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ORIGINAL ARTICLE

Moderating effect of the urbanicity construct on teachers' capacities to foster children's creativity in rural areas: evidence from Southwest China

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Abstract
While the Chinese government is in full force to narrow the gap between its rural and urban areas in all facets of development, it has been suggested that there are disparities in teacher quality in the two dichotomous territories, especially in terms of promoting children's cognitive trajectory. To unpack specifically the differences of the two groups of teachers' capacities to foster children's creativity, this study investigated the impact, namely the moderating effect, of the urbanicity construct (i.e., in terms of the extent of urbanization of the teachers' living and working environment) on the relationship between teachers' perceived creativity characteristics of children and teachers' intention of creativity fostering teaching. Such was done through comparing the teachers' perception of creative characteristics (teachers' CC), vis-à-vis teachers' intention of creativity fostering teaching (teachers' CFT intention). In total, 104 teachers from two parts of Guizhou province participated in the study. Results showed that teachers' CC positively associated with CFT intention. However, urbanicity did not directly associate with teachers' CC and CFT. Instead, higher urbanicity decreased the association between teachers' CC and CFT intention. Implications and the significance of these findings will be discussed.

Keywords Urbanicity · Creative fostering teaching · Rural education · Teacher education

1 Introduction

Despite China's rapid economic growth, the huge disparity in finance and modernization between its urban and rural areas, termed the "urban–rural dual economic structure" (城鄉二元經濟結構), persists (Chan & Wei, 2019; Lewis, 1954). In this structure, urban areas have developed modern infrastructure and municipal functionality. People living in urban areas enjoy quality education, transportation, communication networks, and medical resources, etc. However, people in rural areas either lack those supporting facilities or those facilities lack the same level of quality, although urbanization process is narrowing

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this disparity. Under this structure, urban areas represent well-developed areas, but rural areas represent under-developed areas. Urbanicity, as a result of urbanization process (Dahly & Adair, 2007; Stamm, 2003; Vlahov & Galea, 2002), shows that the "urban–rural dual economic structure" still exists.

It has long been recognized that one of the biggest roadblocks to the development of rural areas in China is education, specifically the high turnover rate (Liu, 2012) and the low quality of teachers (Hallinger & Liu, 2016; Hu, Roberts, Ieong, & Guo, 2015; Ye, 2009). For example, teachers have low qualification or mismatch qualification (i.e., many teachers were transferred from secondary schools to work in lower grades such as primary schools and even kindergartens because of staff redundancy in secondary schools) and poor training credentials. Since there is no or poor job attraction in rural schools, the turnover rate of teachers is high and the unequal distribution of quality teachers which challenges the notion of education equity has persisted (Hallinger & Liu, 2016; Hu, et al, 2015; Wang, 2011; Wang & Gao, 2013; Ye, 2009). The Chinese Ministry of Education attempted to solve the problem by designing a Fee-Free Teacher Education (FFTE) program in 2007 (Ministry of Education, 2007), which aimed to cultivate quality teachers directly for rural schools. Recent policies pertaining to rural areas advocate precise action plans to advance the quality of teachers in under-developed rural areas of China, such as *The Village Teachers Supporting Plan (2015–2020)*[1]*(*鄉村教師支持計劃*)*, which focuses on supporting village teachers' professional development. Nonetheless, because of the constraints of rural living environment, graduates from the above-mentioned programs still resist long-term service in rural schools (Wang & Gao, 2013). Such constraints, in comparison with urban cities, include: (a) lower quality of life and working conditions (Ji & Qiu, 2019; Hu et al., 2015), (b) training programs are irrelevant to rural school environment and conditions (Wang, 2011), as well as (c) fewer opportunities for improving professional skills and promotion (Qin & Zeng, 2018). Meanwhile, the different living and working conditions in urban and rural areas might influence teachers' perceived beliefs in fostering children's development. One of children's developmental aspects, which has drawn educators' attention for over several decades, is children's manifestation of creativity and the means to promote such an ability in young children (e.g., Cropley, 1997; Soh, 2017). Yet, creativity is contingent to environmental conditions such as the learning environment. The unsatisfactory teacher quality and learning environment in rural areas, as mentioned above, will jeopardize the quality of education that children in rural areas receive, as well as post challenges on whether those children's creativity can be promoted to meet the challenges of the twenty-first century. The divide between urban and rural children's creativity level will eventually accentuate the dichotomy of economic and developmental performances of the urban and rural areas, which can lead to the recurrence of the "urban–rural dual economic structure" (Chan & Wei, 2019; Lewis, 1954) that has kept poor rural areas in disadvantageous circumstances.

The studies of creativity have received extensive attention from educational researchers, from creative person's characteristics (e.g., Sternberg & Lubart, 1991) to the way of thinking (e.g., Runco, 2010), and the environment variables that associate creativity development (e.g., Cayirdag, 2017). Teachers, as significant others in children's lives, play an important role in fostering children's creativity (Aiken, 1973; Beghetto, 2006; Woodman,

[1] PRC. The State Council. (2015, June). The State Council announcement of village teachers supporting plan in 2015-2020 (in Chinese). The State Council, no.43, Retrieved June, 8, 2015, from http://www.gov.cn/zhengce/content/2015-06/08/content_9833.htm.

et al., 1993). In various Chinese societies, studies on fostering creativity involved teachers in Macau (Vong, 2008; Mak, Vong, Lu, & Leung, 2020), Hong Kong (Chan & Yuen, 2014; Chien & Hui, 2010), Shanghai and Taiwan (Chien & Hui, 2010), and Jiangsu province (Yi et al., 2013). Though these studies mentioned the importance of a supportive school environment and local context for creativity, they also pointed out that teachers' conceptions about creativity may vary because of diverse geographical and social contexts of China (Chien & Hui, 2010). Furthermore, these studies in China and across the straits have focused on teachers' views in economically developed areas. While the Chinese government is endeavoring to narrow the gaps between its rural and urban areas, quality in education included, to unpack the special features in teachers' perceptions of creativity and their creative teaching intentions or behaviors in their respective regions (i.e., either rural or urban) is imminent. Considering the unfavorable circumstances, teachers in rural areas may encounter greater difficulties to conduct creative fostering teaching strategies than urban teachers. Hence, rural teachers may have less intention of creative fostering teaching. The focus of this article is to take a comparative perspective and to scrutinize the disparity, if any, of urban and rural teachers' effort to promoting young children's creativity, especially in terms of teachers' perception of children's creative characteristics (teachers' CC) and their intention of creativity fostering teaching (teachers' CFT).

Promoting creativity in children through education in China has been called upon for the past decade (e.g., Hu, et al., 2013; Yi et al., 2015). If we were to reveal and exemplify the urban–rural issues relating to the promotion of creative education in China, it is essential to focus on studying the teachers. This article is based on data from a larger research project that aims to examine the discrepancy in terms of children's creativity and factors influencing the promotion of creativity in southwest China. In this article, we aim to examine the specific relationship between teachers' perception of creativity and their CFT intention, as well as how teachers living in urban or rural areas at a given time are associated with CFT intention. We anticipate that the findings will indicate empirically the various effects underlying the relationship of teachers' perception of creative characteristics (teachers' CC) and pedagogical strategies they intended to take (teachers' CFT) between urban (those living in urban at a given time) and rural teachers (those live in rural at the same given time). Such empirical evidence would call on teacher trainers and educational policy makers, in China and in countries with similar educational concerns, to consider quality discrepancies in teaching, and more broadly in education, in terms of the socio-structural conditions faced by certain teachers.

2 Literature review

2.1 Creative fostering teaching (CFT) and teachers' attitudes

Puryear et al. (2017) argued that creativity serves more as a way of ideation or production in education spaces. It is the interaction among disposition, process, and environment of individuals or groups. Through this interaction, people can produce perceptible product that is both novel and useful as defined within a social context. According to Soh (2000), creative fostering teaching is teachers' creative fostering behaviors through teacher–student interactions, which could directly reinforce students' creative efforts and outcomes, as well as indirectly provide a creativity supportive environment. Teachers play an important role in cultivating children's creativity (Aiken, 1973; Beghetto, 2006), and teachers'

behaviors are considered to be an important component in fostering children's creativity (Horng et al., 2005; Runco & Johnson, 2002; Soh, 2000; Tan & Majid, 2011; Woodman et al., 1993). Horng et al. (2005) investigated three award-winning teachers who practiced student-centered learning, had good classroom management, encouraged children's creative thinking, and linked lessons to real life. These studies showed that teachers' attitude toward creativity influences their strategies of teaching. The studies of creative fostering teaching (or CFT) behaviors originated from Whitlock and DuCette (1989)'s work and later extended by scholars such as Soh (2000, 2015). These works reiterated that desirable teaching behaviors are beneficial for students' creativity. However, teachers' intention to engage themselves in CFT may be influenced by their personal (e.g., perception of creativity) and environmental (e.g., support from school and community) factors (Chan & Yuen, 2014). For example, Chien and Hui (2010) reported that teachers' understanding of creativity in different regions may vary. This line of research implies that there could be differences in teachers' understanding about creativity, thus affecting their CFT intention.

2.2 Teachers' perception of creative characteristics (CC)

To enhance teachers' CFT, one important issue is to understand what is meant by creativity from teachers' perspective. Beghetto (2006) stated that teacher beliefs or conceptions about creativity have a major influence on pedagogical activities and instructional behaviors used in the classroom. Studies have confirmed that children's creativity is largely dependent upon their teacher's understanding of creative characteristics (CC) (Andiliou & Murphy, 2010; Beghetto, 2006). Teachers will typically identify behavioral traits that reflect creative characteristics (Fryer & Collings, 1991; Hong & Kang, 2010; Jahnke et al., 2017; Tan, 2000). Some of the important creative characteristics identified by teachers were *imagination*, *originality*, and *self-expression* (Fryer & Collings, 1991). Notwithstanding, Hong and Kang (2010) found that for South Korean teachers, *innovative* and *problem-solving skills* were the notable core traits, implying there could be rather obvious differences in teachers' understanding of a given yet elusive concept such as creativity.

2.3 Teachers' perception of CC is shaped by national culture

Although creative personality characteristics are by and large understood from a western perspective, cultural and socio-context differences should be taken into account (Hui & Rudowicz, 1997; Lubart, 1999; Niu & Sternberg, 2002, 2006; Riquelme, 2002; Zhou et al., 2013). According to Niu and Sternberg (2002, 2006), both ancient Chinese and western conceptions of creativity contain the notion of goodness. Both cultures believe that creativity comes from a source outside human beings. Westerners believed that the so-called humans creation does not exist; humans imitate God's creation. Chinese connected human creativity to a free mind through meditation (Taoist ideas) or self-cultivation (Confucius ideas). Ancient western creativity emphasized novelty (from nothing). But ancient eastern creativity focused on its everlasting changes. The western beliefs of creativity from ancient to modern times are novelty. However, the Chinese beliefs of creativity from ancient to modern times are moral goodness and contribution to society. The key difference between west and east cultural values is the extent of independence of the individual from others. With influences of western conception of creativity, the modern Chinese understanding of creativity shares some western features of creativity such as novelty and individualism.

However, even under similar cultural background, e.g., the Confucius culture, people's perception of creativity may vary (e.g., Hong & Kang, 2010). There are socio-contextual differences in peoples' conception of creative characteristics even within societies that highly share the Chinese culture (Mak, Vong, Lu, & Leung, 2020). Therefore, it is likely that the Chinese national culture can influence Chinese teachers' perceptions of children's creative characteristics and then shaped their ideas and ways of teaching. When studying teachers' perception of creativity, the cultural background and socio-contexts that teachers live in should be considered.

2.4 Teachers' perception of CC relies on subject-specific experiences

Teachers' perception of creative characteristics is different from researchers' and depends on the educational space in which the teachers work, thus subjecting themselves to certain beliefs (Mullet et al., 2016). Aljughaiman and Mowrer-Reynolds (2005) studied 48 elementary school teachers and found that teachers only recognized likeable characteristics and high achievement student's creative characteristics but ignore students who presented negative behaviors and low achievement. Some scholars noted that teachers who have vague ideas about creativity are *less likely to foster* children's creative ability during the teaching process (Beswick, 2004; Newton & Beverton, 2012). Yet, how creative characteristics are understood by teachers from very different socio-economical areas, such as those from under-developed rural areas and those from privileged urban areas within the same nation require further investigation. From the above two aspects, teachers' perception of creative characteristics (CC) stems from their subject-specific experiences under a specific national culture and social contexts.

To summarize, teachers play an important role in children's creativity, and their instructional strategies are crucial to fostering children's creativity (Horng et al., 2005; Murdock & Keller-Mathers, 2008). However, the current literature on teachers' CFT focuses only on how teachers with high qualifications teach creativity in the classroom (Cheng, 2010; Hartley & Plucker, 2014; Vong, 2008, 2013); how teachers' CFT intention is related to teachers' CC is yet to be investigated. Moreover, the afore-mentioned studies are largely from a western views of creative characteristics, which might not be shared by teachers with low qualification and from rural contexts who have limited access to resources and training based on western theories on educational ideas such as creativity.

2.5 Urbanicity on CC and CFT in the Chinese context

In terms of the environment factors of creativity, the living environment could be one of them. Urbanization is the progress of urban settings under the living environment concept, which may have included growing population size and density, active economic activity and markets (traditional and modern), advance transportation and communication, high-quality education, and functional system for health services and social services (Dahly & Adair, 2007; Jones-Smith & Popkin, 2010; Vlahov & Galea, 2002). Urbanicity has been viewed as the result of urbanization, i.e., the nature of urban environments that present the urban features (Vlahov & Galea, 2002). Urbanicity has been positively associated with people's nutrition (Sun, et al., 2021; Wu, et al., 2017), influenced people's cognition health (Johnson, et al., 2020) and perceptual bias (Caparos, et al., 2020). Therefore, where people live and work may affect their perceptions and behaviors and the urbanicity construct can

well be applied to help understanding teachers' perception as being shaped by their living and working environment.

2.6 Impact of "low quality" of rural teachers and teaching of creativity

Recent research suggests that the promotion of children's creativity is a crucial component in early childhood education in China (Ministry of Education, 2010; Vong, 2013). To understand the effects of creativity in education, new teaching approaches to foster children's creativity were researched (Cheng, 2010; Hartley & Plucker, 2014; Zhang & Wang, 2011). However, these studies on teachers' role to fostering children's creativity mainly concentrate in urban areas, while research on rural areas has been neglected. According to Karlidag-Dennis, Hazenberg and Dinh (2020)'s study, compared to urban areas, teachers who lived in rural areas faced multiple challenges and barriers in their career. Rural teachers lacked updated resources, common language with students or parents, and attention to the contextual or cultural factors of students' communities. Similar dilemmas were found in Chinese rural areas. The imbalance of economic development in China has caused great rural–urban inequality in terms of educational resources (Hu et al., 2014; Ye, 2009), teacher qualification and training (Yang, et al., 2014), and commonly held educational values (Yu, et al., 2011). For example, compared to urban teachers, many rural teachers still rely on the traditional teacher-directed teaching methods, and children are given very few opportunities to participate in creative teaching and learning activities, which are desirable for creativity to thrive (Zhang & Wang, 2011). Therefore, teachers' living and working environment resulted from rural–urban inequality likely varies. Such difference will in turn influence the relationship between teachers' CC and CFT, which also calls for further research. Moreover, adverse factors such as less engaged in learning on the job (Hallinger & Liu, 2016), seeing the most outstanding teachers moved to urban areas (Ye, 2009), less financial support on teachers' professional training (Hu, et al., 2015), can hardly lead teachers in rural areas to reach the same quality as those in urban areas. Rural teachers, including kindergarten and primary school teachers, might hamper the prospects of promoting creativity in rural students.

According to officials in China (CPC Central Committee, 2018), promoting the quality of teachers is one of the major objectives of kindergarten education in China. However, the inequality of teacher resources is still a major concern (Ji & Qiu, 2019; Yang et al., 2014; Wen & Gu, 2017). For example, Wen and Gu (2017) observed that rural teachers have few opportunities to participate in professional training compared to urban teachers; most teachers with college degrees are more likely to work in cities than in rural areas. Due to the educational discrepancies between urban and rural China, it is noteworthy that urbanicity, which represents teachers' working and living environment, may influence the effect of teachers' perception of CC on their CFT intention.

2.7 Scope of this study

This study aims to examine the impact, namely moderating role, of urbanicity on the relationship between teachers' CC and CFT intention (see Fig. 1). Methodologically, it might contribute to existing research in providing empirical evidence through examining the moderation effects in order to tap into whether urbanicity influences teachers' CFT intention. Moreover, the notion of urbanicity that bears upon teachers' conception of creativity and pedagogies based on CC and CFT can provide educational policy makers in China and

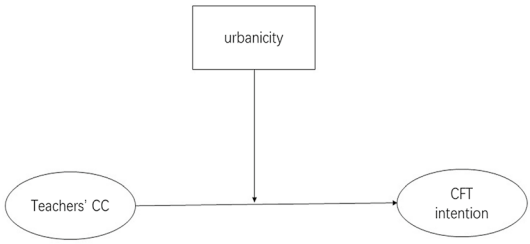

Fig. 1 The proposed model of teachers' CC effect on CFT intention, moderated by urbanicity

elsewhere, with evidence to reduce, with greater precision, the discrepancy in education development between urban and rural areas. Hence, the research questions are as follows:

RQ1: What is the relationship between teachers' CC and their CFT intention in the context of urbanicity?
RQ2: How does urbanicity affect the relationship between teachers' CC and teachers' CFT intention?

Moreover, it has been well documented that in the Chinese educational and cultural context, the importance of examination could be traced back to the Sui Dynasty in A.D. 603, where people with higher familiarity with the Confucian literature in the imperial examinations would have higher bureaucracy positions (Wu, 2016). But in Chinese societies nowadays, examination is still the predominant means to measure students' academic success such as the National College Entrance Examination (高考) in China. Examination scores are used to distinguish the academically "successful" students from the "unsuccessful" ones and direct them toward different academic tracks and future careers, respectively, which could in general shape their social status in the future (Yan, 2015). This highly examination-oriented educational culture has caused teachers to shoulder great pressure in covering all the teaching materials in an academic-focused curriculum within a scholastic year (Chan & Yuen, 2014). Consequently, teachers focus on transmitting knowledge to students rather than fostering their creativity or other generic skills. As a result, teachers tend to be more reluctant to innovate (Chan & Yuen, 2014; Li & Li, 2019). Considering the above assessment phenomenon in China, it is possible that Chinese teachers in China continue to neglect the creative aspects in education, both in their understanding and teaching strategies. Hence, we added question three to this study:

RQ3: Are urban teachers' CC and CFT different from rural teachers' CC and CFT?

3 Method

3.1 Participants

Participants were 104 kindergarten and primary school grade 1 and 2 teachers in Guizhou province in China and were teachers-in-charge in all classes. There were, respectively, 64 teachers from provincial urban city Guiyang and 40 from rural villages of the Qiandongnan Prefecture in southwest China. All kindergartens and primary schools are public institutions which are to certain extents supervised by the local education committees. As teachers-in-charge, respondents taught subject(s) and were the primary tutors of

Table 1 Demographic Information of Guizhou Teachers

	Urban		Rural		Total	
	N	%	*N*	%	*N*	%
No. of teachers	64	61.5	40	38.5	104	100
Gender						
Male	0	0	5	12.5	5	4.8
Female	64	100	35	87.5	99	95.2
Teaching years						
Equal or less than 1 year	2	3.1	0	0	2	2
1.01–9 years	38	59.4	26	65	64	61.5
Above 9 years	17	26.6	14	35	31	29.8
Blank	7	10.9	0	0	7	6.7
Education level						
High school diploma	2	3.1	4	10	6	5.8
Certificate	38	59.4	22	55	60	57.7
Bachelor	23	35.9	13	32.5	36	34.6
Blank	1	1.6	1	2.5	2	1.9

pupils. Demographic background is presented in Table 1. Chi-squared tests showed that two groups of teachers were similar in all demographic variables ($p > 0.05$). Consent forms were presented to the schools and teachers before they joined the study. The purpose of the study was explained both in written and verbal forms, and all participants knew that their participation was on a voluntary and anonymous basis.

3.2 Measurements

3.2.1 Urbanicity

Theoretically, urbanicity represents the impact of living and working environment in urban areas at a given time (Vlahov & Galea, 2002), and the different levels of infrastructure and municipal functionality. Technically, we used a dummy variable and coded teachers in the rural areas as "1" and urban areas as "2," depending on whether schools are located in rural or urban areas. Hence, urbanicity here refers to some kind of modern features and resources where urban schools probably get more. We will return to this in the discussion section.

3.2.2 Teachers' perception of creative characteristics (Teachers' CC)

Teachers' perception of creative characteristics was measured by the Performing Creative Characteristics Scale (PCCS) (Mak, et. al., 2020). This scale measures the perception of creative characteristics held by Chinese teachers (of 4–8-year-old children) in different Chinese areas with different social economic status. The similarity and difference on the nature of creative characteristics shared by Chinese teachers from the same culture have also been considered. These creative characteristics followed a descending continuum pattern of Western, Hong Kong, Macau, and Chinese domains. The Western and Hong Kong domains were more related to children's creativity in terms of TCAM (a measurement

of children's creativity with western educational ideas of creativity), while Chinese and Macau domains were less. Participants were asked to score the items that best represents to what extent they think a creative child (of similar age as their pupils) should possess the characteristic. The reliability of Cronbach's alpha for Chinese, Macau, Hong Kong, and Western domains in this study was 0.735, 0.861, 0.937, and 0.905, respectively, all greater than 0.7 with satisfactory reliabilities.

3.2.3 Intention of creative fostering teaching (CFT intention)

The teachers' CFT intention was measured by Soh (2000, 2015)'s self-rating Creative Fostering Teaching Behaviour Index (CFT Index) with nine domains (*Independence, Integration, Motivation, Judgement, Flexibility, Evaluation, Question, Opportunity, and Frustration*). This scale measures teacher behaviors that are relevant to children's creativity (Cropley, 1997). Items were rated on an 11-point Likert scale from 0 (Never) to 10 (Always), a continuous scale forming a natural continuum for most people, and closer to normality (Leung, 2011). Sample items for each domains were:

"I leave questions for students to find out for themselves" in *Dependence*;
"Students in my class have opportunities to do group work regularly" in *Integration*;
"I emphasize the importance of mastering the essential knowledge and skills" in *Motivation*;
"I comment on students' ideas only after they have been more thoroughly explored" in *Judgment*;
"I encourage my students to ask questions freely even if they appear irrelevant" in *Flexibility*;
"I provide opportunities for my students to share their strong and weak points with the class" in *Evaluation*;
"When my students have questions to ask, I listen to them carefully" in *Question*;
"When my students put what they have learnt into different uses, I appreciate them" in *Opportunity*; and
"I help students who experienced failure to cope with it so that they regain their confidence" in *Frustration*.

The self-reporting of CFT scale represents teachers' willingness to fostering children's creative characteristics. Cronbach's alphas of all nine domains were all above 0.70, and scales were reliable.

3.3 Data analysis

We used correlational analysis to show the relationships between urbanicity and teachers' CC/CFT intention, as well as between teachers' CCs and CFT intention. We supplement correlational analysis by effect sizes (Cohen, 1992), with effects interpreted as small, medium, and large for magnitude of correlations around 0.1, 0.3, and 0.5, respectively. Statistical moderation analysis was conducted to show the moderation effect of urbanicity on teachers' CCs and CFT intention. Structural equation modeling (SEM) was conducted with Mplus 7.0, with teachers' CC (four domains) as independent variable (x), teachers' CFT (nine domains) intention as dependent variable (y), and urbanicity (rural vs. urban) as moderators (w). This can investigate whether urbanicity has any moderation effects on

Table 2 Correlations among Urbanicity, Teachers' CC and CFT Intention

Variable	Chinese	Macau	Hong Kong	Western	Urbanicity
Independence	.718***	.513***	.539***	.453***	.108
Integration	.672***	.510***	.501***	.452***	.071
Motivation	.524***	.426***	.383**	.311*	.098
Judgement	.640***	.467***	.465***	.418***	.138
Flexibility	.730***	.560***	.592***	.533***	.138
Evaluation	.697***	.492***	.484***	.422***	.125
Question	.722***	.594***	.583***	.539***	.106
Opportunity	.701***	.539***	.528***	.447***	.103
Frustration	.769***	.511***	.502***	.451***	.051
Urbanicity	−.137	−.075	−.175	−.135	

***$p < .001$. **$p < .01$. *$p < .05$

the relationship between teachers' CC and CFT intention. Bootstrapping is used here and hence results will still be robust even though normality is not assumed (Preacher, et al., 2007).

4 Results

4.1 Correlations among urbanicity, teachers' CC, and CFT intention

To answer RQ1 and RQ3, Pearson's correlation was conducted to analyze the correlation among teachers' CC, urbanicity, and CFT intention. Results showed significant positive correlations between all four domains of teachers' CC and all nine domains of CFT intention, rs = 0.311 to 0.769 (ps < 0.05). In terms of effect sizes, all correlations were medium or large. However, no significant correlations were found between urbanicity and nine domains of CFT intention, rs = 0.051 to 0.138 (0.204 < ps < 0.630), as well as between urbanicity and four domains of teachers' CC, *r*s = − 0.175 to − 0.075 (0.091 < ps < 0.483) (see Table 2).

4.2 The moderation effect of urbanicity on teachers' CC and teachers' CFT intention

To answer RQ2, we conducted moderation analysis. For moderation analysis, an interaction term was created in the moderation analysis, to explore the effects of urbanicity (teachers' living and working environment) on the relationship between teachers' CC and CFT intention. Since there are four and nine domains, respectively, for CCs and CFTs, there are 36 possible combinations and models in total. For moderation analysis, we used the significances of the coefficients of the interaction terms created by urbanicity and all CCs (i.e., urbanicity*CCs) toward CFTs as indicators of moderation effects. Results indicated that there were 21 out of 36 models that are statistically significant, and they are reported in Table 3 below.

From Table 3, the Chinese domain has significant results with all nine CFT domains, and the standardized coefficients ranged from − 0.294 to − 0.625. The results were

Table 3 Moderation effects of urbanicity toward the relationship between CC and CFT

CC	CFT	β_x	β_m	β_{x*m}	95% CI for X*M	
					LL	UL
Chinese	Independence	0.658***	0.166	− 0.294	− 0.117	− 0.035
	Integration	0.604***	0.143	− 0.32	− 0.612	− 0.028
	Motivation	0.361**	0.26	− 0.542	− 0.880	− 0.203
	Judgement	0.504***	0.242	− 0.459	− 0.811	− 0.108
	Flexibility	0.493***	0.310*	− 0.625	− 0.874	− 0.376
	Evaluation	0.53***	0.235	− 0.51	− 0.858	− 0.162
	question	0.637***	0.17	− 0.351	− 0.664	− 0.038
	Opportunity	0.537***	0.311*	− 0.474	− 0.741	− 0.207
	Frustration	0.663***	0.193	− 0.403	− 0.639	− 0.167
Macau	Motivation	0.313*	0.243	− 0.517	− 0.856	− 0.178
	Flexibility	0.462***	0.286	− 0.44	− 0.743	− 0.138
	Question	0.534***	0.189	− 0.37	− 0.710	− 0.029
	Opportunity	0.454***	0.272	− 0.359	− 0.607	− 0.110
	Frustration	0.458***	0.161	− 0.292	− 0.534	− 0.050
Hong Kong	Motivation	0.278*	0.279	− 0.441	− 0.770	− 0.111
	Flexibility	0.486***	0.326*	− 0.405	− 0.674	− 0.137
	Evaluation	0.634***	0.3	− 0.519	− 0.658	− 0.014
	Question	0.54***	0.171	− 0.261	− 0.566	− 0.005
	Opportunity	0.44***	0.296	− 0.331	− 0.631	− 0.102
	Frustration	0.441***	0.182	− 0.275	− 0.506	− 0.043
Western	Motivation	0.222	0.232	− 0.337	− 0.667	− 0.061
	Flexibility	0.453***	0.255	− 0.317	− 0.592	− 0.042
	Opportunity	0.367***	0.23	− 0.267	− 0.514	− 0.020

* refers to p-value <.05; ** refers to p-value <.01; *** refers to p-value <.001

significant with the point zero excluded in all nine CIs [lower CIs from − 0.880 to − 0.117; upper CIs from − 376 to − 0.028].

The interaction term between Macau domain of CC and urbanicity was significant for CFT intention in motivation domain with standardized coefficients β_{x*m} = − 0.517, CI [− 0.856, − 0.178], flexibility domain, β_{x*m} = − 0.440, CI [− 0.754, − 0.138], question domain, β_{x*m} = − 0.370, CI [− 0.710, − 0.029], opportunity domain, β_{x*m} = − 0.359, CI [− 0.607, − 0.110], and frustration domain, β_{x*m} = − 0.292, CI [− 0.534, − 0.050].

For the Hong Kong*urbanicity interaction, there were six significant results for CFT intention, motivation domain, β_{x*m} = − 0.441, CI [− 0.770, − 0.111], flexibility domain, β_{x*m} = − 0.405, CI [− 0.674, − 0.137], evaluation domain, β_{x*m} = − 0.519, CI [− 0.658, − 0.014], question domain, β_{x*m} = − 0.261, CI [− 0.566, − 0.005], opportunity domain, β_{x*m} = − 0.331, CI [− 0.631, − 0.102], and frustration domains, β_{x*m} = − 0.275, CI [− 0.506, − 0.043].

And the interaction term between Western domain of CC and urbanicity was significant for CFT intention in motivation, β_{x*m} = − 0.337, CI [− 0.667, − 0.061], flexibility, β_{x*m} = − 0.317, CI [− 0.592, − 0.042], and opportunity domains, β_{x*m} = -− 0.267, CI [− 0.514, − 0.020] (see Table 3).

From Table 2 the simple correlations between CCs and CFTs, and also from Table 3 the β_x coefficients between the same two variables, CCs has generally positive effects toward CFTs, disregarding the effects of urbanicity. However, the effects from CCs toward CFTs are likely to be lower in urban than in rural areas. In the other words, the effects of CCs in affecting CFTs are higher in rural than those in urban areas. In rural areas, if teachers' creative characteristics are high, its effects on creative fostering teaching will be greater than those in the urban areas.

5 Discussion

5.1 Positive association between teachers' CC and CFT intention

The current study has two major contributions. First, we attempt to explore the relationship between teachers' conception of CC and their CFT intention. Correlational analysis showed that teachers' CC was positively related to teachers' CFT intention, suggesting that teachers who rate teachers' CC higher tend to show higher eagerness for creative fostering teaching in daily teachings, indicating higher CFT intention. This aligns with Beghetto's (2006) finding that teachers' perception of what makes a creative person influences their teaching behaviors. However, such result does not agree with previous research which pointed to the Chinese teachers' compliance with the highly examination-oriented educational culture and primarily focus on knowledge transmission, neglect creativity fostering in their teaching, and are reluctant to renovate (Chan & Yuen, 2014; Li & Li, 2019). This result is perplexing, but it might reflect that, under the government's initiative in improving the quality of education in rural areas and the provision of teacher training programs, the importance of fostering children's generic skills and creativity is gradually getting across to teachers. However, we are cautious about this result as it requires further confirmation by future studies. Besides, in terms of effect size, there was a pattern that teachers' CC on Chinese domain was more related to CFT intention, followed by Macau and Hong Kong domains, and Western domain was less related to CFT intention. There are two possible explanations of why a continuum pattern of teachers reports Chinese interpretation of CC is more associated with their CFT intention than Western domain of CC. There are two aspects which may explain this result.

Chinese philosophy emphasized that creativity is a process of self-cultivation/learning and contributing to social values (Niu et al., 2006). Teachers who live under Chinese context would find it hard, if not problematic, to perceive creativity to be independent from creative characteristics that are related to self-cultivation, learning process, and making contribution to society. This finding is in line with Mullet et al. (2016)'s review that different cultures have their own conception of creative characteristics and behaviors.

When teachers have weaker perception of creative characteristics, they also reported lower CFT intention in their daily activities. According to Mullet et al. (2016)'s review, teachers conception of creativity and creative behaviors is different from researchers. On teachers' perspectives, teachers are willing to identify "teacher-friendly" creative characteristics (e.g., energetic, playful) but present some of "researcher-friendly" creative characteristics as misbehaviors (e.g., day-dreaming).

Similar results were found by Beswick (2004) and Newton and Beverton (2012), which reported that teachers who have vague ideas of creative characteristics are less likely to

foster children's creative ability during the teaching process. In essence, they are less likely to possess the aptitude to create the process for cultivating creativity in their pupils.

According to the results of RQ3, however, none of the correlations between urbanicity and teachers' CC, or between urbanicity and CFT intention were significant ($ps > 0.05$), indicating that teachers' conception of creativity and CFT intention were not influenced by teachers' living and working environment *directly*. This is inconsistent with our hypothesis that rural teachers may have less intention of creative fostering teaching than urban teachers. This may be a particular case in Guizhou where the disparity in CCs and CFT between urban and rural may not be severe enough to be detected. One possible reason could be that all the rural teacher participants in this study were recruited from public schools which received some level of supervision from the local education committee. Hence the rural teachers might have undertaken certain professional development which could have given them more desirable and updated educational ideas initiated by the government. Having said that, although urbanicity does not have any effects toward CCs and CFTs, it did affect the relationship between CCs and CFTs as we can see as follows.

5.2 Effect of teachers' CC on CFT intention

The second contribution of this study was to explore the impact of the moderating role of urbanicity on the relationship between teachers' CC and teachers' CFT intention. We put teachers' CC (four domains) as independent variable (x), teachers' CFT (nine domains) intention as dependent variable (y), and urbanicity (rural vs. urban) as moderator variable (w). All results shown in Table 3 indicated that the moderation effects are significant; interestingly, the effects of the interaction terms are negative. That means, urbanicity weakens the strength of correlation between teachers' CC and their CFT intention.

In rural areas, if teachers' creative characteristics are high, its effects on creative fostering teaching will be greater than those in the urban areas. According to the operational definition of urbanicity in the present study, it represents teachers' living and working environment, either urban or rural areas. Therefore, the negative joint effect indicated that teachers who are living and working in urban areas have weaker effect of teachers' CC on their CFT intention, when compared to teachers in rural areas. Urban teachers have more opportunity to obtain more educational resources (Ye, 2009), more frequent teacher training (Yang et al., 2014), and higher level of commonly held educational values (Yu et al., 2011) that reflect their higher teacher qualifications than teachers in rural areas. These advantages provided by urban resources may enhance teachers' beliefs of cultivating children's creativity and thus decrease the magnitude of teachers' perception of creativity influence on their CFT intention. It is possible that these educational resources and trainings provide some important factors, which play important roles in increasing teachers' CFT intention other than perception of creativity. On the other hand, disadvantage of quality of life (Ji & Qiu, 2019; Hu et al., 2015), lacking opportunities for promotion and improving professional skills (Qin & Zeng, 2018), and mismatching of teachers' training from schools to the rural requirements (Wang, 2011) in rural areas decrease teachers' eagerness to cultivating children's creativity. Therefore, rural teachers' intention of creative fostering teaching relies more on teachers' conception of creative characteristics. It is worth noting that our result does not show educational resources or trainings in urban areas might enhance teachers' perception of creativity. Under this perspective, in order to enhance teachers' creative fostering teaching, nurturing teachers in rural areas are likely to be more effective than nurturing teachers in urban areas.

5.3 Further research directions and limitations

Though we do not have direct evidence regarding how fundamentally urban and rural teachers differ in terms of creativity fostering training, we do find some effects in urbanicity which represent teachers' living and working environment at a given time. Or perhaps, the urban working environment is so inherently different compared to rural locations that a different skillset and mentality is required to accommodate urban life. To narrow the gap between urban and rural creative fostering teaching, more training and exposure to difference practices for teachers and supporting staff in CFT are needed. And by relevant training, it should mean training based on a good understanding of these rural teachers, including their views of teaching and learning suitable for children in the villages, in this case, on children's creativity. According to the above results, teachers' perceptions of creative characteristics influence their creative fostering teaching intention. This study was conducted in the Qiandongnan region of Guizhou province in southwest China where different ethnic minority groups reside in both urban and rural areas. But given the multi-ethnic composition of people in China, a deeper understanding of the concerned perceptions of teachers from various ethnic minority backgrounds is crucial for effective training and precision of resources allocation.

Readers should note that these relationships are not causal. The current study is limited by its cross-sectional design; thus, our findings are correlational. Future studies could benefit from a longitudinal design that tracks children and teachers over time. Socio-economic status is not included here, which is something that can be considered in the future. Most importantly, this paper is limited by the degree and extent that urbanicity is measured. Further studies can discuss the concept of urbanicity in more details.

6 Conclusion

This article presents a small study which examines the possible factors leading to the discrepancies in teachers' perception and intention for the promotion of creative education between teachers in two contexts of China. The study was conducted amidst the immense and still on-going government effort to reduce the gap across many aspects, education included, between the urban and rural areas. As challenging as it could be, the success of this government initiative requires the policy makers much more careful considerations of the environmental factors that teachers in different contexts are facing, rather than simply providing more resources and training programs at their face values.

Appendix 1: Nine domains of Creative Fostering Teaching (CFT) (Soh, 2000)

(1) Independence: Encouraging students to learn independence.
(2) Integration: Having a co-operative, socially integrative style of teaching.
(3) Motivation: Emphasizing mastery of knowledge to enable divergent thinking.
(4) Judgment: Delaying judgment on students' ideas and encouraging them to more clearly formulate the ideas.
(5) Flexibility: Promoting flexible thinking.

(6) Evaluation: Encouraging self-evaluation in students.
(7) Question: Taking students' suggestions and questions seriously.
(8) Opportunities: Creating opportunities for students to work under varied conditions with a variety of materials.
(9) Frustration: Helping students to learn to cope with frustration and failure, so that they have the courage to try the new and unusual.

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Conflict of interest The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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