). When a leader provides material or non-material resources to a follower, an emotional social exchange relationship is formed between the leader and the follower that tends to motivate the follower to reciprocate. For most employees, innovative behaviors are typically viewed as personal extra-role behaviors,employees engage in personal extra-role behaviors not only to fulfill existing employment obligations, but also as reward for organization and leadership(Wu & Lee, 2017). As are the innovative behaviors of teachers.

In a school setting, when principals adopt an inclusive leadership style, principals are willing to interact with teachers, respect them, and provide them with assistance, thus promoting positive interpersonal relationships with teachers. Interactions between principals and teachers go beyond economic exchanges and catalyze emotional relationships. Teachers seek to build social relationships with principals to maximize their own interests, so they want to invest more in reciprocal organizational activities to strengthen ties. Thus, from a social exchange perspective, the principal provides teachers with non-material resources such as motivation, assistance, and positive emotions by inclusive leadership practices. According to the principle of reciprocity, there is a feedback loop in the interaction, a two-way "benefit" where teachers receive benefits from the principal while giving back to the principal and the organization(Cook & Emerson, 1987).

In addition, by reviewing the existing studies, we obtained some findings as follows:

First of all,inclusive leadership by principals creates a safe work environment for teachers and increases their motivation to take innovative risks. Because innovative behavior implies challenging what has been accepted by the organization, which is often accompanied by high risk and uncertainty (Madjar, Greenberg, & Chen, 2011; Venkataramani, Richter, & Clarke, 2014), teachers do not have the motivation to engage in innovative behavior. Inclusive leaders tend to encourage employees to come up with new ideas and encourage them to actively participate in decision making, and they are allowed to practice new methods that may violate norms (Carmeli et al., 2010). And inclusive leaders rationally tolerate employees' mistakes, listen to them seriously, and provide encouragement and guidance when they make mistakes(Randel et al., 2018). Inclusive principals also pay more attention to quality communication with teachers, and when the quality of communication between them is high, teachers are more willing to express their unique ideas to their superiors and take creative risks. Thus, it can be argued that inclusive leadership increases teachers' security to innovate and motivation to innovate.

Secondly,teachers have greater autonomy in principle inclusive leadership contexts, which facilitates innovative teacher behavior. The degree of control is an important factor that influences employee autonomy(Yan, Chong, & Mak, 2010). Innovative behavior can only occur with effective interactions between teachers, administrators, and students (Nemeržitski et al.). Inclusive leadership allows employees to ensure participation in decision-making(Carmeli et al., 2010) ,supports the generation of novel ideas (Sharifirad & Ataei, 2012),and ensures that employees have access to important organizational resources, both tangible and intangible(E. P Hollander, 2009), which helps employees to generate, promote, and implement new ideas(Afsar, Badir, & Saeed, 2014; Scott & Bruce, 1994). Thus, inclusive leadership seems to promote innovative behaviors among teachers.

Finally, inclusive leaders' tolerance for diversity promotes innovative behaviors in their subordinates. Finding new and better solutions and innovations require different ways of thinking, which is why diversity drives innovation(Ostrom, 2008).Inclusive leadership focuses on consciously including and appreciating the contributions of all stakeholders in a

community or organization. Inclusive leadership is a style of leadership that appreciates diversity, invites and welcomes everyone to contribute, and encourages everyone to participate in decision-making and shaping reality. With the goal of creativity, change, and innovation, inclusive leadership focuses on individuals at risk of exclusion, cares about their needs, desires, and potentials, and empowers each individual to participate fully while balancing their needs(Paola, Angelica, & Anne, 2016). Aboramadan et al. (2021) confirmed that supportive behaviors of inclusive leadership encouraged voluntary behaviors and enhanced innovative behaviors of employees. Based on the above discussion, the hypothesis of this study is formulated:

Hypothesis 1: There is significant relationship between the dimensions of principal inclusive leadership with teachers' innovative behaviour among junior high school teachers

Teacher Efficacy and Teachers' Innovation Behaviour

Social cognitive theory can explain the relationship between teacher efficacy and teacher innovation behavior.Social Cognitive Theory Individuals' cognitions, behaviors, and environments interact with each other, with an individual's internal beliefs having the greatest impact on an individual's behavior(Bandura, 1989). Self-efficacy can influence human behavior(Bandura, 1997). Self-efficacy may affect human behavior through many different processes. First, self-efficacy affects how people take on tasks so that they are willing to perform tasks that they believe they can successfully accomplish. Second, self-efficacy affects the amount of effort people put into a task, including their perseverance. Finally, self-efficacy affects how people respond to approaching a goal, which in turn affects the degree to which the task is successfully accomplished (Zainal & Matore, 2019). Simply put, individuals are more likely to take action to achieve a goal when they believe they can produce the desired outcome through their actions(Noreña-Chavez & Guevara, 2020).This is because the level of self-efficacy influences motivation, effort, perseverance in the face of difficulties, emotional stability, and stress levels (Bandura & Locke, 2003). Thus, high levels of self-efficacy increase the determination of individuals to perform better in the pursuit of success(Segal et al., 2005). This is highly relevant to innovative behaviors because creative activities and innovative behaviors are known as difficult activities with high risk of failure and uncertainty(Li et al., 2017; Mumtaz & Parahoo, 2020). Therefore, engaging in innovation-related activities requires individuals to be courageous and willing to face possible uncertainties and risks. However, individuals with high self-efficacy are clearly more willing and courageous to take risks (Mumtaz & Parahoo, 2020). In fact, they believe that they are capable of performing their duties according to established standards(Bandura, 1989).

In addition, past research has developed that teacher efficacy has an impact on teachers' innovative behaviors. Teacher efficacy can be seen as the basis of teachers' innovative behavior(Nemeržitski et al., 2013). Teachers with a high sense of teacher efficacy are more willing to support, implement, and create positive change, persevere through challenges, are open to new ideas, and are willing to experiment with new teaching strategies and methods to better meet the needs of their students, even when it is perceived as risky(Charalambous & Philippou, 2010; Tschannen-Moran & Hoy, 2001; Wheatley, 2002). The TALIS survey found that personal feelings of teaching efficacy are related to instructional experimentation, including a willingness to try out a variety of materials and methods, a search for better teaching methods, and a desire for progress and innovative approaches (Loogma et al., 2013; OECD, 2019). Teachers with a strong sense of self-efficacy tend to cope better with setbacks and failures in their innovative behaviors; therefore, teachers with a strong sense of self-

efficacy have more innovative behaviors(Hoy, 2000). Therefore, the following hypotheses were formulated for this study:

Hypothesis 2: There is significant relationship between the dimensions of teacher efficacy with teatchers' innovative behaviour among junior high school teachers

Teacher Efficacy, Principal's Inclusive Leadership and Teachers' Innovative Behaviour

Zainal and Matore (2019) and LING (2016) proved teacher efficacy contribute to teachers' innovative behavior. Furthermore, in the research on inclusive leadership, scholars in the fields of healthcare and business have verified that inclusive leadership is a predictor of employee innovative behavior(Carmeli et al., 2010). Moreover,Castillo-Acobo et al. (2022) found that inclusive leaders have a direct impact on innovative teaching behaviors. Nguyen et al. (2022) verified that inclusive leadership has a positive impact on knowledge sharing, innovative climate, and creative teaching.Therefore, the following hypotheses were proposed for this study.

Hypothesis 3:Teacher efficacy and principal inclusive leadership significantly predict the variance in teatchers' innovative behaviour.

Method

Research Design

This study examined the relationship between principals' inclusive leadership, teacher efficacy, and teachers' innovative behaviors with a relational survey model.The relational survey model is a model used to determine whether two or more variables have common change or degree (Karasar, 2009). Within this scope, principal inclusive leadership, teacher efficacy were designed as the independent variables,teachers' innovative behavior was the dependent variable.

Population and Sampling

Guangxi Zhuang Autonomous Region (Guangxi) is one of the 34 provincial administrative regions in China.In 2021, there were 2,024 public junior high schools (grade7-10）with 172,131 teachers in Guangxi.By using the Cochran (1977) formula,the confidence interval (CI) was accepted to be 0.99 and the margin of error was 0.05, the minimum sample size for this study was calculated to be 664.

Equal proportions sampling technique was used. Based on the number of junior high school teachers in each city as a percentage of the population, the equal proportions method was used to calculate the number of questionnaires distributed in each city. 864 questionnaires were distributed and 179 public junior high schools in 12 cities participated in the survey, with five teachers randomly selected from each participating school to complete the questionnaire. 858 questionnaires were recovered, with a recovery rate of 99.31%. There were 671 valid questionnaires with a validity rate of 78.21%. 671 samples exceeded the minimum sample size for this study.

In terms of the gender of the sample, 76% were female and 24% were male. Han ethnicity accounted for 56.3%, while ethnic minorities accounted for 43.7%. Teachers with 10 years of teaching experience or less accounted for 51.6%, while those with more than 10 years of teaching experience accounted for 48.5%. Teachers of language, mathematics and English accounted for 55.7%, and teachers of history, politics, geography, physics, chemistry, biology, fine arts, information technology and psychology accounted for 44.6%. In terms of region, 55.1% of teachers are in urban schools, 30.1% in county schools and 14.8% in township schools.

Instruments

Principal's Inclusive Leadership Scale

This scale was developed by Carmeli et al. (2010) to measure leaders' levels of exhibiting inclusive leadershipp behaviors,and it was adapted by Zhou and Mou (2021),Nair and Sivakumar (2020),Uzair-ul-Hussan and Hassan (2018) to measure principals' inclusive leadership behaviors.The scale consists of three dimensions and 9 items on a 5-point Likert scale. These dimensions are openness, accessibility, availability. Exploratory factor analysis (EFA) was performed for this scale. The Kaiser-MeyerOlkin (KMO) value is 0 .96 and the result of the Bartlett test of Sphericity was significant ($\chi2$ = 8,277.93, p:0.00). The factor analysis showed that the scale had a unidimensional structure,the variance explained by the single factor was83.77%. Hence, the scale had a unidimensional structure. The factor loadings of the items ranged between 0.89 and0 .94. The Cronbach's Alpha coefficient is 0.98. The item-total correlation coefficients were between0 .86 and0 .92.

Teacher Efficacy Scale

This scale was developed by Tschannen-Moran and Hoy (2001) to determine teacher efficacy. It is rated on a 5-point Likert scale, and includes three dimensions with 24 items. The three dimensions are teaching strategy efficacy, classroom management efficacy, and student engagement efficacy. The results of the EFA show the Kaiser-Meyer-Olkin (KMO) value is 0.97 and the result of the Bartlett test of Sphericity was significant ($\chi2$ = 13587.12, p:0.00). The factor analysis showed that the scale had a unidimensional structure,the total variance explained by the scale was 64.48%. The factor loadings of the items ranged between 0.56 and .81. As for the reliability of the scale, the Cronbach's Alpha coefficient was0 .97, and the item-total correlation coefficients were between 0.60and 0 .80.

Teachers' Innovative Behaviour

This scale was developed by Zainal and Matore (2021) to measure teachers' innovation behavior to their work, and contains four dimensions (exploring opportunities, generating ideas, promoting ideasand realizing ideas) and it is rated on a 5-point Likert scale with 20 items. According to the results of the EFA, the Kaiser-Meyer-Olkin (KMO) value is 0.96 and the result of the Bartlett test of Sphericity was significant ($\chi2$ =9934.63, p:0.00). The factor analysis showed that the scale had a unidimensional structure, and the variance explained by this single dimension was 67.93%. The factor loadings of the items ranged between0.54 and 0.84. The Cronbach's Alpha coefficient was 0.96, and the item-total correlation coefficients were between 0.49 and 0.76.

Analytical Strategy

Data were analyzed using SPSS 27.0.1.0. Means and standard deviations were tested to know the level of the variables. Correlation analysis was used to determine the relationship between the variables. Regression analysis was used to determine the predictive power of the independent variables on the dependent variable. Frequency and percentage values were calculated to determine the demographic characteristics of the teachers. Data were analyzed using arithmetic means, standard deviations, frequencies, Pearson correlation, and regression.The five-point Likert scale can be averaged into three levels:low (1-2.33), medium (2.34-3.66), and high (3.67-5.00)(Nunnally & Bernstein, 1994). For Pearson's correlation analysis interpretation, the strength of correlation ranging r=0.1 to 0.29 is weak, r= 0.30 to 0.49 is moderate and r = 0.50 to 1.0 is strong(Cohen, 2013).

Exploratory data analysis (EDA) is performed before inferential statistics are processed to confirm that the data meets the hypothesis of the analysis.The normality of the data was tested to meet the assumptions of the regression analysis. Skewness and kurtosis values are used to test whether the data are normally distributed. Skewness values between -0.84 and 0.27, kurtosis values between -0.223 and 0.677. Skewness and kurtosis values between +1 and -1 indicate that the data are close to a normal distribution(Tabachnick & Fidell, 2007).In addition, the P-P plot graph was examined for the assumption of normality,the data is not much skewed. Hence,we assumed that the data were distributed normally.Furthermore, multicollinearity, variance inflation (VIF), and tolerance values were also examined. The VIF values of all dimensions of inclusive leadership and teacher efficacy of principals are range from 1.227 to7.023, tolerance values are range from 0.142 to 0.815.According to Pallant (2020),Salkind (2006),VIF less than 10, tolerance values greater than 0.1 indicate that colinearity is irrelevant and the model is well constructed, and if the VIF values are greater than 10, tolerance values less than 0.1 the model is poorly constructed.

Results

Descriptive analysis was conducted to obtain the means and standard deviations of principal inclusive leadership, teacher efficacy and teacher innovative behavior and their dimensions. The results are shown in Table 1.

Table1
Results of descriptive analysis of variables

	Dimensions	Mean	Level	SD
1	Openness	3.923	high	0.918
2	Availability	3.822	high	0.929
3	Accessibility	3.843	high	0.967
4	Principals' Inclusive Leadership	3.860	high	0.899
5	Teaching Strategy Efficacy	3.941	high	0.555
6	Classroom Management Efficacy	3.975	high	0.598
7	Student Engagement Efficacy	3.836	high	0.590
8	Teacher Efficacy	3.917	high	0.559
9	Explore Opportunities	3.726	high	0.582
10	Generate Ideas	3.623	high	0.624
11	Promote Ideas	3.244	Moderate	0.755
12	Realise Ideas	3.369	Moderate	0.709
13	Teachers' Innovative Behaviour	3.491	Moderate	0.589

Note: Low (1<M<10.33, Moderate (20.34<M<30.66), High (30.67<M<5); N= 671.

The Levels of Principals' Inclusive Leadership Dimensions
From Table 1,the overall principal inclusive leadership (M= 3.860, SD=0.899) was at a high level, as well as all sub-dimensions of openness (M=3.923, SD=0.918), availability (M= 3.822, SD=0.929) and accessibility (M=3.843, SD=0.967).
The Levels of Teacher Efficacy Dimensions
As shown in Table 1. Teachers' perceptions of overall teacher efficacy (M=3.917, SD=0.559) was at a high level, as well as all sub-dimensions. Sub-dimensions of the teacher efficacy are shown below: teaching strategy efficacy(M=3.941,SD=0.555),classroom

management efficacy (M=3.975, SD=0.598),student engagement efficacy (M=3.836, SD=0.590).

The Level of Teachers' Innovative Behavior Dimensions

Teachers' perceptions of teachers' innovative behaviors are shown in Table1. The overall teachers' innovative behavior water is at moderate(M=3.491, SD=0.589). Sub-dimensions of explore opportunities (M=3.726, SD=0.582), generate ideas were at a high level (M= 3.623, SD=0.624), promote ideas (M= 3.244, SD=0.755), and realise ideas (M= 3.369, SD= 0.709) were at a moderate level.

Relationship between Dimensions of Principal Inclusive Leadership and Teachers' Innovative Behaviour

Based on the table 2, principal inclusive leadership was significantly correlated with teachers' innovative behaviors(r=0.348, p<0.01).The dimensions such as openness (r=0.311, p<0.01), availability (r=0.346, p<0.01) and accessibility (r=.0.347, p<0.01) were positively significant with teachers' innovative behaviors. In addition, the correlations were in moderate strength. The result indicates that an increase in principal inclusive leadership will increase teachers' innovative behaviors practices moderately in general. Therefore, the result supports hypothesis H1 which was formulated to explain the correlation for principal inclusive leadership towards teachers' innovative behaviors.

Table2
Results of Pearson's correlation analysis of variables

	Dimensions	1	2	3	4	5	6	7	8	13
1	Openness	——								
2	Availability	0.899 **	——							
3	Accessibility	0.837 **	0.907 **	——						
4	Principals' Inclusive Leadership	0.953 **	0.982 **	0.941**	——					
5	Teaching Strategy Efficacy	0.354 **	0.365 **	0.387*	0.380 **	——				
6	Classroom Management Efficacy	0.365 **	0.373 **	0.391*	0.389 **	0.882 **	——			
7	Student Engagement Efficacy	0.391 **	0.424 **	0.429*	0.430 **	0.892 **	0.899 **	——		
8	Teacher Efficacy	0.385 **	0.402 **	0.418*	0.416 **	0.958 **	0.964 **	0.967 **	——	
13	Teachers' Innovative Behaviour	0.311 **	0.346 **	0.347*	0.348 **	0.607 **	0.567 **	0.648 **	0.631 **	——

Note:*p<0.05，**p<0.01，***p<0.001 (two-tailed); N= 671.

Relationship between Dimensions of Teacher Efficacy and Teachers' Innovative Behaviour

As shown in Table 2, teacher efficacy was significantly correlated with teachers' innovative behaviors (r=0.631, p<0.01). The dimension such as teaching strategy efficacy

(r=0.607, p<0.01) classroom management efficacy (r=.567, p<0.01), student engagement efficacy (r=.648, p<0.01) were positively significant with teachers' innovative behaviors. In addition,

the correlations were in strong strength. The result indicates that an increase teacher efficacy will increase teachers' innovative behaviors significantly. Therefore, the result supports hypothesis H2 which was formulated to explain the correlation for sources of teacher efficacy towards teachers' innovative behaviors.

Factors Predicting Teachers' Innovative Behaviour

A multiple regression was performed to answer question No. 4 of the research which is to determine the most dominant factor influencing teachers' innovative behaviors among the respondents. A four variable mixed logistic regression(MLR) model was proposed to explain the variation of teachers' innovative behaviors. The variables involved were principal inclusive leadership (X_1), and teacher efficacy (X_2). The equation of proposed MLR model was a follows:

Equation 1:

$Y(TIB) = b_0 + b_1(X_1) + b_2(X_2) + e$

Where: Y=Teachers' Innovative Behaviour (TIB)

$\quad\quad b_0$=Constant (Intercept)

$\quad\quad b_{1-2}$ =Estimates (Regression coefficients)

$\quad\quad X_1$=Principal Inclusive Leadership

$\quad\quad X_2$=Teacher Efficacy

$\quad\quad e$=error

Table 3

Regression model summary

Model	R	R Square	Adjusted R Square	Square Std. Error of the Estimate	Durbin-Watson
1	0.638[a]	0.406	0.405	0.45482	1.852

a. Predictors: (Constant), principal inclusive leadership, teacher efficacy

Table 4

Variance analysis of the regression model

	Sum of Squares	df	Mean Square	F	P-Value
Regression	94.621	2	47.311	228.705	0.001
Residual	138.184	668	0.207		
Total	232.806	670			

a. Dependent Variable: Teachers' innovative behaviour

b. Predictors: (Constant), principal inclusive leadership, teacher efficacy

Table 5
Multiple regression coefficient analysis

Variable	Non-Standardised Coefficient		Standardised Coefficient	t	P-Value
	B	S.E.	Beta		
Constant	0.804	0.127		6.324	0
Principal's Inclusive Leadership	0.068	0.021	0.103	3.158	0.002
Teacher Efficacy	0.619	0.035	0.588	17.928	0

a. Dependent Variable:Teachers' innovative behaviour

Based on the analysis,as shown in tables 3,4and5, the regression model was significant $(F(2,668) = 228.705, p < 0.001, and R^2 = 0.406)$ and both factors of principal inclusive leadership (b = 0.068, t =3.158, p < 0.001) and teacher efficacy (b = 17.928, t = 9.887, p < 0.001) in this study were significant predictors of teachers' innovative behaviors.

The regression analysis results also revealed that, overall,principal inclusive leadership practice and teacher efficacy could explain40.6% of the variance in teachers' innovative behaviors (R2 = 0.406), while the remaining 59.4% of the variance was explained by other factors that were not examined in this study .

Based on the recommendations of Meyers et al. (2016),Pallant (2020) regarding the relative contribution of each independent variable, we refer to the weighted Beta value, which is well known as the standardized coefficient value. The standardized coefficient value is used to compare the contribution of each independent variable, and the higher the standardized coefficient value, the greater the influence or contribution of that independent variable to the dependent variable(Pallant, 2020).

Based on Table 5, the standardised coefficient value of teachers efficacy (0.588) was higher than the standardised coefficient value of principal inclusive leadership practices (0.103). This shows that teacher efficacy had a higher effect on teachers' innovative behaviors than principal inclusive leadership practices.

Overall, the contribution of the two independent variables of principal inclusive leadership practices and teachers efficacy to the variation of change in teachers' innovative behaviour can be shaped through a regression equation model. Based on the findings of the analysis obtained in Table 4 the MLR model for this study can be formed as follows:

Teachers' Innovative Behaviour = 0.804+(0.068)Principal's Inclusive Leadership+(0.619) Teacher Efficacy

From this equation, it can be summarised that every increase in one unit of principal's inclusive leadership will also increase the teachers'innovative behaviour by 0.068 units, while every addition to one unit of teacher efficacy will further increase teachers' innovative behaviour by 0.619 units.Thus, hypothesis H3 was accepted.

Discussion

This study examined the relationship between principal inclusive leadership, teacher efficacy, and teachers' innovative behaviors among junior high school teachers in Guangxi, China. The results of the descriptive analyses indicated that teachers' perceptions of principals' inclusive leadership, teacher efficacy were at high levels.Teachers' perceptions of teachers' innovative behaviors were at moderate levels,explore opportunities and generate ideas dimensions at high level, promote ideas and realize ideas dimensions at medium level.

The result indicate that teacher innovation behaviors are insufficient, especially the promote ideas and realize ideas dimensions.

Another result revealed the dimensions of principal inclusive leadership have a positive impact on teachers' innovative behaviors.The correlation is at medium strength.Therefore, principal inclusive leadership behaviors are important in increasing teachers' innovative behaviour.Innovative behaviors are out-of-role behaviors that teachers spontaneously choose, and principals' leadership styles can influence teachers' innovative behaviors. Principal inclusive leadership practices that maintain the relationship of openness, availability, and accessibility with teachers are conducive to teachers' innovative behaviors. Inclusive leadership enhances teachers' sense of belonging to the organization through effective communication, valuing the voices of employees, and creating a safe environment for innovation, which motivates teachers to break through organizational rigidity and prompts them to implement innovative behaviors. These results are consistent with previous research,such as study in healthcare and business organizations found that inclusive leadership behaviors contribute positively to followers' innovative behaviors at work(Guo et al., 2023; Javed et al., 2019; Qi et al., 2019; Wang et al., 2019). Ross and Bruce (2007) and Messmann and Mulder (2011) found that positive communication with others influences innovative behaviour, guidance, support, and feedback from colleagues, managers, and others positively impact teachers' innovative behaviour. Inclusive leadership is positively associated with teacher creativity in the workplace,when leaders demonstrate openness to teachers' opinions, they readily engage with teachers to discuss new ideas,and stimulate teachers' creativity in the workplace(Uzair-ul-Hussan & Hassan, 2018).

Additionally,this study also reveals that teachers' perceived teacher efficacy dimensions have a positive and strong correlation with teachers' innovative behaviors. Therefore, when teachers' efficacy is high, they are more likely to exhibit innovative behavior. As teachers' perceived teacher efficacy increases, teachers' innovative behaviors also increase. In other words, when teachers believe they can accomplish a task, they become more committed to doing it better or even making a breakthrough. Teachers with a high sense of efficacy are more likely to engage in challenging and creative practices, more likely to identify new problems and propose new solutions in their innovative actions, and better able to cope with the challenges that arise in implementing new ideas. They are more likely to respond positively to unknown problems and difficulties, thereby reducing the risks associated with innovation, and they are more tolerant of failure in innovation.This finding is consistent with the findings of some scholars.Tschannen-Moran and Hoy (2001)found strong sense of efficacy enables teachers to use new teaching methods.The TALIS investigation found that personal with high teaching efficacy more willingness to try a variety of materials and methods, more willingness to search for better ways of teaching and the desire to implement progressive and innovative approaches(Loogma et al., 2013). Teachers with a strong sense of efficacy are open to new ideas and are more willing to try new approaches to better meet the needs of their students(Tschannen-Moran & Woolfolk Hoy, 2002).Avsec and Savec (2021) found that self-efficacy had both direct and indirect effects on innovative behaviour.

Finally, this study also verified that both independent variables, principal inclusive leadership and teacher efficacy, had a significant effect on teachers' innovative behavior.Specifically, principal inclusive leadership and teacher efficacy are factors that influence teachers' innovative behavior, which explains 40.5% of the total variance. This value is sufficient to demonstrate the importance or influence of these two variables on teachers' innovative behavior. This is because for research in the field of social sciences this value of

more than 30% already indicates that the independent variable has a significant contribution to the dependent variable(Delen, 2014). The results of the study are similar to the findings of some scholars that leadership and teacher efficacy are considered to be the most important factors influencing teachers' innovative behavior(Thurlings et al., 2015; Zainal & Matore, 2019).This result also indirectly shows that 59.5% of the variance in teachers' innovative behavior is determined by other variables. It means that teachers' innovative behavior is also influenced by many other factors that are not included in this study, such as personal factors, family factors, and external factors.

Conclusion and implications

The study presents teachers' perceived principal inclusive leadership and teacher efficacy at a good level, but the level of innovative teacher behaviors is not sufficiently .Many factors (such as the development of schools, the effectiveness of instruction, a strong school culture, student achievement, and teacher performance) are related to teachers' innovative behaviour, the results showed that both inclusive leadership and teacher efficacy positively affect teacher innovative behavior, and these two variables contribute significantly to teacher innovative behavior. In particular, teacher efficacy has a significant impact on teacher innovative behavior, and an increase in teacher efficacy triggers a significant improvement in teachers' innovative behavior.

Based on the above findings, the principal, as the highest administrative leader of the school, should take the responsibility of stimulating teachers' innovative behaviors. The procedural work process should be reduced to liberate the principal, increase the opportunities and time the principal spends with teachers, and keep the communication channels between teachers and principals open. Principals actively provide help and support to teachers, appreciate the effectiveness of their work, listen to their different ideas, and help teachers to improve their professional self-confidence and their courage to solve problems and overcome difficulties, which are necessary for innovative behavior. Inclusive leadership is incorporated into principal training programs to improve principals' ability to practice inclusive leadership and to transform their hierarchical and authoritarian leadership ideology.

Meanwhile, based on the importance of teacher efficacy to teachers' innovative behavior, on the one hand, schools should create conditions for teacher efficacy to improve teachers' efficiency and innovative behavior. For example, provide teachers with professional training and learning opportunities to improve their professionalism. Establish a scientific incentive mechanism to strengthen teachers' professional self-confidence and improve internal drive. Build an organizational atmosphere of love of learning and striving for excellence. On the other hand, teachers should also develop the habit of lifelong learning, establish a developmental mindset, and improve their self-efficacy by genuinely improving their professional competence.

In addition teacher's innovative behavior is also affected by many other factors, such as personal factors, environmental factors, researchers should continue to explore the antecedents of teacher's innovative behavior, and then provide effective suggestions to stimulate teacher's innovative behavior. While school administrators can stimulate teacher innovative behavior by improving inclusive leadership practices and teacher efficacy, they should also pay attention to other possible influences to establish a more comprehensive path to improve teacher innovative behavior.

Limitations

However, there are some limitations of this study. The limitation of data collection is that inclusive leadership behaviors, teacher efficacy, and teacher innovative behaviors were studied based on teachers' perceptions only. In this regard, further research should collect data from different sources and points in time, such as bilateral data from principals and teachers, external evaluations, or objective statistics on innovative behaviors, number of scholarly papers and awards for teaching achievements, for example. The scope of the study could also be expanded to improve the representativeness of the sample. More complex relationships between the three variables could also be explored, for example by adding mediating variables.

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