

The relationship between school climate and general teachers' attitude toward inclusion in China: the mediation effect of teachers' efficacy

Wangqian Fu¹ , Xiaohan He^{2*}, Ying Sun³, Chonggao Wang¹, Jingyi Wang⁴ and Yuhan Dong¹

¹School of Special Education, Beijing Normal University, Beijing, China; ²Faculty of Education, The University of Malaya, Kuala Lumpur, Malaysia; ³Beijing Institute of Educational Science, Beijing, China; ⁴School of Journalism and Communication, Beijing Normal University, Beijing, China

The prosperity of inclusion of students with disabilities largely rest on the attitudes of mainstream teachers. Few studies explore the relationship among school climate, teachers' attitude on inclusion and teachers' efficacy in China. This study surveyed 266 general teachers in China to understand the role of teachers' efficacy on inclusive education between school climate and teachers' attitude. The results indicated that teachers hold positive attitudes towards inclusion on average, especially in the dimension of affection. Additionally, school climate, teachers' efficacy and teachers' attitude were significantly associated, and the mediating effect of teachers' efficacy between school climate and teachers' attitude were proved by mediation analyses. The findings suggested that creating more inclusive school climate and improving general teachers' knowledge and skills on inclusive education, especially the skills on collaboration with others, which could contribute to promote more positive attitude on inclusive education of general teachers.

Keywords: School climate; general teachers' attitude toward inclusion; teachers' efficacy

Instruction

The basic proposition of inclusive education was stated by The Salamanca Statement in 1994, stating that education must satisfy the needs of all children and the educational institutions for ordinary children should also accept all kinds of children and adolescents with special needs in their respective areas (UNESCO 1994). In recent decades, developing inclusive educational practices has become a worldwide movement (Khochen-Bagshaw 2020, Mcilvaine 2020), including China. Recently, Chinese government pays more attention on inclusive education for children with disabilities and issued a series of policies. Special Education Promotion Plan (2014–2016) enacted by Ministry of Education *et al.* (MOE) in 2014 proposed to comprehensively promote inclusive education (Central People's Government 2017). Thereupon, MOE (2020a) issued a specific policy in inclusive education named Opinions on Strengthening the Work of Students with

Disabilities Learning in Regular Elementary Schools. It demands education administrative departments at the county level shall ensure that students with disabilities can learn in regular schools and give priority to children and adolescents with disabilities' enrollment in general schools. Due to the policy of promoting inclusive education, the scale of enrolled students with disabilities learning in regular schools is grand. In 2019, there are 394 thousand students with disabilities studying in general schools, with a proportion about 49.2% of all students with disabilities in China (MOE 2020b).

Even though the large scale of inclusive education in China, the preparation of inclusive education is still on construction. It is not until 2019, the Department of Teachers' Affairs in MOE requesting the subject of special education subject should be gradually added to the teacher qualification examinations for primary and secondary schools from 2020 (MOE 2020c). Before that, most general teachers did learn knowledge and skills of special education in their pre-teacher training programs. The Opinions on Strengthening the Work of Students with Disabilities Learning in Regular Elementary

Correspondence to: Wangqian Fu, School of Special Education, Beijing Normal University, Beijing, 100875 China. Email: tiffanyfu001@163.com
*Xiaohan He served as the co-first author.

Schools (2020) try to improve the profession of teachers as well. It states schools all over the country should select outstanding teachers with certain special education qualities, more benevolence and sense of responsibility to serve as the head teachers and teachers of the classes for children with disabilities. This shows the preparation of general teachers to implement inclusive education is still in the process of gradual development.

Successful inclusive education can not only provide equal access in education to all children but also, more importantly, provide appropriate education to students to achieve positive outcomes (Erten and Savage 2012, Messiou 2017). However, the quality of inclusive education is questioned by scholars (Deng and Zhao 2019, Wei et al. 2017, Lei et al. 2017), a primary school teachers (He 2019) and parents (Chen et al. 2019), which is affected by many factors, including classification of students with special needs, role assignment between special education staff, support personnel, and mainstream teachers, and attitudes among other stakeholders (Du and Fen 2019, Alquraini 2012, Bhatnagar and Das 2014, Bornman and Donohue 2013). Among them, the key factors of implementing inclusive education are the principles of teachers towards inclusive education and teachers' attitudes towards students with disabilities (Bender et al. 1995, De Boer et al. 2011, Hellmich et al. 2019, Pang 2017).

Thaver and Lim (2014) considered the prosperity of inclusion of students with disabilities largely rest on the attitudes of mainstream teachers, for instance, when they hold disapproving attitudes, they less frequently implement inclusive educational strategies (e.g. Bender et al. 1995, Singh et al. 2020, He 2019). Furthermore, apathetic or even passive attitudes among mainstream teachers have highly destructive effects on students with disabilities, such as isolation, psychosocial stress, and a deepened sense of vulnerability caused by their disabilities (Hogan et al. 2000, Holzbauer 2004, Tregaskis 2000). For example, due to disabilities, it is difficult for affected students to get equally high academic scores as mainstream students. This further exacerbates teachers' neglect of the potential of students with disabilities. It follows that teachers' attitudes play an essential role in the development of students with disabilities and inclusive education.

The influence of school climate on teachers' attitudes towards inclusive education

Dozens of researches found numerous factors affecting teachers' attitudes toward inclusive education, and they can be reduced to teacher-level characteristics, students' factors, and educational environment factors (e.g. school climate). School climate is one of the most important influencing factors (Wilson 2020, Zhu et al. 2009) determining the success or failure of inclusive education. It is a relatively stable and lasting

environmental feature in a school that is experienced and influenced by the school members (Hoy and Hannum 1997, Wang et al. 2020). It covers the interaction and relationship between teachers, parents, students... (Haynes 1993), participation of school activities among children with special needs, cooperation and support of general and special education teachers, support from school principals, and school practice activities (Schaefer 2010). The involvement of headmasters and other managements and the cooperation achieved by other teaching staff determine the success of inclusive education (Wang et al. 2020, Mayrowetz and Weinstein 1999, Mamlin 1999, Ainscow 2000).

Some studies have initiated the discussion of the relationship between the effect of school climate of inclusive education and teachers' attitudes towards inclusive education. Weisel and Dror (2006) suggested that school climate contains six dimensions: supporting leadership, renovations, cooperative relationship, workload, autonomy, and prestige. They found a positive correlation between school climate and teachers' positive attitudes towards inclusive education. The correlation critically demonstrated aspects of supportive leadership, autonomy, and cooperation and teachers' attitude on inclusive education. Maxwell (2016) believed there are significant predictive effects of school climate of inclusive education on teachers' attitude towards inclusive education. Collaboration among teachers is the factor connecting with teachers' positive attitudes towards inclusive education (Schulman 2002, Soodak et al. 1998). The autonomy in a school climate encourages positive attitudes towards inclusive education (Sheynin 1990) as well. Teachers would be more willing to accept students with disabilities learning in their regular classrooms if the management departments create a supportive climate (Soodak et al. 1998, Wang et al. 2020) and give teachers autonomy in instructions.

The mediating effect of teachers' efficacy between school climate and teachers' attitude

The self-efficacy towards inclusive education is a specific expression of the sense of efficacy in inclusive education. It is a self-perception of achieving expected educational and teaching objectives and finishing inclusive education practical work successfully (Park et al. 2016). Bandura argued (1977) that self-efficacy is defined as 'beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments. Base on this idea, some scholars argued that sense of self-efficacy relies on four sources: mastery experiences, vicarious experiences, social persuasion, and somatic and emotional states (Fernandez et al. 2016, Morris et al. 2017). Generally, collaboration, managing behavior, and inclusive instruction are regarded as the dimensions of self-efficacy towards

inclusive education (Savolainen *et al.* 2012). Teachers may present various in different abilities of inclusive education needed. Alnahdi (2020) investigated teachers' self-efficacy to teach in inclusive classrooms in Saudi Arabia, and found teachers' efficacy scored low in abilities such as involving families in school activities, raising awareness regarding laws and policies related to the inclusion of students with disabilities, and dealing with physically aggressive students, while felt better to get children to follow classroom rules, make parents feel comfortable about coming to school, and provide alternate explanations for students.

Teachers' self-efficacy, collective efficacy, and the experiences already acquired in teaching children with special needs intimately interact with attitudes towards inclusion (Urton *et al.* 2014). There would be more positive views of educating children with special needs in regular classroom when teachers got higher self-efficacy (Savolainen *et al.* 2012). High self-efficacy of teachers is related to effective and positive teaching behaviours, which are very important for inclusive education (Schwab *et al.* 2017). Specifically, if teachers obtain a higher sense of efficiency, they would provide less referral behaviors, more positive coping styles to deal with students' problematic behaviors, and diversified instructional approaches for special educational needs (SEN) (Wertheim and Leyser 2002). The predictive functions of self-efficacy towards inclusion between teachers' attitudes towards inclusion were illustrated further by scholars in America, Europe, Africa and Asia (e.g. Savolainen *et al.* 2012, Savolainen *et al.* 2020, Emam and Mohamed 2011, Malinen *et al.* 2012, Thaver and Lim 2014).

Savolainen *et al.* (2020) considered that an abundance of studies have assessed teachers' attitude and self-efficacy beliefs related to inclusive education in the past decades. However, most studies about the above variables have only been carried out in a single relationship between each variable. A deeper relationship among each variable should be emphasized. It is normally an investigation of mediating effects that is pointed out by clinical psychologists and developmental psychologists (MacKinnon and Fairchild 2009, MacKinnon *et al.* 2007). Protheroe (2008) pointed out teacher's efficacy to promote learning can depend on past experiences or school culture and for those with high self-efficacy combined with higher level to cooperate and deal with challenge tasks predicating teachers more positive attitude to inclusion (Weisel and Dror 2006). Therefore the possible mediation role of teachers' perceptions of school climate and the role of teachers' self-efficacy levels could also be further investigated.

Before starting the current study, there were several preliminary studies about the correlation between teachers' efficacy, school climate and teachers' attitude

toward inclusion provided circumstantial evidences for the mediating path: school climate toward inclusion → teachers' sense of efficacy toward inclusion → teachers' attitude towards inclusion. Dating from 1998, Sodak *et al.* suggested that collaboration with other teachers mediated the relation of teachers' efficacy beliefs on their feelings of receptivity toward inclusion. Hosford and O'Sullivan (2015) considered that teachers' ratings of the severity and confidence in managing commonly experienced behaviors in inclusive classrooms were influenced by teachers' efficacy and perception of school climate. The investigation of teachers in regular preschools produced by Sun (2017) fingered out that school climate not only had a direct effect, but also an indirect effect on attitude towards inclusion through teacher self-efficacy (the mediating variable). Wilson *et al.* (2020) found self-efficacy acted mediating role between teachers' perceptions of the school climate and reported inclusive behaviour. More precisely, instructional strategies efficacy significantly mediated the relationship between school climate perceptions and reported behaviour.

However, few previous studies explored and proved mediating effect on inclusive education between school climate and teachers' attitude in China. A deeper reciprocal relation between the relation in school climate, teachers' efficacy and teachers' attitude on inclusive education should be investigated in China. To fill in the gaps, correlational and mediating reaction researches are taken by the current study to testify whether school climate influences teachers' efficacy and affects teachers' attitude toward inclusion in China. The following research questions were addressed in the study: 1) What are the relationships among school climate, teachers' efficacy of inclusive education, general teachers' attitude toward inclusive education in China? 2) Whether teachers' efficacy also has moderating effects between school climate and teachers' attitude?

Methods

Participants and procedure

We initial contacted with the principals in general schools a WeChat group, which is a widely used social communication application in China, to ask their help to send questionnaire link in their schools teachers' WeChat groups. The WeChat group of principals was built due to the principals attended the a national training of primary and Secondary school principals in China, in which 8 out of 30 principals were willing to send the instructions for completing the survey and the questionnaire link in their schools' teachers' WeChat groups. All teachers were advised they could voluntarily choose to participate and they would get 2-3RMB award in WeChat after finish the questionnaire.

It is widely understood that the use of larger samples in applications of factor analysis and mediation analysis

Table 1 Summary of demographic information

		N	%
Gender	Male	34	12.8
	Female	232	87.2
Teaching experience	<=3 years	67	25.2
	3–5 years	46	17.3
	6–10 years	27	10.2
	>10 years	126	47.4
Degree	High school	6	2.3
	3-year college	49	18.4
	Bachelor	192	72.2
	Graduate school	19	7.1
School level	Primary school	196	73.7
	Middle school	19	7.1
	High school	51	19.2

tends to provide results such that sample factor loadings are more precise estimates of population loadings and are also more stable, or less variable, across repeated sampling. While opinion and evidence about the question of how large a sample is necessary to adequately achieve these objectives are various. Cattell (1978) believed this ratio of sample size and the number of variables items should be in the range of 3 to 6. To meet the criterion, the sample size should be more than 165 (with 10% invalid questionnaires in assumption) in the study. Finally, a total of 303 teachers from 8 provinces in China (average teaching age of 2.8 years old, 12.0% males) participated in the current study. Participants with more than one-third of the questions are unanswered are eliminated. A total of 266 valid questionnaires were collected with a recovery rate of 87.79%. Table 1 presents the demographic information of participants.

Measures

Inclusive school climate scale (ISCS)

The ISCS is an 23-item scale developed by Emam and Al-Mahdy (2020) including three dimensions, that is, 1) teacher prosocial motivation toward inclusive practices (TPMTIP), this dimension has seven items describing the teachers' competences or qualities in supporting students with SEN (e.g. Teachers show enthusiasm and persistence to fulfill their duties toward students with disabilities). 2) Inclusive leadership (IL), this dimension includes six items relating to the school leader's role in considering and handling students with SEN in school (e.g. The school leader informs teachers of the expected outcomes for students with disabilities.). 3) Academic excellence (AE), this dimension also included six items referring to the school's focus or requirements on the academic achievement outcomes of students with SEN; (e.g. Students with disabilities acquire social and emotional learning outcomes). The scale is a 5-point response scale ranging from 1 = rarely occurs to 5 = very frequently. The construct validity indicates

that three dimensions accounted for about 71.88% of the variance and for each dimension. The variance explained is 30.68% (TPMTIP), 23.20% (IL) and 18% (AE) individually (Emam and Al-Mahdy 2020). The internal consistency coefficient of the test scale in the study was 0.96.

The teacher efficacy for inclusive practice (TEIP) scale

The TEIP is an 18-item scale developed in 2012 on a sample of 609 pre-service teachers selected from four countries (Canada, Australia, China and India) by Sharma *et al.* It included three dimensions, 1) Efficacy in using inclusive instruction (EII). It refers to the strategies that promote the inclusion of all learners (e.g. I can accurately gauge student comprehension of what I have taught). 2) Efficacy in collaboration (EC). It describes an individual's perceptions of teacher efficacy in working with parents and other professionals (e.g. I can assist families in helping their children do well in school). 3) Efficacy in managing behavior (EMB). It refers to self-perceptions of teaching efficacy in dealing with disruptive behaviors (e.g. I am able to calm down a student who is disruptive or noisy). We applied the Chinese version developed by Sun (2017). The scale is a 6-point response scale ranging from 1 = strongly disagree to 6 = strongly agree. A high score indicates a high sense of perceived teaching efficacy for teaching in inclusive classrooms (Sharma *et al.* 2012). The construct validity indicates that the three dimensions accounted for about 64.5% of the variance and for each dimension, the variance explained is 25.45% (EII), 19.8% (EC) and 19% (EMB) individually (Sharma *et al.* 2012), suggesting adequate reliability and a good validity. The internal consistency coefficient of the test scale in the study was 0.97.

Teachers' attitudes towards inclusion: attitudes towards teaching all students (ATTAS-mm)

The ATTAS-mm is the 9-item scale Developed by Gregory and Noto in 2012, including three dimensions: cognitive, affective, and behavioral. The Chinese version is translated by Sun (2017). The cognitive dimension is defined as teachers' belief in that all students can succeed in general education classrooms, while the affective dimension is conceptualized as teachers' development in personal and professional relationships. Behavioral dimension is interpreted as the teachers practices in creating an accepting environment for all students (Gregory and Noto 2012). The original responses are on a 7-point response scale (1 = agree very strongly, 7 = disagree very strongly). Considering the translation issue and understanding of the readers, this study used a revised version form Sun (2016) who adopted a 5-point (1 = strongly agree, 5 = strongly disagree) response scale. The construct validity indicates

Table 2 Descriptive summary of teachers' attitude and their efficacy

Variable	M	SD
Teachers' attitude to inclusive education	3.87	.82
Sub dimension-cognitive	3.37	1.13
Sub dimension-affective	4.20	0.69
Sub dimension-behavioral	3.97	0.88
Teachers' efficacy to inclusive education	5.21	0.74
Sub dimension-EII	5.28	0.72
Sub dimension-EC	5.11	0.84
Sub dimension-EMB	5.27	0.76

that three factors accounted for about 80% of the variance and for each factor, the variance explained is 31.3% (Cognitive), 26.9% (Affective) and 21.6% (Behavioral) individually (Gregory and Noto 2012). The internal consistency coefficient of the test scale in the study was 0.89.

Results

Chinese general education teachers' attitude and efficacy to inclusive education

The first purpose of this study was to assess the level of general education teachers' attitude and efficacy to inclusive education in China. The descriptive statistics was presented in Table 2. Overall, the general education teachers showed medium level of acceptance to inclusive education. Especially in the dimension of affective attitude, the mean was 4.2, much higher than the medium level of 2.5. And the following dimensions were behavioral attitude ($M=3.97$, $SD=0.88$) and cognitive attitude ($M=3.37$, $SD=1.13$) orderly.

Table 2 shows the mean and standard deviation of the teacher efficacy of inclusive practice. The mean score of 5.21 indicates that respondents of the study, on average, manifested a high level of self-efficacy towards inclusion. The sub-dimensions of teachers' efficacy ranked from highest to lowest were efficacy in inclusive instruction ($M=5.28$, $SD=0.72$), efficacy in manager behavior ($M=5.27$, $SD=0.76$) and efficacy in collaboration ($M=5.11$, $SD=0.84$).

Correlations among inclusive school climate, teachers' efficacy, and teachers' attitude

The study also investigated the relationship among all variables. Pearson correlation analysis was applied. And it shows a significant correlation between inclusive school climate and teacher attitude ($r=.528$, $p<.00$), teacher efficacy and teacher attitude ($r=.513$, $p<.00$), school climate and teacher efficacy ($r=.589$, $p<.00$). In other words, there were positive correlations coefficient between school climate and teacher attitude to inclusive education, teacher efficacy and teacher attitude to inclusive education. Therefore, higher inclusive school climate was associated with more positive teachers' attitudes towards inclusion. For teacher with higher efficacy on inclusive education, they held higher

Table 3 Correlation between school climate, teachers' efficacy and teachers' attitude

Variables	1	2	3
1. Inclusive school climate		.589**	.528**
2. Teachers' efficacy			.513**
3. Teachers' attitude			

** $p<0.01$.

positive attitude as well. Besides, significant positive correlations were revealed between inclusive school climate and teachers' attitude (Table 3).

The mediation effect of efficacy between school climate and teachers' attitude

Further regression analysis found that teacher efficacy had an intermediary effect on inclusive school climate and teachers' attitude towards inclusive education (Table 4). The Total effect = 0.47 ($p<0.000$); direct effect = 0.31 ($p<0.001$); indirect effect = 0.17. The result of the proportion of the intermediate effect is equal to the indirect effect/total effect (%) = $0.1655/0.4732=34.97\%$. That means the indirect effect of inclusive school climate on teachers' attitudes through teacher efficacy is 0.17, with a contribution rate of 34.97%, and its bootstrap 95% CI (0.0976, 0.2433). The interval does not contain 0. Therefore, the mediation effect was significant. Teachers' efficacy played partially mediation role on the relationship between school climate and teachers' attitude to inclusive education.

Discussion

Statistics reported from the current study present somewhat positive attitudes towards inclusion on average, especially in the dimension of affection. Teachers' attitude is one of the most important factors implementing inclusive education (Kurniawati et al. 2012, Temberger and Kiswarday 2017). Numerous empirical studies conducted revealed general teachers' attitude toward inclusive education at home and abroad, and the results were various. Singh found the attitude of teachers towards inclusive education was moderate to a favorable level in Bihar, India. A national survey in Finland found the classroom teachers and the subject teachers scored below the neutral midpoint of the scale. Brown-Oyola's (2016) studied on teachers in Pennsylvania of the United States found there was a significant difference of feelings towards inclusive education between general and special education teachers. The former scored significantly lower than the latter. Canadian teachers have shown mixed attitudes towards inclusive education, which are strongly correlated with school factors such as the support of administrators and adequate career development opportunities. There are many studies on teachers' attitude to inclusive education in China as

Table 4 Mediation analyses on teachers' efficacy between school climate and teachers' attitude (2000 bootstraps)

Independent variable (IV)	Dependent variable (DV)	Mediator (M)	Effect of IV on M		Effect of M on DV		Effect of IV on DV		Direct effect		Indirect effect		Total effect	
			Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	95%CI	Coeff	SE
School climate	Teachers' attitude	Teachers' efficacy	0.31***	0.06	0.17***	0.04	0.47***	0.05	0.31***	0.06	0.17***	0.10, -0.24	0.47***	0.05

*** $p < 0.001$.** $p < 0.01$.* $p < 0.05$.

well. The result in our study was consistent with some existing researches. Zhao and Xu (2018) investigated kindergarten teachers in Guilin and found that 58.21% of the participants agreed that inclusive education improves the development of children with special education needs and 62.69% of them support the view that inclusive education can effectively promote the social communication ability for children with special education need. Some research found that general teachers' attitude towards inclusive education is positive in China (Deng 2004, Ma and Tan 2010, Li 2016, Zeng 2007). Liu *et al.* (2000) found 98% of general primary school teachers in their survey believed that children with special education needs were equal with general children in personality, and 95.8% of the participants believed that children with special education needs had equal rights of education with their peers. They exhibit a high rate of support for inclusive education (Deng 2004).

In the sub-scales of teachers' attitude, they scored highest in affective dimension, while lowest in cognitive dimension. That may be closely relate to the lack of training on inclusive education for general schools. On one hand, few normal colleges and universities offer special education or inclusive education courses for subject teachers in China. On the hand, the post-service education of inclusive education focus on resource teachers in regular schools rather than whole general teachers (Li 2021). It results to the general teachers' knowledge and beliefs of inclusive education is not much lower than affection. Even though several policies had been issued to create inclusive environment in China, the professional development of teachers' abilities of inclusive education need to be systematic planning rather than local remediation. The government should reform the pre-service of teachers education (Feng and Wang 2020) and on-service training for all general teachers to make sure they are well-prepared for inclusive education.

There were positive association between inclusive school climate and their attitude towards inclusive education. The higher the inclusive school climate levels, the more positive teachers' attitudes are towards inclusion. It is similar with the work of several researchers (e.g. Hosford and O'Sullivan 2016). Establishing and maintaining a positive, inclusive social climate in school is essential for vulnerable

students. School climate is the contextual characteristics specific to schools which impact teacher's attitudes through a social process whereby individuals (i.e. teachers) evaluate a program, either favorably or unfavorably, through the subjective perceptions of the social system in which they are embedded, in this case the school (Gittelsohn *et al.* 2003, Rogers 2002). The inclusive school climate mainly contains school principal support to inclusive education and school practice activities of inclusion in China (Zhou 2019). Principals are very important in creating inclusive school climate in China since they are responsible for guiding the value of inclusive education, the investment of educational resources on inclusion, and administrative support for teachers, which could make teachers identify with the idea of inclusive education and develop positive attitude to it. Meanwhile, school practice activities, including school development plans for inclusive educational practices, preparation for teachers for inclusive education by professional development activities could make teachers familiar with it and well prepared (Wang *et al.* 2020). Thus, teachers' attitude toward inclusive education is associated with teachers' evaluation on the inclusive school climate.

Pearson correlation showed a positive correlation between teachers' efficacy and their attitude to inclusive education. The results are in line with findings from previous studies (Savolainen *et al.* 2012, Forlin *et al.* 2009, Sharma *et al.* 2009, Hofman and Kilimo 2014), which showed that teachers with higher efficacy showed more positive attitude to inclusive education. Based on self-efficacy theory (Bandura 1977), self-efficacy is an important motivational factor to stimulate and sustain human activities and behaviors. Individuals hold their beliefs about their own abilities, which is applied to predict their behaviors. Therefore, teachers are more receptive to inclusive education if they think they are able to implement it successfully (Zhang 2019). Teaching in inclusive classroom requires teachers to apply unique skills such as the ability to use assessment to promote learning and peer tutoring to adapt to students' different learning styles and abilities. The lack of inclusive teaching efficacy has a certain impact on teachers' attitude towards inclusive education (Zan *et al.* 2011, Freytag 2001).

Besides, the correlational results suggested a positive correlation between school climate and teachers' efficacy of inclusive education, which is in line with previous research. In the schools with more inclusive climate, school principals are supportive and encouraging, teachers would be more open to innovation and ready to adjust teaching methods to benefit all students (Wang *et al.* 2020, Ainscow 2000) since they obtain higher teachers' efficacy. Similarly, Hosford and O'Sullivan (2015) found teachers' perceptions of the school climate influenced their sense of teaching efficacy for inclusion. Teachers felt more efficacious in their ability to manage disruptive behavior, implement inclusive instruction, and engage in collaboration when they perceived supportive climate. Furthermore, positive perception of school climate gave teachers more opportunities to try challenging things and gain successful or mastery experience, which in turn raised teachers' sense of efficacy for inclusive practice (Collie *et al.* 2012, Tschannen-Moran and Hoy 2001).

The results showed that teachers' self-efficacy levels, as the mediator, partially mediate the relationship between teachers' perceptions of school climate and their attitudes towards inclusion. The mediation analysis was helpful to explore the internal mechanism of the relationship between school climate and teachers' attitude toward inclusive education. We found there was 34.97% influence contribution of school climate to teachers' attitude working through teachers' efficacy. It's consistent with the diffusion of innovations model. This model posits that a social system, which is in favor of a given innovation, will begin to modify and shape the salient attributes (e.g. efficacy) of those within it, with this leading to greater implementation of the innovation (Rogers 2002). According to Bandura (1977), there are four sources of efficacy beliefs under the efficacy theory framework: mastery experiences, vicarious experiences, social persuasion, and physiological and emotional states. School climate can work as social persuasion to improve teachers' efficacy, since the personnel in schools are required to implement inclusive activities. Therefore, in schools with positive inclusive climate, teachers would adjust their own beliefs and behaviors to meet the requirements of schools, and be promoted to learn the knowledge and skills of inclusive education, which improve their self-efficacy and form more positive attitude towards inclusive education. For teachers with higher perception of inclusive school climate, they would get more efficacy on inclusion and contribute to their persistence on the challenging work (Yulianti *et al.* 2018), which enhances their acceptance of inclusive education.

Limitations of the study

There are some limitations in the study. First, although the sample was cross regions, the uneven development of economy and inclusive education may influence the

general teachers' attitude. Future research could conduct a nationwide investigation to analyze the differences of demographic influence and teachers' characteristics in attitude to inclusive education in China, which could provide evidence for central government to make policies to improve the development of inclusive education for the whole country. Second, the cross-sectional research also limits the possibility to interpret the directionality of the relations. Longitudinal investigations on this topic will be useful in the further study.

Practical implication

Teachers, rather than policy-makers, shoulder the responsibility for the successful, committed implementation of this inclusive policy (Shevlin *et al.* 2008). Their attitude towards inclusive education is essential for the success of inclusion. The result found the positive association between school climate and teachers' attitude, including the teacher prosocial motivation, inclusive leadership and academic excellence that is government should promote the inclusive environment in schools beyond the physical settings. Teachers pay attention to the psychological inclusive environment. At the school level, more resources and collaborative structures should be provided to support teachers to carry out inclusive education.

Meanwhile, promoting teachers' efficacy to inclusive education is essential. According to Bandura (1977), individuals develop and shape their self-efficacy by interpreting, weighing and integrating information from four sources, namely, mastery experience, vicarious learning, social persuasion and physiological and affective states. The former two are about performance or experiences. The success of students' development in inclusive education can highly increase teachers' efficacy. Verbal persuasion is also the source of promote teachers' efficacy, which can be more effective if it's based on direct or alternative experiences. Combining those sources of teachers' efficacy, government and schools should intentionally publicize and summarize successful inclusive experiences and incorporate them into teacher training.

Besides, effects should be made to improve teachers' efficacy, especially in the dimension of efficacy in collaboration, that is, support from other professionals (such as physical therapists, speech therapists, occupational therapists). Their help is indispensable in the process of inclusion by helping to diagnose students with special needs and develop appropriate individualized education plans (Sun 2017). Besides, pre-service and in-service teachers in China are encouraged to learn strategies of inclusive setting to help them deal with challenging behaviors and differentiated instructions. It is exciting that inclusive education is included in the new major list of the catalogue of undergraduate majors in universities in China in 2021 (MOE 2021), which will help cultivating more high-quality inclusive education teachers.

Conflict of interest

The authors declare that they have no conflict of interest.

Ethical approval

Consent was obtained from all participants in the study. No official ethics approval number was provided since the ethic committee in our university was yet to be formed at the time of collecting data.

Funding

This research is funded by Grant No. 20YJC880015 from the Department of Social Sciences, Ministry of Education, People's Republic of China.

ORCID

Wangqian Fu  <http://orcid.org/0000-0002-6117-5547>

References

- Ainscow, M. 2000. The next step for special education. *British Journal of Special Education*, 27, 76–80.
- Alnahdi, G. 2020. Are we ready for inclusion? Teachers' perceived self-efficacy for inclusive education in Saudi Arabia. *International Journal of Disability, Development and Education*, 67, 182–193.
- Alquraini, T. A. 2012. Factors related to teachers' attitudes towards the inclusive education of students with severe intellectual disabilities in Riyadh, Saudi. *Journal of Research in Special Educational Needs*, 12, 170–182.
- Bandura, A. 1977. Self-efficacy: Towards a unifying theory of behavioral change. *Psychological Review*, 84, 191–215.
- Bender, W. N., Vail, C. O. and Scott, K. 1995. Teachers' attitudes toward increased mainstreaming: Implementing effective instruction for students with learning disabilities. *Journal of Learning Disabilities*, 28, 87–24.
- Bhatnagar, N. and Das, A. 2014. Attitudes of secondary school teachers towards inclusive education in New Delhi, India. *Journal of Research in Special Educational Needs*, 14, 255–263.
- Bornman, J. and Donohue, D. K. 2013. South African teachers' attitudes toward learners with barriers to learning: Attention-deficit and hyperactivity disorder and little or no functional speech. *International Journal of Disability, Development and Education*, 60, 85–104.
- Brown-Oyola, J. 2016. *The difference in attitudes of regular and special education teachers toward inclusion*. Doctor Dissertations. Walden University.
- Cattell, R. B. 1978. *The scientific use of factor analysis*. New York: Plenum.
- Central People's Government, 2017. *Special education promotion plan (2014-2016)*. Available at: <http://www.gov.cn/xinwen/2017-07/28/content_5214071.htm> [Accessed 19 August 2021].
- Chen, Y., Sun, Y., Shi, Y. and Du, Y. 2019. A survey of the situation and need of disabled students in inclusive schools in Beijing—from the perspective of the parents. *Chinese Special Education*, 26, 28–33+40.
- Collie, R. J., Shapka, J. D. and Perry, N. E. 2012. School climate and social-emotional learning: predicting teacher stress, job satisfaction, and teaching efficacy. *Journal of Educational Psychology*, 104, 1189–1204.
- De Boer, A., Pijl, S. J. and Minnaert, A. 2011. Regular primary school teachers' attitudes towards inclusive education: a review of the literature. *International Journal of Inclusive Education*, 15, 331–353.
- Deng, M. 2004. A comparative study on the attitude of teachers to inclusive education in urban and rural areas. *Education Research and Experiment*, 23, 61–66.
- Deng, M. and Zhao, H. 2019. Current situation and developmental tendency of inclusive education in China in the new era. *The Disability Research*, 9, 12–18.
- Du, L. and Fen, Q., H. 2019. A review of the progress of international inclusive education research and its enlightenment to China. *The Disability Research*, 33, 19–24.
- Emam, M. M. and Al-Mahdy, Y. F. H. 2020. Building school capacity for inclusive education in the sultanate of Oman: a construct validation of the inclusive school climate scale. *Leadership and Policy in Schools*, 1–16. doi:10.1080/15700763.2020.1770803
- Emam, M. M. and Mohamed, A. 2011. Preschool and primary school teachers' attitudes towards inclusive education in Egypt: the role of experience and self-efficacy. *Procedia - Social and Behavioral Sciences*, 29, 976–985.
- Erten, O. and Savage, R. S. 2012. Moving forward in inclusive education research. *International Journal of Inclusive Education*, 16, 221–233.
- Feng, Y. and Wang, 2020. Construction of inclusive education general curriculum for normal education majors – based on the practice-oriented model. *Science Education*, 36, 70–77.
- Fernandez, O., Patricia, A., Ramos, M., Silva, S., Nina, K. and Pontes, F. 2016. Overview of research on teacher self-efficacy in social cognitive perspective. *Anales de Psicología*, 32, 793.
- Forlin, C., Loreman, T., Sharma, U. and Earle, C. 2009. Demographic differences in changing pre-service teachers' attitudes, sentiments, and concerns about inclusive education. *International Journal of Inclusive Education*, 13, 195–209.
- Freytag, C. E. 2001. Teacher efficacy and inclusion: the impact of preservice experiences on beliefs. *Elementary Secondary Education*, 14, 1–16.
- Gittelsohn, J., Merkle, S., Story, M., Stone, E. J., Steckler, A., Noel, J., Davis, S., Martin, C. J. and Ethelbah, B. 2003. School climate and implementation of the pathways study. *Preventive Medicine*, 37, S97–S106.
- Gregory, J. L., & Noto, L. A. (2012). Technical manual for attitudes towards teaching all students (attas-mm) instrument. CEC, T ED Conference
- Haynes, R. B. 1993. Some problems in applying evidence in clinical practice. *Annals of the New York Academy of Sciences*, 703(1 Doing More Go), 210–225.
- He, Z. 2019. *Study on the realistic problems and promotion strategies of teachers' inclusive quality: taking Lanzhou a school as an example*. Master's Dissertation. Northwest Normal University.
- Hellmich, F., Löper, F. M. and Görel, G. 2019. The role of primary school teachers' attitudes and self-efficacy beliefs for everyday practices in inclusive classrooms – a study on the verification of the 'theory of planned behaviour'. *Journal of Research in Special Educational Needs*, 19, 36–48.
- Hofman, R. H. and Kilimo, J. S. 2014. Teachers' attitudes and self-efficacy towards inclusion of pupils with disabilities in Tanzanian schools. *Journal of Education and Training*, 1, 177–198.
- Hogan, A., McLellan, L. and Bauman, A. 2000. Health promotion needs of young people with disabilities: a population study. *Disability and Rehabilitation*, 22, 352–357.
- Holzbauer, J.J. 2004. Disability harassment of students in transition from school to work: implications for rehabilitation counseling. *Journal of Applied Rehabilitation Counseling*, 35, 3–7.
- Hosford, S. and O'Sullivan, S. 2015. A climate for self-efficacy: the relationship between school climate and teacher efficacy for inclusion. *International Journal of Inclusive Education*, 20, 1–18.
- Hosford, S. and O'Sullivan, S. 2016. A climate for self-efficacy: the relationship between school climate and teacher efficacy for inclusion. *International Journal of Inclusive Education*, 20, 604–621.
- Hoy, W. K. and Hannum, J. W. 1997. Middle school climate: an empirical assessment of organizational health and student achievement. *Educational Administration Quarterly*, 33, 290–311.
- Khochen-Bagshaw, M. 2020. Inclusive education development and challenges: Insights into the Middle East and North Africa region. *PROSPECTS*, 49, 153–167.
- Kurniawati, F., Minnaert, A., Mangunson, F. and Ahmed, W. 2012. Empirical study on primary school teachers' attitudes towards inclusive education in Jakarta. *Procedia - Social and Behavioral Sciences*, 69, 1430–1436.
- Lei, J., Luo, S. and Kang, F. 2017. The status and countermeasures of China's higher inclusive education. *The Disability Studies*, 7, 4–12.
- Li, X. 2016. Investigation and research on general primary school teachers' attitude towards on-class study: a case study of Fujian province. *Journal of Suihua University*, 37, 20–25.
- Li, X. 2021. Design and implementation of post-vocational training of inclusive education for teachers in general schools. *Modern Special Education*, 30, 20–25.
- Liu, C., Du, X. and Yao, J. 2000. Study on the acceptance attitudes of ordinary primary school teachers towards exceptional children. *Chinese Journal of Special Education*, 7, 34–36.

- Ma, H. and Tan, H. 2010. Survey on the current situation of teachers attending classes in Shanghai. *Chinese Journal of Special Education*, 17, 60–63.
- Mackinnon, D. P. and Fairchild, A. J. 2009. Current directions in mediation analysis. *Current Directions in Psychological Science*, 18, 16.
- MacKinnon, D. P., Fairchild, A. J. and Fritz, M. S. 2007. Mediation analysis. *Annual Review of Psychology*, 58, 593–614.
- Malinen, O. P., Savolainen, H. and Xu, J. 2012. Beijing in-service teachers' self-efficacy and attitudes towards inclusive education. *Teaching and Teacher Education*, 28, 526–534.
- Mamlin, N. 1999. Despite best intentions: when inclusion fails. *The Journal of Special Education*, 33, 36–49.
- Maxwell, A. 2016. *The composition and characteristics of teacher self-efficacy for inclusive practice*. Doctor Dissertation. University of Exeter.
- Mayrowetz, D. and Weinstein, C. S. 1999. Sources of leadership for inclusive education: creating schools for all children. *Educational Administration Quarterly*, 35, 423–449.
- McIlvaine, J. A. 2020. Inclusive education for autistic children: helping children and young people to learn and flourish in the classroom. *Journal of Autism and Developmental Disorders*, 50, 1454–1455.
- Messiou, K. 2017. Research in the field of inclusive education: time for a rethink? *International Journal of Inclusive Education*, 21, 146–159.
- Ministry of Education (MOE), 2020a. *Opinions on strengthening the work of students with disabilities learning in regular elementary schools*. Available at: <http://www.moe.gov.cn/jyb_xwfb/gzdt_gzdt/s5987/202006/t20200628_468749.html> [Accessed 18 August 2021].
- Ministry of Education (MOE), 2020b. *2019 statistical communique on the development of national education*. Available at: <http://www.moe.gov.cn/jyb_sjzl/sjzl_fztjgb/202005/t20200520_456751.html> [Accessed 10 January 2021].
- Ministry of Education (MOE), 2020c. *Reply to recommendation No. 6110 of the third session of the 13th National People's Congress*. Available at: http://www.moe.gov.cn/jyb_xxgk/xxgk_jyta/jyta_jijiaosi/202009/t20200921_489318.html [Accessed 19 August 2021].
- Ministry of Education (MOE), 2021. *Notice of the Ministry of Education on the announcement of the 2020 annual record and examination and approval results of undergraduate majors in regular institutions of higher education*. Available at: <http://www.moe.gov.cn/srcsite/A08/moe_1034/s4930/202103/t20210301_516076.html> [Accessed 10 February 2021].
- Morris, D. B., Usher, E. L. and Chen, J. A. 2017. Reconceptualizing the sources of teaching self-efficacy: a critical review of emerging literature. *Educational Psychology Review*, 29, 795–833.
- Pang, W. 2017. Research on the current situation and development of inclusion education for persons with disabilities. *The Disability Research*, 28, 35–43.
- Park, M.-H., Dimitrov, D. M., Das, A. and Gichuru, M. 2016. The teacher efficacy for inclusive practices (TEIP) scale: dimensionality and factor structure. *Journal of Research in Special Educational Needs*, 16, 2–12.
- Protheroe, N. 2008. Teacher efficacy: what is it and does it matter? *Principal*, 87, 42–45.
- Rogers, E. M. 2002. Diffusion of preventive innovations. *Addictive Behaviors*, 27, 989–993.
- Savolainen, H., Engelbrecht, P., Nel, M. and Malinen, O.-P. 2012. Understanding teachers' attitudes and self-efficacy in inclusive education: implications for pre-service and in-service teacher education. *European Journal of Special Needs Education*, 27, 51–68.
- Savolainen, H., Malinen, O. P. and Schwab, S. 2020. Teacher efficacy predicts teachers' attitudes towards inclusion—a longitudinal cross-lagged analysis. *International Journal of Inclusive Education*, 1–15. doi:10.1080/13603116.2020.1752826
- Schaefer, M., Pollex, T., Hanna, K., Tuorto, F., Meusburger, M., Helm, M. and Lyko, F. 2010. RNA methylation by Dnmt2 protects transfer RNAs against stress-induced cleavage. *Genes & Development*, 24, 1590–1595.
- Schulman, M. 2002. *Inclusive education of students with special needs in the California elementary schools: general education teachers' attitudes toward inclusive education*. Doctoral Dissertation. California State University, Long Beach.
- Schwab, S., Hellmich, F. and Görel, G. 2017. Self-efficacy of prospective Austrian and German primary school teachers regarding the implementation of inclusive education. *Journal of Research in Special Educational Needs*, 17, 205–217.
- Sharma, U., Loreman, T. and Forlin, C. I. 2012. Measuring teacher efficacy to implement inclusive practices. *Journal of Research in Special Educational Needs*, 12, 12–21.
- Sharma, U., Moore, D. W. and Sonawane, S. 2009. Attitudes and concerns of pre-service teachers regarding inclusion of students with disabilities into regular schools in Pune, India, Asia-Pacific. *Journal of Teacher Education*, 37, 319–331.
- Shevlin, M., Kenny, M. and Loxley, A. 2008. A time of transition: exploring special educational provision in the Republic of Ireland. *Journal of Research in Special Educational Needs*, 8, 141–152.
- Sheynin, M. 1990. *Attitudes of elementary school students and teachers towards exceptional individuals*. Unpublished Dissertation. School of Education, Haifa University (in Hebrew).
- Singh, S., Kumar, S. and Singh, R. 2020. A study of attitude of teachers towards inclusive education. *Shanlax International Journal of Education*, 9, 189–197.
- Soodak, L. C., Podell, D. M. and Lehman, L. R. 1998. Teacher, student, and school attributes as predictors of teachers' responses to inclusion. *The Journal of Special Education*, 31, 480–497.
- Sun, C. 2017. *Attitude of Chinese preschool teachers towards inclusion students with special need in relation to teacher self-efficacy and school climate*. Doctor Dissertation. University of the Pacific Stockton, California.
- Temberger, T. and Kiswarday, V. R. 2017. Attitude towards inclusive education: the perspective of Slovenian preschool and primary school teachers. *European Journal of Special Needs Education*, 33, 1–12.
- Thaver, T. and Lim, L. 2014. Attitudes of pre-service mainstream teachers in Singapore towards people with disabilities and inclusive education. *International Journal of Inclusive Education*, 18, 1038–1052.
- Tregaskis, C. 2000. Interviewing non-disabled people about their disability-related attitudes: seeking methodologies. *Disability & Society*, 15, 343–353.
- Tschannen-Moran, M. and Hoy, A. W. 2001. Teacher efficacy: capturing an elusive construct. *Teaching and Teacher Education*, 17, 783–805.
- UNESCO, 1994. *The Salamanca statement and framework for action on special needs education*. World Conference on Special Needs Education Access and Quality, Salamanca, Spain.
- Urton, K., Wilbert, J., Amp. and Hennemann, T. 2014. Attitudes towards inclusion and self-efficacy of principals and teachers in German primary schools. *Learning Disabilities: A Contemporary Journal*, 12, 151–168.
- Wang, Y., Fan, W., Zhang, W. and Zhou, D. 2020. The Influence of school integration atmosphere on teachers' integration education quality: the mediating role of teacher initiative. *Chinese Journal of Special Education*, 7, 15–21.
- Wei, Y., Chen, Q. and Huang, Y. 2017. Quality of inclusive education in China: status, problems and countermeasures. *Journal of Modern Special Education (Higher Education)*, 18, 9–14.
- Weisel, A. and Dror, O. 2006. School climate, sense of efficacy and Israeli teachers' attitudes toward inclusion of students with special needs. *Education, Citizenship and Social Justice*, 1, 157–174.
- Wertheim, C. and Leyser, Y. 2002. Efficacy beliefs, background variables, and differentiated instruction of Israeli prospective teachers. *The Journal of Educational Research*, 96, 54–63.
- Wilson, C., Marks Woolfson, L. and Durkin, K. 2020. School environment and mastery experience as predictors of teachers' self-efficacy beliefs towards inclusive teaching. *International Journal of Inclusive Education*, 24, 218–234.
- Yulianti, P., Atomzeal, M. O. and Arina, N. A. 2018. Burnout, self-efficacy and work satisfaction among special education teacher. *KnE Social Sciences*, 3, 1180–1191.
- Zan, F., Liu, C. and Wang, M. 2011. On the investigation into in-service teachers' self-efficacy in inclusive education in Shanghai. *Chinese Journal of Special Education (Monthly) 5th Issue*, 131, 4–9.
- Zeng, Y. R. 2007. Study on the attitudes, teaching strategies and support required of ordinary primary school teachers in attending classes. *Chinese Journal of Special Education*, 14, 3–7.
- Zhang, Y. 2019. *The relationship between teachers' efficacy in implementing inclusive education and their attitudes towards inclusive education*. Shenyang: Shenyang Normal University.
- Zhao, H. and Xu, L. 2018. Investigation on attitudes of preschool education workers towards special children under the background of integrated education. *Journal of Teacher Education*, 30, 32–40.
- Zhou, D. 2019. *Study on the mechanism of motivation structure and related factors of inclusive teachers' agency*. Doctor Dissertation. Beijing Normal University.
- Zhu, N., Zhao, X. and Liu, Y. 2009. A case study on school climate in a primary school with special children learning in regular classes. *Chinese Journal of Special Education*, 105, 24–28.