

The relationships among teacher perceptions on professional learning community, collective efficacy, gender, and school level

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Abstract

This study examined the relationships among teacher perceptions on professional learning community (PLC), school organizational culture (SOC), and school level. Participants were 382 elementary school teachers and secondary school teachers in central Taiwan. The analytical results showed a positive correlation between teacher perceived PLC and SOC, *i.e.*, perceived PLC could predict perceived SOC. At clan and hierarchical culture levels, the PLC dimension *structural condition* was strongest predictor of perceived SOC. At market and adhocracy culture levels, however, human and social resources dimension was the best predictor. Moreover, elementary school teachers differed significantly from their secondary school counterparts in perceived PLC and SOC.

Keywords: Professional learning community, school organizational culture, school level

Introduction

Culture is a pattern of shared basic assumptions, invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration (Schein, 1987). Organizational culture which is defined as a set of norms, values, and beliefs is reflected in legends, rituals, symbols, and language (Daft, 1998). In the late 1970s and 1980s, the concept of organizational culture became popular as organizational researchers began paying much attention to it (Deal and Kennedy, 1982; Peters & Waterman, 1982; Pettigrew, 1979). The school is not only a physical space or a formal organization but also a social and psychological environment which develops the teachers' professional competence and raises their community consciousness (Ipek, 2010). School organizational culture (SOC) influences school faculty's norms, values and beliefs and contributes to teachers in professional development.

A professional learning community (PLC) of teachers has been considered as an effective way to improve teacher qualities and student learning in various dimensions (Goddard, Hoy, & Hoy, 2004; Thompson, Gregg, & Niska, 2004). Several studies describe the characteristics of PLC (for example, DuFour, DuFour, & Eaker, 2008; Hord, 1997; Stoll, Bolam, McMahon, Wallace, & Thomas, 2006) including supportive and shared leadership, shared values and vision, reflective dialogue, collective learning and application, supportive conditions, shared personal practice, and results orientation. Creation of a professional community could contribute to several potential advantages for schools and has a good influence on school organizational culture (Kruse & Louis, 1993; Little, 2002). Many literatures investigated related issues on PLCs (e.g. DuFour, DuFour, & Eaker, 2008; Hord, 2004) and on SOC (e.g. Gregory, Harris, Armenakis, & Shook, 2009; Shortell, et al., 2000), but few research explored the relationships between both.

Because of the unprecedented K-12 educational reforms recently implemented in Taiwan, PLCs have received considerable attention, especially at the elementary and secondary school levels. Traditionally, schools' normative control mechanism is based on rules, roles, and regulations rather than on value, norms, and belief structures (Kruse & Louis, 1993). Taiwanese government is encouraging schools to change organizational culture by building PLC which encourage teachers to engage in professional discussions, shared values and vision, reflective dialogue, and collective learning to change their traditional views. There are increasing numbers of teachers upgrade their professional competencies by attending school-based PLCs in Taiwan. This is also an important step towards the change of SOC.

The measure of SOC has been the subject of considerable interest among scholars and researchers. The central point of the Competing Values Framework (CVF), developed by Quinn and

Rohrbaugh (1983), is that organizational effectiveness depends on the organization's ability to satisfy multiple performance criteria based on four value sets (Quinn, 1988; Cameron & Quinn, 1999) including clan employee focused culture, market result focused culture, adhocracy/entrepreneurial culture, and hierarchy culture. The four sets of core values illustrate the orientation of organizations towards the competing demands of a variety of ongoing activities, such as competition, obligations, priorities or short term lines. According to Cameron and Quinn (1999), organizations must be adaptable and flexible but at the same time they must be stable and controlled. Organizations typically strive for growth, resource acquisition and external support, but they also want to maximize their control of information and formal communication. The CVF has been widely applied to studies of various organizational cultures (e.g. Ancarani, Mauro, Giammanco, 2009; Davies et al., 2007; Gerowitz, 1998; Helfrich, Li, Mohr, & Meterko, 2007; Meterko et al., 2004; Shortell et al., 2000), but few studies used CVF as a framework to investigate SOC. Thus, the present study based on the concept of CVF measures a teacher's perception of SOC and examines the relationship between SOC and perceived PLC, including correlation and prediction in Taiwan context. The findings of the present study should provide valuable information in this field and enhance the understandings on PLC and SOC in different cultural context.

2. Methodology

2.1. Participants

Fifth-four elementary and eleven secondary schools were randomly selected in central Taiwan to take part in the present study. 462 teachers from these schools were selected. To ensure confidentiality, each questionnaire was completed anonymously. With a response rate of 82.68%, 382 teachers returned completed questionnaires, including 73.3% elementary school teachers and 26.7% secondary school teachers.

2.2. Instruments

2.2.1 Perceived School Organization Culture Scale

One research instrument, the *School Organizational Culture Scale* (SOCS), was developed by the author based on the concept of Cameron and Quinn (1999) to measure SOC on four culture dimensions, namely, *clan*, *market*, *adhocracy*, and *hierarchy*. Twenty-four items in this scale were designed to measure four dimensions. The first dimension, *clan* culture (6 items), measured values that are internal, flexible, concern for people and customers, *market* culture (6 items) measure values that are external with a need for stability and control. The third dimension, *adhocracy* culture (6 items), measured an external orientation with a high degree of flexibility and individuality. The fourth dimension, *hierarchy* culture (6 items), measured internal maintenance and control values. Teachers were asked to rate the items on a four-point Likert scale anchoring at 1, 2, 3, and 4 (strongly disagree, disagree, agree, strongly agree). The factor analysis made on data obtained by SOCS in the current

application reveals that each item in all subscale dimensions produced factor loadings from .87 to .90. The overall internal consistency (Cronbach's $\alpha = .94$) for the scale in the current sample was good. The Cronbach's α for the four subscales ranged from .88 to .93, indicating good internal consistencies of the items within each subscale.

2.2.2. *Perceived Professional Learning Community Scale*

Another one research instrument, the *Perceived Professional Learning Communities Scale* (PLCS) was developed by the author based on previous literatures and studies (DuFour, DuFour, & Eaker, 2008; Hord, 1997, 2004; Kruse & Louis, 1993) to measure a teacher's perception of a PLC on three dimensions, namely, *core elements*, *human and social resources*, and *structural conditions*. Fourteen items in this PLCS were designed to measure three dimensions. The first dimension, core elements (6 items) measured the teachers' reflective dialogue, shared values and vision, shared practice, collective learning and application of learning. The second dimension, human and social resources (4 items) measured a school's physical conditions and human capacities that encourage and sustain a collegial atmosphere and collective learning. The third dimension, structural conditions (4 items) measured conditions necessary support to create an environment of internalized connection between teachers in academic work, such as time to meet and talk, physical proximity, interdependent teaching roles, and communication structures. Teachers were asked to rate the items on a four-point Likert scale anchoring at 1, 2, 3, and 4 (strongly disagree, disagree, agree, strongly agree). The factor analysis made on data obtained by PLCS in the current application reveals that each item in all subscale dimensions produced factor loadings from .84 to .98. The overall internal consistency (Cronbach's $\alpha = .94$) for the scale in the current sample was good. The Cronbach's α for the three subscales ranged from .92 to .87, indicating good internal consistencies of the items within each subscale.

2.3. *Data analysis*

The statistical program SPSS 20.0 for windows was used for data analysis. First of all, four composite score of *clan culture*, *market culture*, *adhocracy culture*, and *hierarchy culture* were computed for each respondent by adding the scores on the 24, 6, 6, and 6 items in the perceived SOC scale respectively measuring total SOC, *clan culture*, *market culture*, *adhocracy culture*, and *hierarchy culture* condition. Similarly, a total perceived PLC score as well as three composite scores of core elements, human and social resources, and structural condition were computed for each respondent by adding the scores on the 14, 6, 4, and 4 items in the perceived PLC scale respectively measuring total PLC, core elements, human and social resources, and structural condition. Descriptive statistics and product moment correlation coefficients were then computed for all variables in order to examine relationships between school level, perceived SOC and PLC. In addition, a series of *t*-tests was used to compare school level (elementary, secondary) as independent variables on the categories of perceived SOC and PLC as dependent variables. Finally, regression analysis was used to test with core element,

human and social resources, structural condition, as dependent variables and *clan* culture, *market* culture, *adhocracy* culture, and *hierarchy* culture and school level as independent variables in order to determine if the teachers' perceived PLC predicted their perceived SOC.

3. Results

All statistical tests used to address the questions in the present study used 0.05 as the minimum alpha level. The following tables present some descriptive statistics about variables as well as highlights from the inter-correlations matrix of the variables and the results of the independent sample *t*-test, Pearson product-moment correlation, and multiple regression analysis run in the present study.

3.1 difference analyses in school level on perceived SOC and PLC

Table 1 showed difference analysis results, which indicated that a significant difference between male teachers and female teachers in four SOC dimensions, *clan* culture ($t=-3.11, p < .01$), *market* culture ($t=-3.63, p < .001$), *adhocracy* culture ($t=-3.20, p < .01$), and *hierarchy* culture ($t=-4.01, p < .001$). Table 2 indicated that secondary school teacher perceptions differed significantly from elementary school teachers' in three PLC dimensions, *core elements* ($t=-3.69, p < .01$), *human and social resources* ($t=-4.54, p < .01$), *structural conditions* ($t=-2.91, p < .01$). In summary, significantly different perceptions were found between secondary school teachers and elementary school teachers in four SOC dimensions and three PLC dimensions.

3.2. Correlational analysis between perceived SOC and PLC

Table 3 showed the correlational analysis results, which indicated perceived SOC were significantly and positively correlated with PLC at overall level ($r=.45, p < .001$), at *clan* culture level ($r=.44, p < .001$), at *market* culture level ($r=.42, p < .001$), at *adhocracy* culture level ($r=.46, p < .001$), and at *hierarchical* culture level ($r=.44, p < .001$). In summary, a positive correlation was found between four SOC dimensions and three PLC dimensions (see Table 3).

3.3. The prediction of perceived SOC from perceived PLC

Regression analysis on the prediction of perceived PLC at overall level from PLC was reported in Table 4. As displayed in Table 4, teachers' perceived SOC at overall level could be predicted significantly from any PLC dimension. At overall level, one PLC dimension, *structural condition*, seemed to be the strongest predictor of perceived SOC ($\beta=.26; p < .001$) but two dimensions, *human and social resources* ($\beta=.22; p=.001$) and *core element* ($\beta=.14; p < .05$) also had significant effects on perceived SOC. PLC dimensions explained 29% of variance in perceived SOC ($R=.53; R^2=.29$ and $F(3,378)=5.53; p < .001$).

Regression analysis on the prediction of perceived SOC at clan culture level from PLC was reported in Table 5. At clan culture level, the dimension of structural condition ($\beta=.23$; $p<.001$) seemed to be the strongest predictor of perceived SOC. Also, dimensions of core element ($\beta=.19$; $p<.01$) and human and social resources ($\beta=.22$; $p=.001$) had significant effects on perceived SOC. PLC dimensions explained 30% of variance in perceived SOC at clan culture level ($R=.54$; $R^2=.30$ and $F(3,378)=5.53$; $p<.001$).

Regression analysis on the prediction of perceived SOC at market culture level from PLC was reported in Table 6. At market culture level, one PLC dimension, human and social resources ($\beta=.25$; $p<.001$) seemed to be the best predictor of perceived SOC. Also, two dimensions, core element ($\beta=.19$; $p<.01$) and structural condition ($\beta=.19$; $p<.01$) had significant effects on perceived SOC. PLC dimensions explained 29% of variance in perceived SOC ($R=.54$; $R^2=.29$ and $F(3,378)=5.53$; $p<.001$).

Regression analysis on the prediction of perceived SOC at adhocracy culture level from PLC was reported in Table 7. At adhocracy culture level, the dimension of human and social resources ($\beta=.25$; $p<.001$) seemed to be the best predictor of perceived SOC. Also, structural condition ($\beta=.24$; $p<.001$) and core element ($\beta=.15$; $p<.01$) had significant effects on perceived SOC. PLC dimensions explained 31% of variance in perceived SOC ($R=.55$; $R^2=.31$ and $F(3,378)=5.53$; $p<.001$).

Regression analysis on the prediction of perceived SOC at hierarchical culture level from PLC was reported in Table 8. At hierarchical culture level, one PLC dimension, structural condition ($\beta=.26$; $p<.001$) seemed to be the strongest predictor of perceived SOC. Also, another two dimensions, human and social resources ($\beta=.20$; $p<.01$) and core element ($\beta=.13$; $p<.05$) had significant effects on perceived SOC. PLC dimensions explained 26% of variance in perceived SOC ($R=.51$; $R^2=.26$ and $F(3,378)=5.53$; $p<.001$).

In summary, teachers' perception of SOC could be predicted significantly from PLC. At three culture levels, *overall*, *clan*, *hierarchical*, the dimension of structural condition was the strongest predictor of perceived SOC. At two culture levels, market and *adhocracy*, the dimension of human and social resources was best predictor of perceived SOC.

4. Discussion

This study examined the relationship between teachers' perceptions on PLC and SOC and school levels. On the basis of the data analyzed, the present results suggested the following aspects of interest. First, perceived SOC and PLC were positive correlated. This first suggested PLC appear to play a role in teachers' reported levels of SOC. Next, this result provided initial evidence that the variation between schools in PLC may be explained by the SOC. Teacher perceived PLC was higher in the schools where SOC was higher. Conversely, where perceived PLC was lower, teachers perceived SOC was lower. This finding provided empirical data gained from Taiwan supported SOC and PLC mutually influence. Several studies indicated that continuous professional

development of teachers is regarded as crucial in improving the quality of education (Darling-Hammond, Chung, Alethea, Richardson, & Orphanos, 2009). Through PLC, teachers will broaden and deepen their professional knowledge and practicum experience; change beliefs, values, and perspectives; enhance faculty relationships (Nguyen, 2009). This might cause the change of SOC.

Second, significant differences were found between elementary school teachers and secondary school teachers in perceived PLC and SOC. The finding revealed elementary school teachers had higher level perception about supportive and shared leadership, shared values and vision, reflective dialogue, collective learning and application, supportive conditions, shared personal practice, and results orientation in their schools. Generally, secondary school teachers in Taiwan have more teaching loadings and feel unavailable to attend PLC. This might be the reason, that secondary school teachers perceived lower level in perceived PLC. Moreover, organization culture of the elementary school is different from that of secondary school in Taiwan. Organizational culture is defined as a set of norms, values, and beliefs is reflected in legends, rituals, symbols, and language (Daft, 1998). Indeed, secondary school teachers encounter with pressure to prepare their students to pass entrance examine in Taiwan. Almost all of secondary school teachers pay much attention on how to enhance their students' academic achievements. Higher percentage of passing entrance examination for students is regarded as an institution of mission. This reflected in teachers' norms, values, and beliefs and also reflected in school legends, rituals, symbols, and language. In contrast, elementary school teachers have more flexibility and autonomy in the curriculum design and instruction. This might be the reason, a significant difference between elementary school teachers and secondary school teachers in perceived SOC.

Third, teachers' perception of SOC could be predicted significantly from PLC. At *clan*, *hierarchical* culture levels, one PLC dimension, *structural condition*, was the best predictor of perceived SOC. Based on Cameron and Quinn (1999) definition, *clan* culture emphasizes values that are internal, flexible, concern for people and customers; and *hierarchy* culture stresses internal maintenance and control values. Although structural condition is an important factor for internalized connection and control, another two PLC dimensions, *core element* and *human and social resources*, also had significant effects on these culture levels. In contrast, at two culture levels, *adhocracy*, *market*, one PLC dimension, *human and social resources*, was the strongest predictor of perceived SOC. Based on Cameron and Quinn (1999) definition, *adhocracy* culture emphasizes an external orientation with a high degree of flexibility and individuality; and *market* culture stress values that are external with a need for stability and control. Human and social resources refer to a school's physical conditions and human capacities that encourage and sustain a collegial atmosphere and collective learning. It has much influence on external orientation, stability, and control. However, another two PLC dimensions, core element and structural condition also have significant effects on it. This result reconfirmed that PLC played an important factor to affect SOC.

5. Conclusion

Based on literature review, there is few research explored the relationships between PLC and SOC. Moreover, the CVF has been widely applied to studies of various organizational cultures but few studies used CVF as a framework to investigate SOC. Thus, the present study based on the concept of CVF measures a teacher's perception of SOC and examines the relationship between SOC and perceived PLC in Taiwan context. The results of present study indicated a positive correlation was found between SOC dimensions and PLC and PLC could predict SOC. The present study not only provided empirical data gained from Taiwan but also showed the important role of building a PLC in changing SOC. SOC as guiding operational principles have influences on individual and group patterns of behavior and thinking, which may eventually lead to necessary interventions to positively change the school environment and quality of education. Therefore, this present study suggests school principals should take the lead in creating a trusting atmosphere among teachers and restructuring schools as PLCs to provide support for teachers' collective learning and application, all of which will finally contribute to the improvement of school environment and change of school culture.

Table 1

t-test of school levels on dimensions of perceived SOC

Dimension	secondary(n=102)		elementary(n=280)		<i>t</i>
	M	SD	M	SD	
clan culture	3.57	.73	3.81	.65	-3.11**
market culture	3.44	.78	3.75	.70	-3.63***
adhocracy culture	3.76	.72	4.00	.62	-3.20**
hierarchical culture	3.53	.75	3.82	.58	-4.01***

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

Table 2

t-test of school levels on dimensions of perceived PLC

Dimension	secondary(n=102)		elementary(n=280)		<i>t</i>
	M	SD	M	SD	
core element	4.623	.762	4.896	.593	-3.69**
H & S resources	4.593	.757	4.929	.590	-4.54**
S conditions	4.789	.676	4.989	.562	-2.91**

** $p < .01$

Table 3

Pearson product-moment correlation between perceived PLC and School Organizational Culture (n=382)

<i>PLC</i>	Core element	Human and social resources	structural conditions	total
clan culture	.46***	.48***	.48***	.44***
market culture	.46***	.49***	.45***	.42***
adhocracy culture	.46***	.50***	.49***	.46***
hierarchical culture	.41***	.45***	.46***	.44***
total	.44***	.47***	.48***	.45***

*** $p < .001$

Table 4

Regression analysis on prediction of perceived SOC at overall level from dimensions of perceived PLC (N=382)

<i>PLC dimension</i>	<i>B</i>	Standard error	β	<i>t</i>	<i>p</i>	Zero-ordered <i>r</i>	Part <i>r</i>
constant	1.03	.24		4.35	.000		
core element	.13	.06	.14	2.20	.029	.44	.10
H and S resources	.20	.06	.22	3.39	.001	.47	.15
Structural condition	.27	.06	.26	4.41	.000	.48	.19

$R = 0.53, R^2 = 0.29$

$F(3,378)=5.53, p = 0.000$

$SOC = 1.03 + 0.13 \text{ core element} + 0.20 \text{ human and social resources} + 0.27 \text{ structural condition}$

Table 5

Regression analysis on prediction of perceived SOC at clan culture level from dimensions of perceived PLC

<i>PLC dimension</i>	<i>B</i>	Standard error	β	<i>t</i>	<i>p</i>	Zero-ordered <i>r</i>	Part <i>r</i>
constant	.47	.26		1.80	.074		
core element	.19	.06	.18	2.92	.004	.46	.13
human and social resources	.22	.07	.22	3.41	.001	.48	.15
structural condition	.26	.07	.23	3.95	.000	.48	.17

$R = 0.54, R^2 = 0.30$

$F(3,378) = 5.53, p = 0.000$

Clan culture level = .47 + 0.19 core element + 0.22 human and social resources + 0.26 structural condition

Table 6

Regression analysis on prediction of perceived SOC at market culture level from dimensions of perceived PLC

<i>PLC dimensions</i>	<i>B</i>	Standard error	β	<i>t</i>	<i>p</i>	Zero-ordered <i>r</i>	Part <i>r</i>
constant	.20	.29		.68	.495		
core element	.21	.07	.19	3.04	.003	.46	.13
human and social resources	.28	.07	.25	3.90	.000	.49	.17
structural condition	.23	.07	.19	3.14	.002	.45	.14

$R = 0.54, R^2 = 0.29$

$F(3,378) > 5.53, p = 0.000$

Market culture level = .20 + 0.21 core element + 0.28 human and social resources + 0.23 structural condition

Table 7

Regression analysis on prediction of perceived SOC at adhocracy culture level from dimensions of perceived PLC

<i>PLC dimensions</i>	<i>B</i>	Standard error	β	<i>t</i>	<i>p</i>	Zero-ordered <i>r</i>	Part <i>r</i>
constant	.73	.25		2.91	.004		
core element	.15	.06	.15	2.45	.015	.46	.11
human and social resources	.25	.06	.25	3.99	.000	.50	.17
structural condition	.26	.06	.24	4.06	.000	.49	.17

$R = 0.55, R^2 = 0.31$

$F(3,378) = 5.53, p = 0.000$

Adhocracy culture level = .73 + 0.15 core element + 0.25 human and social resources + 0.26 structural condition

Table 8

Regression analysis on prediction of perceived SOC at hierarchical culture level from dimensions of perceived PLC

<i>PLC dimensions</i>	<i>B</i>	Standard error	β	<i>t</i>	<i>p</i>	Zero-ordered <i>r</i>	Part <i>r</i>
constant	.82	.26		3.19	.002		
core element	.13	.06	.13	2.05	.041	.41	.09
human and social resources	.19	.06	.20	3.00	.003	.47	.13

structural condition	.28	.07	.26	4.35	.000	.46	.19
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$R = 0.51, R^2 = 0.26$

$F(3,378) = 5.53, p = 0.000$

Hierarchical culture level = .82 + 0.13 core element + 0.19 human and social resources + 0.28 structural condition

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