

Relationships between teacher value orientations, collegiality, and collaboration in school professional learning communities

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Received: 5 April 2014 / Accepted: 17 January 2015 / Published online: 10 February 2015
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Abstract Unlike past research which has mainly examined whole school or whole department professional learning communities, this study focused on factors related to effective collaborative practices within teacher learning teams. Our main objective was to ascertain the roles of team value orientations (collectivism and power distance) and team collegiality in explaining team collaboration. Based on data obtained from 207 learning teams, structural equation modelling demonstrated that team collectivism had a positive effect on team collegiality. In addition to being a significant positive predictor of team collaboration, team collegiality was also found to mediate the effects of team collectivism on team collaboration. Although we did not detect any significant direct or indirect effect of team power distance on team collegiality or team collaboration, latent interaction analysis identified team power distance as a moderator of the relationship between team collegiality and teacher collaboration. It was found that the positive effects of team collegiality on team collaboration were stronger for teams with lower levels of power distance. Our findings draw attention to the important roles of team value orientations and collegiality in the context of teacher professional learning. Implications for teacher professional development and directions for future studies were also discussed.

Keywords Professional learning communities · Hofstede · Collectivism · Power distance · Team collegiality · Team collaboration

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1 Introduction

Professional learning community (PLC) is a professional development initiative derived from day-to-day work practices (Dunne et al. 2000). PLCs are defined as “educators committed to working collaboratively in ongoing processes of collective inquiry and action research to achieve better results for the students they serve” (DuFour et al. 2008, p. 14). The benefits of PLCs are well-documented in the literature, in that a large body of existing research has established the positive impact of PLCs on both teacher and student outcomes (see comprehensive review by Vescio et al. 2008). Studies reviewed by Vescio et al. (2008) have shown that effective school PLCs can lead to significant changes in teaching cultures and practices, such as increased use of student-centered instructional approaches and authentic pedagogies and higher levels of social support for achievement (e.g. Dunne et al. 2000; Louis and Marks 1998; Strahan 2003). Other studies which have examined the relationship between teachers’ participation in PLCs and student achievement have also indicated significant improvement in students’ performance in standardized tests (e.g. Phillips 2003; Strahan 2003). Phillips’ (2003) case study, for example, documented a middle school’s efforts to create an authentic learning community with the focus on improving both teacher and student learning. Findings revealed that the PLC implementation resulted in teachers’ increased participation in high-quality professional development and collaborative practices, as well as dramatic growth in student academic achievement. The results indicated that students’ passing rates in state-wide standardized assessments increased from 50 to 90% in the last 3 years of implementation, which raised the school’s rating from acceptable to exemplary.

As opposed to discrete professional development courses, PLCs are sustained by teachers’ continuous collaborative effort, which is the fundamental principle of professional learning communities (DuFour 2004). Teacher collaboration refers to the professional collaborative and cooperative practices and activities that teachers engage in to achieve their shared educational goals. Effective collaboration between teachers has long been recognized as a vital component to teacher professional development and student success (Lieberman 1990; Little 1982). Hord (1997) conceptualized teacher collaboration in PLCs by two core dimensions, namely *collective learning and application* and *shared personal practice*. Collective learning and application requires teachers to prioritize professional advancement as a collective and derive the best strategies to optimize student learning and outcomes (Anderson and Herr 2011; DuFour et al. 2010; Hargreaves 2003; Mitchell and Sackney 2000; Toole and Louis 2002). Teachers are required to engage in processes to continuously learn and work together as a collective to seek new knowledge and skills, and apply them to improve practice and address students’ needs (Hipp and Huffman 2007; Hord 2004). Sharing of personal practice (also known as “deprivatized practice”; Louis et al. 1996, p. 760) requires teachers to engage in activities such as peer coaching, classroom observations, lesson study and discussion etc. to advance their professional development (Hord 1997; Stoll et al. 2006). Bryk et al. (1999) found that when teachers engage in peer observation and feedback and open their practice up to scrutiny by colleagues, they learn to ask questions and evaluate their practices in a more analytic fashion. Moreover, when teachers share their expertise and effective instructional strategies with each

other through continuous inquiry and reflective dialogue, a shared understanding is formed and collective professional advancement is fostered (Brownell et al. 1997; Little 2003; Smylie 1995). Teacher collaboration can thus cultivate teachers' sense of belonging when they offer peer support in charting out a continuous learning journey and helps sustain improvement by strengthening the networking and professional affiliation among teachers (Louis 1992). With an emphasis on peer-facilitated professional development which departs from traditional notions of learning as confined to workshops delivered by "experts", PLCs thus represent a re-orientation towards deep learning in professional development.

1.1 Teacher collegiality

Within schools and departments, teachers are often grouped together into smaller professional learning teams. The effectiveness of teacher learning teams hence relies mainly on team members' willingness to set aside individual differences in holding appointments within the school to engage in collaborative activities and learn from one another (Stoll et al. 2006; Webster-Wright 2009). With respect to factors that affect teacher collaboration, past research has provided evidence for the positive effect of teacher collegiality on collaboration (Jarzabkowski 2002). Teacher collegiality is defined as "teachers' involvement with the peers on any level, be it intellectual, moral, political, social and/or emotional" (Jarzabkowski 2002, p. 2). It is related to the quality of the relationships among teachers, including respect, trust, norms of critical inquiry and improvement, and positive, caring relationships (Hipp and Huffman 2007). Hargreaves and Dawe (1990, p. 227) also defined and analysed the differences between authentic collegiality (which "comprises of evolutionary relationships of openness, trust, and support among teachers where they define and develop their own purposes as a community") and contrived collegiality (which "consists of administratively contrived interactions among teachers where they meet and work to implement the curricula and instructional strategies developed by others"). They found that authentic collegial relationships between teachers can indeed foster teacher and curriculum development, whereas the contrived form of collegiality merely enhances administrative control. In relation to school PLCs, the quality of the collegial relationships among teachers is considered fundamental and necessary for their successful implementation (Bryk et al. 1999; Lee et al. 2011; Musanti and Pence 2010). Bryk et al. (1999, p. 767) asserted that "when teachers trust and respect each other, a powerful social resource is available for supporting the collaboration, reflective dialogue, and deprivatization characteristics of a professional community". Thus, a collegial professional learning team climate (whereby team members trust and respect each other and engage in supportive and productive interactions with one another as professional colleagues) is extremely crucial for teachers' collaborative learning and development.

1.2 Teacher value orientations

Whilst research on PLCs has made important strides in identifying school and contextual factors which influence teacher collaboration (Harris and Jones 2011; Heaney

2004; Hirsh 2005; Van Eekelen et al. 2006; Penuel et al. 2007), team relationships and collaborative behaviors are most directly influenced by team members' personal attributes (e.g. demographics, values, beliefs, attitudes) and factors inherent in the social dynamics of the team. Compared to task and work environment factors, Kwakman (2003) found that teachers' personal factors are more significant in predicting their participation in professional learning activities. As professionals, teachers interpret new work initiatives according to their personal values (Stoll et al. 2006). In the participation of professional learning activities, the personal values held by teachers are unconsciously invoked and teachers act as predisposed by these values (Garnham and Williams 1980). However, a single individual should not be solely held accountable for the quality of learning teams. The mental schema and dispositions of the learning team as a whole, underpinned by the value orientations of the team members, function as facilitators/barriers to team members' engagement in collaborative activities when they work and learn collectively as a group.

Collectivism and *power distance* are the two value orientations which have received the most attention in the organizational literature and have been shown to be the most important dimensions in relation to team relations, interactions, and collaboration (Basabe and Ros 2005; Gibson and Zellmer-Bruhn 2001). As mentioned earlier, professional learning communities require the willingness and ability of teachers to collaborate with each other in the advancement of professional learning. This requires a collectivistic view of the self as an integral part of the teacher professional network. The value-concept of collectivism has been advanced by Hofstede (2001) as the prioritisation of group interests over self-interest, as opposed to individualism which refers to the prioritisation of self-interest over group interest. As opposed to individualists, past studies have shown that collectivists have higher regards for team harmony (Oyserman et al. 2002) and lower resistance to teamwork (Kirkman and Shapiro 2001a). Chen and Tjosvold's (2008) study which examined collectivist values for productive teamwork found that a collectivist team culture can strengthen teammates' collegial relationships. These quality collegial relationships in turn can develop confidence in collaboration among teammates and improve productivity. Ford and Chan (2003) also found that in low collectivism cultures, knowledge sharing can be more difficult as individuals view knowledge as a source of power, and knowledge hoarding is a tool which can provide advantages and success for oneself. But in high collectivism cultures, knowledge sharing is much more common if it is seen as beneficial to the group.

In a perfect world, teachers learn from each other as collegial peers. But in reality, teachers may remain conscious of whose opinions hold more weight based on the position the sharer holds at school, and submit to those who are in authority. The value-concept of power distance is defined as "the extent to which the less powerful members of a society expect and accept that power is distributed unequally" (Hofstede 2001, p. 98). At the individual-level, this refers to "the extent to which an individual accepts the unequal distribution of power in institutions and organizations" (Clugston et al. 2000, p. 9). According to Hofstede (2001), there are generally greater acceptances for inequalities and differences in status in high power distance societies and organizations, whilst in low power distance societies and organizations the inequalities and differences in status are less explicit. Past organizational research studies have found that high power distance individuals tend to be more comfortable working in teams

with strong leadership and top-down communication and decision-making, but low power distance individuals tend to prefer working in autonomous and self-directed teams where every member is treated as equal regardless of status or position and decision-making is by consensus and more collegial (Earley and Erez 1997; Kirkman and Shapiro 1997; Liu et al. 2012). In relation to work team interaction, research has also indicated that high power distance individuals tend not to have the same communication effectiveness as lower power distance individuals (Xie et al. 2009) and are also less likely to question those with higher status and power (Earley 1999). Since participation and involvement in collaborative activities are more probable when teachers perceive each other as equal and fellow professionals belonging to the same collective, the collaborative nature of PLCs seem to be more congruent with low power distance orientation.

1.3 The present study

The concept of PLC which strives to develop collaborative work cultures for teachers has become a promising approach for enhancing instructional effectiveness and student learning. It is thus very important to understand what factors are associated with effective PLCs. Although teacher learning teams have become progressively more prevalent in schools, the majority of existing research has focused on whole school or whole department PLCs (e.g. Lomos et al. 2011; Little 1982; Rosenholtz 1989), and relatively less research effort has been devoted to understand what underlies effective teacher professional learning teams. In this study we adopted the team-level perspective and focused our attention on the social and collaborative aspects of professional learning teams, namely team collegiality and collaboration. Whilst research conducted in non-educational settings have established the critical roles of individual value orientations in shaping team processes as well as team performance (e.g. Kirkman and Shapiro 1997, 2001a, b), we are not aware of any empirical studies which have examined the roles of teacher value orientations in affecting the effectiveness of teacher professional learning teams in the educational setting. We therefore aimed to investigate how teacher value orientations are related to teacher collegial relationships and collaboration at the learning team level.

Specifically, the main objective of this study was to ascertain the interrelationships between the following constructs: team value orientations (collectivism and power distance), team collegiality, and team collaboration (collective learning and application and shared personal practice). Unlike a lot of the past research which utilized manifest variables based on aggregated scale scores, the constructs of interest in this study were treated as latent variables and structural equation modelling (SEM) was used to control for measurement error. Since team size, team gender distribution and team members' years of teaching experience are very possibly related to team collegial relationships and collaboration, we also included these variables as controls to prevent for potential biases in our analyses. On the basis of previous findings described in the introduction, we hypothesized the following relationships as depicted in the structural model presented in Fig. 1: (Hypothesis 1) team collegiality would exert significant positive influence on team collaboration, (Hypothesis 2) team value orientations would exert

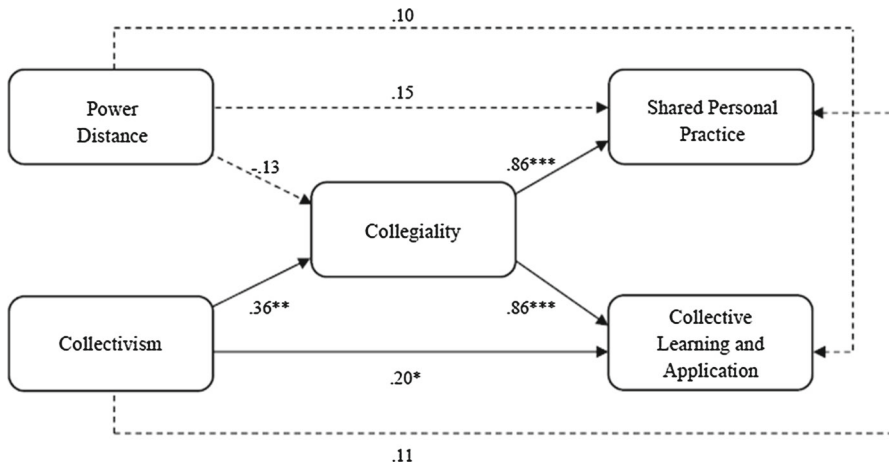


Fig. 1 Structural equation model depicting the relationships between team value orientations, team collegiality, and team collaboration ($\chi^2(146) = 268.16, p < .05$, CFI = .93, RMSEA = .064, AIC = 8,008.54, BIC = 8,258.50, Adjusted BIC = 8,020.86). * $p < .05$; ** $p < .01$; *** $p < .001$

significant influence on team collegiality, and (Hypothesis 3) team value orientations would exert influence on team collaboration via team collegiality (i.e. we postulated that team collegial relationship could potentially explain some of the influence of team value orientations on team collaboration). In addition to the above relationships, we also hypothesized the existence of possible interaction effects between team value orientations and team collegiality on team collaboration (Hypothesis 4). That is, the structural model in Fig. 1 was extended to include two-way and three-way interaction effects between team power distance, team collectivism, and team collegiality in the prediction of team collaboration.

2 Method

2.1 Sample and procedures

Our data came from a large-scale baseline study conducted to inform the status of the implementation of professional learning communities (PLC) in Singapore schools. Professional learning teams from Singapore schools were invited to participate in the study. All respondents were primary or secondary school teachers. The source of data for this study was an online questionnaire survey. Respondents were first asked to complete the online informed consent. Confidentiality and privacy were assured to all respondents returning the questionnaire and the school that they represented. Instructions and explanatory notes were provided to respondents and they were allowed as much time as they needed to complete the questionnaire.

Our sample comprised of 952 teachers from 207 learning teams from 95 schools. Overall, 75.4 % of the respondents were female. Approximately 27 % of the respondents aged 29 or below, 41 % aged 30 to 39, 21 % aged 40 to 49, and 11 % aged 50 or

Table 1 Sample item for the five constructs used in this study

Construct	Sample item
Value orientations	
Power distance (3 items)	People in lower positions should not disagree with decisions by people in higher positions
Collectivism (3 items)	Group well-being is more important than individual rewards
Collaboration	
Shared personal practice (5 items)	Teachers in my learning team share with one another their evidence-based approach to improve practice
Collective learning and application (3 items)	Teachers in my learning team learn together and apply the new knowledge to solve problems
Collegiality (3 items)	Caring relationships exist among teachers that are built on trust and respect

above. In terms of duration of service, around 37 % has been in the teaching service for <5 years, 26 % for 5 to <10 years, and 37 % for 10 years or more.

2.2 Measures

2.2.1 Team value orientations

Items from the Individual Cultural Values Scale (CVSCALE; Yoo et al. 2011) were used to measure two dimensions of value orientations, namely collectivism and power distance (see Table 1 for sample items). The respondents were asked to respond to all the questionnaire items on a 6-point Likert-type scale, ranging from 1 (strongly disagree) to 6 (strongly agree). Items were such that high values on these scales represent a high level collectivism or power distance. Teachers' individual responses were aggregated to the team level to reflect team value orientations.

2.2.2 Team collegiality

Team collegiality was measured using three items adapted from Olivier et al.'s (2003) Professional Learning Communities Assessment (see Table 1 for sample item). Since data were collected from individual teachers and then aggregated to the team level, we utilized a referent shift consensus model of aggregation (Chan 1998), i.e., teachers were asked to report their perceptions of their respective learning teams' collegial relationships (with learning team as the referent). The respondents were asked to rate the items on a 6-point Likert-type scale, ranging from 1 (strongly disagree) to 6 (strongly agree).

2.2.3 Team collaboration

Items from Olivier et al.'s (2003) Professional Learning Communities Assessment and Bolam et al.'s (2005) EPLC survey were adapted to measure two dimensions of team collaboration (see Table 1 for sample items), namely shared personal practice (5 items)

and collective learning and application (3 items). Similar to team collegiality, teachers were asked to report their perceptions of their respective learning teams' collaborative practices using a 6-point Likert-type scale, from 1 (strongly disagree) to 6 (strongly agree).

2.2.4 Control variables

We also included team size, team gender distribution and team members' average years of teaching experience as covariates in our models.

3 Results

In this data set, there were no missing data for all the items examined in this study. Measures were screened for outliers and normality of distribution. The distributions of all continuous variables were approximately normal. To assess the appropriateness of aggregating individual scores to the team-level, [James \(1982\)](#) recommended the use of two intraclass correlations: ICC(1) which examines agreement among group members, and ICC(2) which is an estimate of the reliability of the mean scores for the groups (i.e. the reliability that the groups can be differentiated). [James \(1982\)](#) suggested that ICC(1) values $> .12$ indicate an adequate level of within-group agreement, whilst ICC(2) values $\geq .70$ are commonly considered acceptable and support aggregation. We computed these indices and they were all satisfactory and justified the aggregation of individual scores to the team level: power distance, ICC(1) = .42 and ICC(2) = .79; collectivism, ICC(1) = .54 and ICC(2) = .86; collegiality, ICC(1) = .51 and ICC(2) = .84; shared personal practice, ICC(1) = .40 and ICC(2) = .78; collective learning and application, ICC(1) = .49 and ICC(2) = .83. Although our data has a three-level nested structure (i.e. teachers in teams in schools), preliminary analyses revealed that there were insufficient variance in the dependent variables that could be attributed to school-level characteristics, thus team-level analyses were deemed appropriate. Nevertheless, corrections were still made to the standard errors and Chi square test of model fit to take into account the nested structure of the data using the Mplus TYPE = COMPLEX and CLUSTER commands ([Muthén and Muthén 2010](#)).

3.1 Measurement models

Prior to examining the structural relationships between team value orientations, team collegiality, and team collaboration, confirmatory factor analyses were conducted to assess the validity of the measurement models at team-level. A combination of indices were used to assess model fit, including the Chi square statistic, the comparative fit index (CFI: $> .90$ acceptable fit, $> .95$ excellent fit; [Bentler 1990](#)), the root mean square error of approximation (RMSEA; $< .08$ acceptable fit, $< .05$ excellent fit; [Browne and Cudeck 1993](#)), the Akaike information criterion (AIC; [Akaike 1974](#)), the Bayesian information criterion (BIC; [Schwarz 1978](#)), and the sample-size adjusted BIC. The AIC and BIC indices are comparative measures of fit and are only meaningful when two of more measures are compared. Models with smaller values indicate better fit.

Confirmatory factor analysis of the team-level data revealed that the two factor model of value orientations (power distance and collectivism) fitted the data well ($\chi^2(8) = 21.61, p < .01, CFI = .97, RMSEA = .041, AIC = 3,165.33, BIC = 3,228.66, \text{Adjusted BIC} = 3,168.46$). The two factor model of collaboration (shared personal practice and collective learning and application) also provided good fit to the data ($\chi^2(19) = 51.54, p < .001, CFI = .94, RMSEA = .041, AIC = 3,419.89, BIC = 3,503.21, \text{Adjusted BIC} = 3,423.99$). Prior to the imposition of a structural model, we also examined a measurement model in which team value orientations, team collegiality, and team collaboration were evaluated simultaneously. Results suggested that this model fitted the data well ($\chi^2(109) = 202.82, p < .05, CFI = .94, RMSEA = .064, AIC = 8,004.97, BIC = 8,208.27, \text{Adjusted BIC} = 8,014.99$).

3.2 SEM analysis

Structural equation modelling (SEM) was used to examine the interrelationships between team value orientations, team collegiality, and team collaboration. Path coefficients and model fit statistics for the structural equation model are shown in Fig. 1. We also controlled for the possible effects of team size, team gender distribution, and team average teaching experience by regressing the two value orientations, team collegiality and team collaboration onto these variables (not shown in Fig. 1). The model accounted for 81 and 73.2 % of the variances in team collective learning and application and shared personal practice, respectively. By examining the path coefficients in Fig. 1, one can see that team collegiality had large positive effects of $\beta = .86$ ($p < .001$) on both measures of team collaboration (collective learning and application and shared personal practice), which is consistent with Hypothesis 1. In the evaluation of the direct impacts of team value orientations on team collegiality (Hypothesis 2), it was found that whilst team collectivism had a significant and positive direct effect on team collegiality ($\beta = .36, p < .01$), no statistically significant direct effect was detected for team power distance on team collegiality.

Since team power distance was not a significant predictor of team collegiality, team collegiality cannot be a mediator in the relationships between team power distance and team collaboration. But to test the potential mediation effects of team collegiality on the relationships between team collectivism and team collaboration (Hypothesis 3), we followed Baron and Kenny's (1986) procedure for testing mediation. Results revealed that in the absence of team collegiality, team collectivism exerted significant influence on both measures of team collaboration. But in the presence of team collegiality (as shown in Fig. 1), the effect of team collectivism was only significant on collective learning and application ($\beta = .20, p < .05$) and not shared personal practice ($\beta = .11, p > .05$). This suggested that team collegiality was a partial mediator of the relationship between team collectivism and collective learning and application, but a full mediator of the relationship between team collectivism and shared personal practice.

3.3 Latent interaction analysis

To ascertain possible interaction effects between team value orientations and team collegiality on teacher collaboration (Hypothesis 4), latent interaction structural equa-

tion modelling was conducted using Mplus 6 (Muthén and Muthén 2010). Similar to testing interaction effects using hierarchical regression, we first tested the main effects in step 1. We then examined the main effects together with all the two-way interactions in step 2, followed by the inclusion of the three-way interaction effect in step 3 (see Table 2). Because the conventional model fit indices are not available for latent interaction analysis in Mplus, the AIC (Akaike 1974), BIC (Schwarz 1978), and the sample-size adjusted BIC were used to select the best model for which the estimates were interpreted.

Based on the AIC and adjusted BIC, the secondary model was deemed to provide the best fit to the data, with a significant and sizable two-way interaction effect between team collegiality and team power distance. This model explained 78.2 and 84.4 % of the variances in shared personal practice and collective learning and application, respectively. In the presence of interaction terms, team collegiality was still a strong significant predictor of both measures of team collaboration ($\beta = .88, p < .001$). Significant and positive direct effect was still detected for team collectivism on team members' collective learning and application ($\beta = .21, p < .05$).

The latent interaction analysis revealed a significant two-way interaction effect between team power distance and team collegiality on both measures of teacher collaboration. To identify the locus of this interaction effect, simple slope analyses were conducted to visualize the strength of the linear relationships between team collegiality and team collaboration across high and low-levels of team power distance; computed as +1 and -1 standard deviations from the mean (Aiken and West 1991). As illustrated in Fig. 2 (left panel), the positive relationship between team collegiality and team members' shared personal practice appeared stronger for teams with lower levels of power distance than those with high-levels (i.e., the slope for those with lower levels of power distance showed a steeper gradient). Figure 2 (right panel) also showed that the positive relationship between team collegiality and team members' collective learning and application was stronger for those teams with lower levels of power distance, rather than higher levels of power distance. These results thus indicated that the positive impacts of team collegiality on teacher collaboration were much stronger for teams with lower levels of power distance than for those with higher levels of power distance. Hence, these identified relationships between team value orientations, team collegiality, and team collaboration can be conceptualized as a moderated mediation model as shown in Fig. 3, where team power distance played a moderator role in the relationship between team collegiality and teacher collaboration.

4 Discussion

Unlike past studies which have typically examined whole school or whole department professional learning communities, this study extended the current literature by focusing on factors associated with effective teacher learning teams. Our main objective was to ascertain the roles of team value orientations and team collegiality in explaining team collaboration. Results from structural equation modelling demonstrated that team collectivism had a positive and moderate effect on team collegiality. This finding is in line with past studies which have established the link between collectivistic values and

Table 2 Predicting team collaboration: results from latent interaction structural equation modelling

	Shared personal practice			Collective learning and application		
	Main	+Secondary	+Tertiary	Main	+Secondary	+Tertiary
Main effects						
Power distance → collegiality	-.13	-.12	-.11			
Collectivism → collegiality	.36**	.37**	.37**			
Collegiality	.86***	.88***	.87***	.86***	.88***	.86***
Power distance	.15	.16	.16	.10	.11	.08
Collectivism	.11	.12	.13	.20*	.21*	.20*
Two-way interaction effects						
Collegiality × power distance		-.29***	-.26**		-.20**	-.28**
Collegiality × collectivism		.09	.06		-.03	-.01
Power distance × collectivism		.20	.24		.21	.24
Three-way interaction effect						
Collegiality × power distance × collectivism			-.09			.18
Control						
Gender	.10	.10	.10	.03	.03	.04
Team size	.06	.05	.05	.06	.06	.05
Years of teaching	-.05	-.04	-.03	-.05	-.04	-.03
Gender → collegiality	.01	.01	.01			
Gender → power distance	.01	.01	.02			
Gender → collectivism	-.09	-.08	-.08			
Team size → collegiality	-.14	-.14	-.14			
Team size → power distance	.09	.09	.02			
Team size → collectivism	.11	.10	-.08			

Table 2 continued

	Shared personal practice			Collective learning and application		
	Main	+Secondary	+Tertiary	Main	+Secondary	+Tertiary
Years of teaching \rightarrow collegiality	.12	.11	.11			
Years of teaching \rightarrow power distance	-.03	-.03	-.03			
Years of teaching \rightarrow collectivism	.10	.10	.10			
Model fit						
AIC	8,008.54	8,005.56	8,005.94			
BIC	8,258.50	8,275.51	8,282.56			
Sample-size adjusted BIC	8,020.86	8,018.86	8,019.58			

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

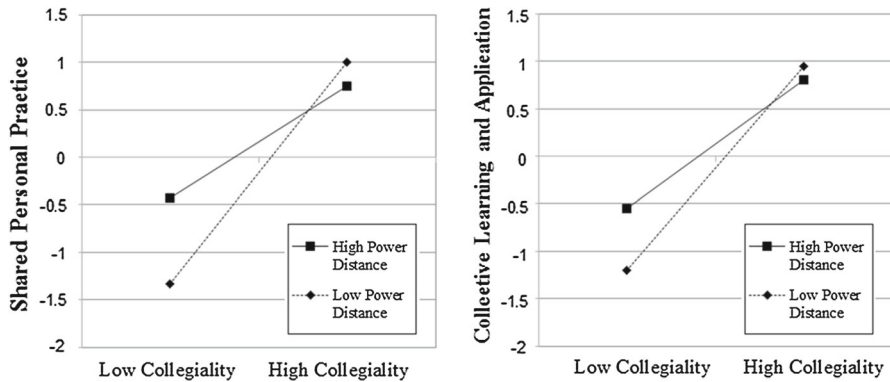


Fig. 2 The two-way interaction effects between team power distance and team collegiality on teachers' shared personal practice (*left panel*) and collective learning and application (*right panel*)

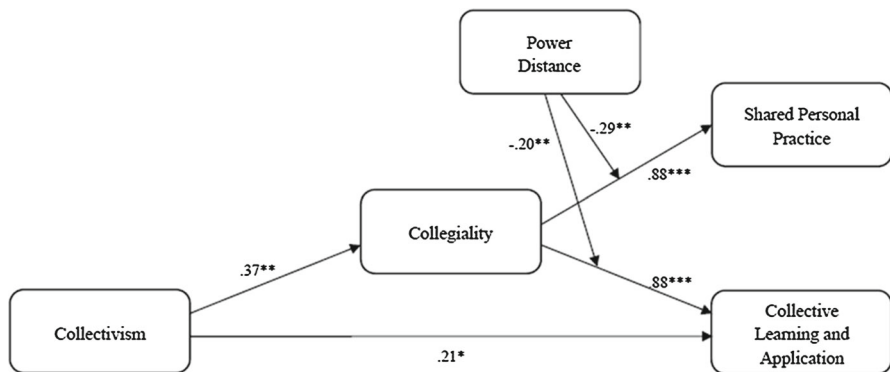


Fig. 3 Conceptualization of the identified relationships between team value orientations, team collegiality, and team collaboration as a moderated mediation model. * $p < .05$; ** $p < .01$; *** $p < .001$

team relationships and harmony (Kirkman and Shapiro 1997, 2001a; Oyserman et al. 2002). In addition, our results also indicated that team collegiality was a significant and positive predictor of both measures of team collaboration (shared personal practice and collective learning and application). This corroborated with findings from previous teacher research which has shown that collegial relationships with colleagues can indeed encourage cooperation and collaborative work practices (Jarzabkowski 2002). Moreover, our findings confirmed our hypothesis regarding the mediator role of team collegiality in the relationship between team collectivism and team collaboration. Team collectivism was found to exert both direct and indirect effects on team collaboration, which implied that some of the positive effects of team collectivism on team collaboration can be attributed to team collectivism-induced collegiality among the teachers. This finding echoed our expectation that team collectivistic values can indeed strengthen teammates' collegial relationships, which in turn can foster team collaboration.

Although we did not detect any significant direct or indirect effect of team power distance on team collegiality or team collaboration, our analysis of interaction effects provided support for the moderator function of team power distance in the association between team collegiality and collaboration. The significant interaction effect between team collegiality and power distance indicated that when team collegiality is high, the level of team collaboration is similar for both high power distance and low power distance learning teams. But when team collegiality is low, low power distance teams reported significantly lower levels of team collaboration than high power distance teams. This finding thus implied that for low power distance learning teams, team collegiality is a crucial determinant of team collaboration; whilst for high power distance teams, team collegiality is less critical of a factor. These results can plausibly be explained by Hargreaves and Dawe's (1990) concept of authentic and contrived collegiality. The PLC policy initiative in Singapore is a systemic implementation which utilized a standardized model to formally integrate PLC into the school strategic framework (Hairon and Tan 2013). Since high power distance individuals tend to prefer top-down communication and decision-making and have higher tolerance for unequal power distribution and less collegial settings, it is quite likely that authentic collegiality may not be a necessary prerequisite or a driver for their collaborative efforts. It could be that the mere existence of a contrived form of collegiality ("administratively contrived interactions among teachers where they meet and work to implement the curricula and instructional strategies developed by others"; Hargreaves and Dawe 1990, p. 227) is sufficient for high power distance teams to engage in PLC-related collaborative activities. On the contrary, past research has shown that low power distance individuals tend to prefer egalitarian team environments characterized by collegial interactions and dialogue and consensus decision-making (Earley and Erez 1997; Kirkman and Shapero 1997). It is therefore possible that the absence of authentic collegial relationships among team members may have impeded PLC collaborative practices in low power distance learning teams.

Whilst our study has many notable strengths and the findings are of significance, there are also some limitations which must be noted. Firstly, as the current study is based entirely on teacher learning teams in Singapore schools, the results may not be generalizable to other countries. Given the cultural diversity of Singapore, it would be worthwhile to examine whether team ethnic composition impacts upon team collegiality and collaboration. Secondly, since school contextual characteristics are known contributors to cultural value orientations and teacher behaviors, future research can also utilize multilevel modelling techniques to simultaneously assess the impacts of school, team, and individual effects on team collaboration and other outcomes of professional learning. Finally, results from this study are based entirely on quantitative data obtained from a self-report questionnaire survey. Although self-report measures are the only methods feasible when dealing with large sample sizes, they are however, susceptible to social desirability response bias and have the disadvantage of low validity. The assessment of team collegiality and team collaboration could potentially be strengthened if data based on other protocols (such as structured interviews and observations) were included for triangulation purposes.

Overall, this study enriched our understanding of collaboration in teacher learning teams and the ways in which team members' value orientations and their collegial

relationships can influence team collaborative efforts. Our study contributed to the existing literature in two ways. From a theoretical perspective, the findings from this study extended our current knowledge in this emerging area of teacher professional development by depicting the important roles of team value orientations and collegiality in the context of teacher professional learning. We offered a more mechanistic explanation of how teachers' personal value orientations can affect the quality of the social relationships among team members which in turn impact team collaboration. From a practical perspective, our study contributed to a better understanding of how to utilize team cultural capital to achieve team effectiveness. The present findings suggested that team collectivism is linked to team collegiality which has significant influence on team collaboration. This offers new insights to allow better alignment of efforts, such as the assignment of individuals with high collectivistic values to each learning team to better foster harmonious team climates and promote collaborative practices. Findings from this study are also relevant to advancing research on school culture. Since our results suggested that team collegiality is such a significant predictor of team collaboration (especially for low power distance teams), a sustained effort should be made by school leaders and management to encourage positive interactions among teachers (Stockard and Lehman 2004). The provision of supportive conditions (physical conditions and human capacities) for teachers to interact with each other can facilitate the cultivation of collegial atmosphere and encourage communication (Barth 1990; Heck and Marcoulides 1996; Hord 2004). To help reduce power differentials and bolster the development of authentic collegial relationships, teachers should also "be involved in school decision making and policy formulation and be given the freedom to function relatively unimpeded by superiors" to allow for greater exercise of autonomy in professional judgment (Pang 2003, p. 301).

Acknowledgments This work was supported by the Office of Education Research, National Institute of Education, Nanyang Technological University, Singapore.

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