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Investigating the Relationship Between School Effectiveness, Professional Learning Communities, School Culture and Teacher Characteristics

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Abstract

This study aimed to determine the relationship between school culture (SC), professional learning communities (PLCs), and school effectiveness (SE) in the correlational research model through structural equation modeling. The sample of the study consisted of a total of 358 teachers working at public schools in various provinces of Turkey. Thus, data from a total of 355 teachers were analyzed. In the analysis of the data, the mediator and direct role of the variables were examined through path analysis. Finally, the fourth study hypothesis examined the relationship between these three variables and teacher characteristics. In general, the study results revealed that a supportive, achievement-oriented, and task-oriented SC was important for SE and the exhibiting of PLCs behaviors. In this context, it can be argued that paying attention to these cultural components and applications, which turn teachers into PLCs, is of significance in making schools effective. Teachers' perceptions of the PLCs, SC, and SE in a centrally managed educational system, and the relationships between these variables can contribute to school improvement.

Keywords: School Effectiveness, Professional Learning Communities, School Culture, Teacher Characteristics

Introduction

It has been observed that the concept of culture, which claimed to have been transferred from anthropology to organization studies (Van Houtte, 2005; Van Houtte & Van Maele, 2011), has attracted the attention of educational sociologists since the 1930s (Peterson & Deal, 2009). This concept was used by Pettigrew (1979) in organization research in the late 1970s. In the following process, this concept has been the focus of increased interest and has been the subject of many studies. It can be claimed that there is a similar trend in educational research. When one is establishing the definition of culture in the field of educational research, often, an anthropological approach is adopted, and culture is defined as the knowledge, beliefs, values, traditions, rituals, symbols, and language of a group—in short, the group's lifestyle (Hargreaves, 1995; Peterson & Deal, 2009). School culture (SC) is seen as an important factor affecting teachers' behaviors and attitudes as well as determining the norms of behavior in a school (Zhu, Devos & Li, 2011). It can be claimed that positive or negative behaviors exhibited in school emerge as a result of culture (Terzi, 2005). SC is a significant predictor of teachers' commitment to their school

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(Sezgin, 2010). SC also plays an important role in determining school dynamics and the change process (Hargreaves, 1995; Zhu et al., 2011; Korkmaz, 2006; Kosar & Calik, 2011). School culture should be analyzed before initiating a change process in a school (MacNeil et al., 2009). Therefore, SC has a critical function in developing positive behaviors in teachers and teachers' transformation into a professional learning community.

With the knowledge and skills obtained in pre-service training programs, a teacher cannot cope with the problems present in today's schools, which show multicultural diversity (Vanblaere & Devos, 2016). For this reason, today's teachers should continuously engage in collaborative learning activities. This forces teachers to become a professional learning community. In a professional learning community (PLC), individuals come together around common goals and transform their strengths into synergy. Although PLC is difficult to clearly define (Lomos, Hofman & Bosker, 2011), it is a concept that refers to a group of people who share their applications in a constant, reflective, collaborative, inclusive, and learning-oriented environment that encourages growth and allows for critical questioning (Stoll, Bolam, McMahon, Wallace & Thomas, 2006). It can be claimed that this concept, which was handled within the scope of peer solidarity and collaboration in the 1980s, was recognized as a professional community in 1995 and was widely accepted as a PLC after the 2000s (Lomos et al., 2011). DuFour, DuFour, and Eaker (2008) defined a PLC as a group of teachers who always make collective inquiries to achieve better results for the students they serve and commit to working together in the action research process. Therefore, it can be argued that the ultimate goal of transforming into a PLC is school effectiveness (SE).

It is also challenging to establish a simple and straightforward definition of SE. For example, handling SE only in terms of student achievement would be an incomplete reflection of this concept. Hoy and Ferguson (1985) addressed the difficulty involved in defining SE and argued that this concept should be handled to reflect multiple perspectives. In the literature on SE, this concept has been explained through its association with strong educational leadership, high student achievement expectations, an emphasis on basic skills, a safe and steady climate, and frequent assessment of student progress (Scheerens & Creemers, 1989). According to the researchers, the starting point in SE should be instructional effectiveness. It can also be claimed that a facilitating organization structure, academic optimism, an appropriate culture, and a healthy school climate are essential components of SE (Calik & Tepe, 2019; MacNeil, Prater, & Busch, 2009; Senel & Buluc, 2016; Yavuz Tabak, Sahin & Tabak, 2018).

Research Context

Turkey is a country situated between the East and Western societies. Although it has a deep-rooted history and educational heritage, it has transferred modern concepts such as professional learning community, school culture, school effectiveness from Western information sources to its system. Therefore, it is essential to examine such concepts thoroughly, taking into account the cultural context. The education system in Turkey is centrally structured. Therefore, mechanisms for transforming schools into learning communities are often centrally designed. Regular meetings held in schools and in-service training for teachers and other school members can be considered PLCs practices (Bellibas, Bulut & Gedik, 2017). However, these practices are not sufficient for compelling professional learning experiences. Dogan, Tatik, and Yurtsever (2017) stated that a clear understanding of what learning communities look like and how teachers in school work in this context in Turkish schools is a gap. Therefore, it is essential to examine the PLC in Turkey not only normatively but also in terms of its effects or consequences. In this study, school culture, school effectiveness, professional learning community, and some teacher characteristics were examined in mutual relations.

Theoretical Basis of the Study

This study investigated the concepts of SC, PLC, and SE. In the examination of SC, the positively correlated support, achievement, and task cultures of the SC scale developed by Terzi (2005) were taken

as a criterion. According to this criterion, the emphasis is placed on collaboration and trust in a supportive culture, achieving goals in an achievement culture, and work involving organizational goals in a task culture (Terzi, 2005). Similarly, in other studies using this scale, these three dimensions of culture were positively correlated (Ozdemir, 2012; Sezgin, 2010).

It is possible to talk about the five essential features of PLCs: (1) unification of community members around a shared vision and values, (2) common responsibility, (3) reflective professional inquiry, (4) cooperation, and (5) encouraging learning at the individual-group level (Stoll et al., 2006). Besides, Stoll et al. (2006) mentioned other PLCs features, such as mutual trust, respect, and support among members; inclusive membership beyond school administrators and teachers; and the establishment of openness, networks, and partnerships for new experiences. It can be suggested that a theoretical basis reflecting these basic features exists in the study. The dimensions of the Professional Learning Communities Assessment Scale developed by Olivier, Antoine, Cormier, Lewis, Minckler, and Stadalis (2009) and adapted to Turkish by Bellibas et al.(2017) were taken as criteria for this research: (1) shared and supportive leadership, (2) shared values and vision, (3) collective learning and practice, (4) shared individual practice, (5) supportive conditions-relationships, and (6) supportive conditions-structures.

SE is a versatile concept that includes a set of dynamics. When taken in terms of goals, it is possible to consider a school that realizes its organizational goals as effective. When a school is considered in terms of its system approach, the school that receives its inputs from its environment to maintain its organizational life is effective. By synthesizing these two approaches in their study, Hoy and Ferguson (1985) defined an effective school as one that establishes healthy communication with its environment and obtains the resources it needs to realize its organizational goals. That is characteristic of an open system. In this study, SE was investigated in terms of the system approach and the school's aims.

The Relationship Between SC and PLC

SC affects teachers' relationships with each other, parents, students, and school administrators (Terzi, 2005). A school's culture determines what is important and remarkable in that school (Peterson & Deal, 2009). School development initiatives that do not take SC into account are likely to fail because culture affects change readiness (Stoll et al., 2006). SC's importance is undeniable in transforming the school into a PLC, as culture is a concept that depends on a shared understanding and shared value systems. Hofman and Dijsktra (2010) linked the success of teacher networks (a PLC can also be included in this network) to structural, cultural, and situational perspectives. Additionally, teachers need to exhibit PLC behaviors in terms of SC. Carpenter (2005) emphasized that collaboration networks established among teachers were necessary for SC and collective achievement.

H1: PLC behaviors are more common in the task and achievement-oriented SC that has support.

The Relationship Between SC and SE

It can be argued that SC is an essential factor in SE. The Hawthorne Research, launched in the 1930s, revealed the importance of group norms/values and social interaction—in other words, culture—in organizations' functioning (Van Houtte, 2005). According to Peterson and Deal (2009), positive SC increases its effectiveness and efficiency. Cheng's (1993) study highlighted the importance of SC on SE. Hargreaves (1995) found it necessary to examine culture as a variable in SE studies. Because one of SE's main components is student achievement, it can be claimed that there is a significant relationship between SC and SE. Gaziel (1997) found that SC was an essential factor in explaining student achievement. Watson (2001) claimed that student achievement could be damaged in a school where SC was not suitable for learning. Demirtas (2010) revealed that in an SC that included teacher collaboration, student achievement was high.

H2: The level of school effectiveness is higher in the task- and achievement-oriented SC with support.

The Relationship Between PLC and SE

Continuous teacher learning is at the core of PLC (Hofman & Dijsktra, 2010). For professional development continuity, teachers should observe each other and share their professional experiences (Boyle, Lamprianou, & Boyle, 2005). SE increases with the transformation of teachers into a PLC (Sigurðardóttir, 2010). The development of the school and student achievement is positively correlated with the level of teachers' transformation into a PLC (Hofman & Dijsktra, 2010; Lomos et al., 2011; Louis & Marks, 1998). An essential feature of a PLC is that teachers focus on typical responsibilities for student achievement (Louis, 2006). One of the main objectives of a PLC is to enable teachers to boost their effectiveness as professionals for students' ultimate benefit (Stoll et al., 2006).

H3: School effectiveness level is higher in schools with high PLC behaviors.

The Relationship Between Teacher-Related Variables and SC, PLC, and SE

Teachers' characteristics—such as age, gender, professional seniority, and education level—can be partially effective on SC, PLC, and SE. Shaw and Reyes (1992) did not determine any significant relationship between culture and teachers' demographic characteristics. Sahin (2010) found no significant difference in the SC perception of teachers according to their age and branch. In another study, Sahin (2004) determined that the level of education of school administrators made a significant difference in those administrators' perceptions of SC, although there was no difference in teachers. In the same study, the perception of positive SC was observed to be higher in female teachers. When teacher characteristics are handled in terms of the professional community aspect, it is claimed that teachers with higher professional seniority—and especially those who have reached the last stages of their careers—show fewer PLC behaviors (Vanblaere & Davos, 2016). When teacher characteristics are analyzed in SE's context, these features were observed to be related to effectiveness in the study of Sachs (2004). However, Kyriakides (2004) did not find a significant relationship between SE and demographic variables.

H4: Age, education level, and professional seniority are partly effective on teachers' perceptions of SC, PLC, and SE.

Method

Research Design

This study aimed to test the relationship between SC, PLC, and SE in the correlational research model through structural equation modeling. Correlational studies aim to determine the relationship between two or more variables (Creswell, 2012). They can also determine whether the variables affect each other and the relationship between the degrees of change. However, testing the relationship between variables in structural modeling requires a strong theoretical background. In this way, a reality that exists theoretically can be revealed empirically (Fraenkel, Wallen & Hyun, 2012).

Study Group

The study data were collected from 355 teachers from various Turkey provinces (Ankara, Istanbul, Aksaray, Van, Samsun). Among the participants, 226 (64 %) were female, and 129 (36 %) were male. The teachers' ages ranged between 22 and 49 (m=32.13), while their professional seniority varied from 1 to 23 years (m= 9.47 years). Most of the participants are branch teachers and have an undergraduate degree.

Table 1. Demographic characteristics of research participants

Demographic variable		*f*	%
Gender	Male	129	36
	Female	226	64
Seniority (year)	1-9	233	65.5
	10-19	57	16.1
	20-29	29	8.2
	30-45	36	10.2
Teaching level	pre-school teacher	77	21.8
	classroom teacher	55	15.4
	branch teacher	223	62.8
Educational level	undergraduate	311	87.7
	master	34	9.5
	doctorate	10	2.8

In the context of the research, it is thought that an explanation will be given to the model by affecting SC, PLCs, and SE. In line with the research hypotheses, the teacher demographic characteristics were obtained during the data collection process. Since this research was conducted with a teacher-focused focus rather than directly obtaining school and macro-level results, it was focused on individual demographic characteristics.

Data Collection Tools

In line with the study's purpose, the data collection tools included the SC Scale, the PLC Assessment Scale, the SE Scale, and a Personal Information Form.

The SC Scale

The "School Culture Scale", which Terzi (2005) developed, consists of 29 items and four factors: support culture, achievement culture, bureaucratic culture, and task culture. However, because the error variance related to the bureaucratic culture sub-dimension was found to be 0.95, this variable was not addressed in the structural equation model established within the study's scope. Accordingly, two confirmatory factor analysis (CFA) levels were performed using the LISREL 8.8 software package to determine the construct validity of the three-factor SC Scale. As a result of the CFA, the scale's fit indices were $X^2/sd = 3.17$, RMSEA = 0.069, and SRMR = 0.072. The value of p was obtained in the significance test for the RMSA value was 0.000. As compared to the criterion values, the RMSEA and SRMR values indicated a good fit, as they were less than 0.080, while the result of the RMSEA-based significance test was also significant (Kline, 2016, pp. 277-290). When the X^2/sd value was examined according to Carmines and McIver (1981), the model-data fit could be regarded as good, as it was less than 5 (cited in Bollen, 1989, p. 278). Other fit indices were determined as CFI = 0.96, NFI = 0.95, and NNFI = 0.96. When these fit indices were compared to the criterion values, they were found to indicate a perfect fit, as they were ≥0.95 (Kline, 2016, p. 277). Also, NFI and NNFI values showed a perfect model-data fit, as they were ≥0.95 (Hu & Bentler, 1999). In light of the evaluation of all these fit indices, the measurements obtained with the three-dimensional and 20-item SC scale can be said to achieve the model data fit at a good level. Apart from this, considering the reliability of measurements obtained with the three-factor SC scale, the Cronbach's alpha coefficient was found to be 0.894. According to Nunnaly and Bernstein (1994), the measurements obtained with the SC scale could be said to be reliable, as this value was greater than 0.70.

The PLC Assessment Scale

The PLC Assessment Scale, which Olivier et al. (2009) developed and adapted to Turkish by Bellibas et al. (2017), consists of six factors and 52 items. These sub-dimensions are shared and supportive leadership, shared values and vision, collective learning and practice, shared individual practice, supportive conditions-relationships, and supportive conditions-structures. The construct validity for testing the validity of the measurements obtained through the PLC Assessment Scale was conducted with DFA. As a result of the analysis conducted using the LISREL 8.8 software package, the fit indices were found to be as follows: RMSEA = 0.059 ($p < 0.05$), $X^2/sd = 2.57$, SRMR = 0.050, CFI = 0.99, NFI = 0.98, and NNFI = 0.98. The RMSEA value was found to be ≤0.08, which indicated a good fit (Browne & Cudeck, 1993, p. 144). The X^2/sd value was ≤3 (Carmines & McIver 1981; cited in Bollen, 1989, p. 278), the SRMR value was ≤0.05, and the CFI, NFI, and NNFI values were ≥0.95 (Bryne, 2011, p. 76; Kline, 2016, p. 277; Hu & Bentler, 1999), which indicated a perfect fit. To that end, as a result of a two-level CFA performed for the validity of the measurements, the model can be said to fit the data perfectly. Furthermore, Cronbach's alpha coefficient was calculated to examine the measurements' reliability and was found to be 0.978. According to Nunnaly and Bernstein (1994), the measurements obtained through the PLC Assessment Scale could be said to be reliable because this value was greater than 0.70.

The SE Scale

The School Effectiveness Scale, which Hoy (2009) developed and adapted to the Turkish culture by Senel (2015), is a single-factor scale consisting of eight items. Confirmatory factor analysis to examine the validity of the measurements obtained with this scale was performed using the LISREL 8.8 software package. As a result of the analysis, the RMSEA value was found to be 0.052. This value indicated a good fit, as it was less than 0.080 (Browne & Cudeck, 1993, p. 144). Other fit indices were found to be $X^2/sd = 2.22$, SRMR = 0.027, CFI = 0.99, NFI = 0.99, and NNFI = 0.99. Of these values, X^2/sd was less than 3 (Carmines & McIver 1981; cited in Bollen, 1989, p. 278), the SRMR value was less than 0.05, and the CFI, NFI, and NNFI values were greater than 0.95, which indicated a perfect fit (Bryne, 2011, p. 76; Kline, 2016, p. 277; Hu & Bentler, 1999). Based on all this, the model could be said to fit the data perfectly for the SE scale, and the measurements were found to be valid. Additionally, to determine the measurements' reliability, the Cronbach's alpha coefficient was calculated and found to be 0.906. As this value was higher than 0.70, the measurements obtained using the SE scale were considered reliable (Nunnally & Bernstein, 1994).

Personal Information Form

Within the scope of the study, the researchers developed a Personal Information Form to collect demographic information. The form gathered data about gender, age, professional seniority, the branch of study, and education level.

Application and Analysis Processes

The application of the scales was carried out on the online platform. For this reason, reliable electronic scale application platforms were searched, and an application was preferred. In this way, the data collection process served both the economics of the research and the data collection process's reliability. An online survey has provided convenience for the researchers in collecting data and reaching the data analysis stage. On the other hand, the formation of a data set that can be analyzed directly, especially the absence of missing data, has also contributed to its reliability. In applying the scales, the research instructions were presented to the participants, and the statement of research ethics was

explained. The section containing the scale items used in the research and the section containing the information that the participants can reach the researchers are ended.

Before the analysis, the study data were examined to determine whether they provided necessary assumptions for structural equation modeling and other tests. Firstly, z scores were checked to find outliers in the data. At this stage, the data from three teachers were removed, as they were found to be outliers, and a data set obtained from 355 teachers was analyzed. Also, to test the normality of the distribution, skewness and kurtosis indices were examined for the data of 355 participants regarding the total scores of the scale. These values were found to vary between -1.5 and + 1.5. Thus, the data could be said to have a normal distribution (Tabachnick & Fidell, 2013). The Variance Inflation Factor (VIF) and Durbin Watson values of 355 data forms were analyzed to determine multicollinearity problems. The analysis revealed that none of the VIF values was greater than 10 and that the Durbin Watson value was in the specified range. In the data analysis, the relationships between SC, PLC, and SE were examined using Pearson's Product Moment Correlation, while the mediator and direct roles of the variables were analyzed using path analysis. Correlations and descriptive statistics were calculated using the SPSS 21 software package, while Confirmatory Analysis and Structural Analysis were performed using the LISREL 8.8 software package. The model's goodness of fit was evaluated considering fit indices such as the chi-square, $\chi 2/df$, Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Tucker Lewis Index (TLI) (Schermelleh-Engel, Moosbrugger & Muller, 2003) and was found to be appropriate.

Results

Descriptive statistics related to the variables examined in line with the study's purpose and the relationships between these variables were calculated according to Pearson's correlation coefficient. The results are given in Table 2.

Table 2. Descriptive statistics and correlations between the variables

		Mean	SD	R											
				1	2	3	4	5	6	7	8	9	10	11	12
1. Total	SchoolCu-	76.1	11.93	-											
2. Total	Professi-	154.87	30.12	0.74*	-										
3. Total	SchoolEf-	28.75	6.05	0.62*	0.77*	-									
4. SC	SchoolCu-	29.42	6.11	0.93*	0.74*	0.60*	-								
5. AC	SchoolCu-	22.84	4.41	0.89*	0.67*	0.54*	0.79*	-							
6. TC	SchoolCu-	23.84	3.62	0.65*	0.38*	0.37*	0.40*	0.38*	-						
7. SSL	Professi-	32.96	6.85	0.71*	0.87*	0.67*	0.72*	0.67*	0.32*	-					
8. SVV	Professi-	27.31	5.70	0.69*	0.92*	0.71*	0.67*	0.63*	0.39*	0.81*	-				
9. CLP	Professi-	30.13	6.41	0.65*	0.93*	0.72*	0.65*	0.56*	0.35*	0.72*	0.85*	-			
10. SIP	Professi-	20.68	4.65	0.61*	0.87*	0.65*	0.61*	0.54*	0.32*	0.65*	0.72*	0.82*	-		
11. SCR	Professi-	15.21	3.11	0.69*	0.89*	0.70*	0.69*	0.62*	0.37*	0.71*	0.77*	0.82*	0.82*	-	
12. SCS	Professi-	28.58	6.91	0.64*	0.90*	0.71*	0.65*	0.58*	0.32	0.69*	0.76*	0.78*	0.77*	0.78*	-

*p<0,01

Note: SchoolCu-Total = Total score for School Culture; Professi-Total = Total score for Professional Learning Communities; SchoolEf-Total = Total score for School Effectiveness; SchoolCu-SC = Score for Support Culture; SchoolCu-AC = Score for Achievement Culture; SchoolCu-TC = Score for Task Culture; Professi-SSL = Score for Shared and Supportive Leadership; Professi-SVV = Score for Shared Values and Vision; Professi-CLP = Score for Collective Learning and Practice;

Professi-SIP = Score for Shared Individual Practice; Professi-SCR = Score for Supportive Conditions-Relationships; and Professi-SCS = Score for Supportive Conditions-Structures

As seen in Table 2, correlations between all variables were found to be significant. The relationship between all variables handled in the study was observed to be positive. Also, all correlation coefficients were found to be greater than 0.30. When the School Culture Scale was examined, the support culture dimension was found to have the highest correlation, with 0.93 ($p < 0.01$), while the highest correlation for the PLC Assessment Scale was obtained from the collective learning and practice sub-dimension, with 0.93 ($p<0.01$). The lowest correlations of these two scales with their sub-dimensions were obtained from the task culture sub-dimension (0.65, $p < 0.01$) and the shared and supportive leadership and shared individual practice sub-dimensions (0.87, $p < 0.01$), respectively. The structural equation model created in line with the purpose of the study is given in Figure 1.

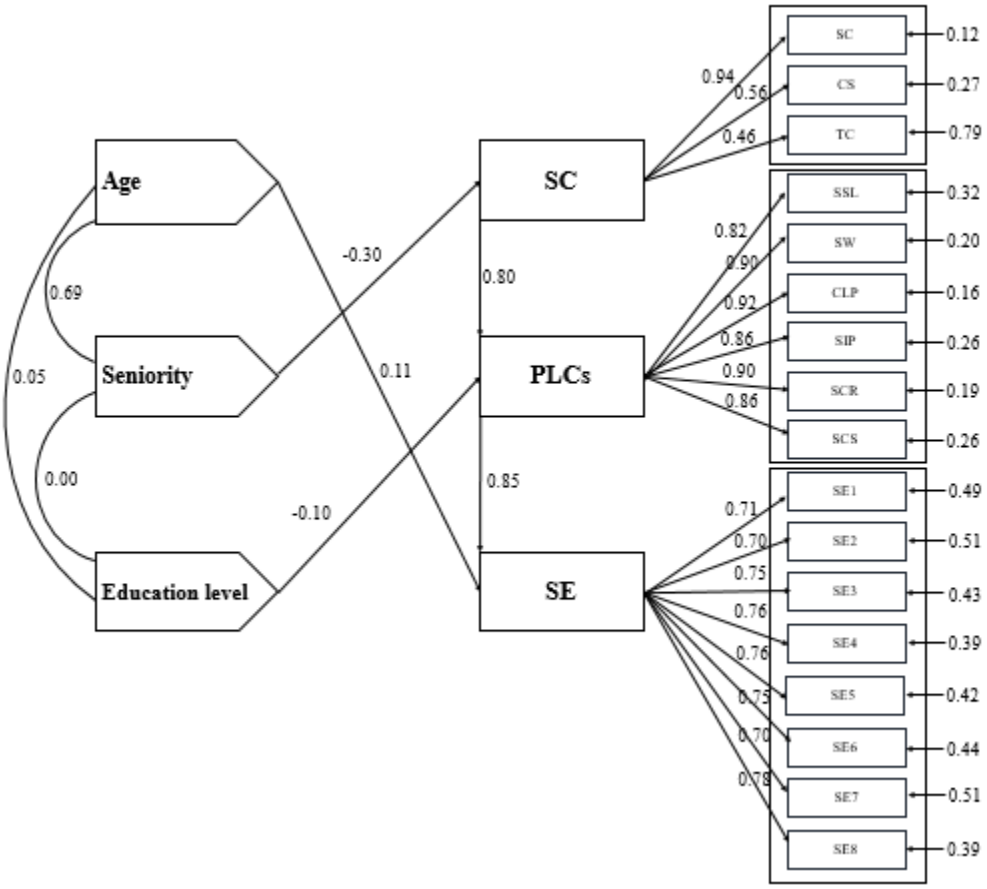

Figure 1. The Structural Equation Model (Standard Solutions)

The structural equation model given in Figure 1 included the observed variables such as age (AGE), seniority (SENIORITY), and education level (EDULEVEL) and the latent variables such as school culture (SchoolCu), professional learning communities (Professi), and school effectiveness (SchoolEf). It also included three sub-dimensions of SC and six sub-dimensions of PLC. On the other hand, the model consists of the items in the SE scale. When the sub-dimensions of the latent variable SC in Figure 1 are examined, all the path coefficients related to the support culture (SC), the achievement

culture (AC), and the task culture (TC) were observed to be greater than 0.30, while all the residual variance values were found to be less than 0.90. Therefore, all these sub-dimensions were included in the model. The highest path coefficient for the sub-dimensions of the SC variable belonged to the support culture (SC), with 0.94. On the other hand, the lowest path coefficient for this variable belonged to the task culture, with 0.46. The sub-dimensions of the PLC in the model were shared and supportive leadership (SSL), shared values and vision (SVV), collective learning and practice (CLP), shared individual practice (SIP), supportive conditions-relationships (SCR), and supportive conditions-structures (SCS). The path coefficients for these sub-dimensions ranged from 0.82 to 0.92, while their residual variances ranged from 0.16 to 0.32. In other words, while all coefficients were greater than 0.30, the latent variance values were greater than 0.90. The highest path coefficient belonged to the CLP sub-dimension, while the lowest was the coefficient of the SSL sub-dimension. Apart from the coefficients related to the sub-dimensions, the fit indices of the model given in Figure 1 were examined. The fit indices related to the established model were found to be significant and it was observed that the model confirmed itself.

Table 3. Fit index values and fit levels for the model

Fit indices	Fit index values	Level of fit
RMSEA	0.070	Good fit (≤0.08)[1]
p value (RMSEA)	0.00	Significant (p<0.05)
X^2/SD	3.21	Good fit (≤5)[2]
SRMR	0.045	Perfect fit (≤0.05)[3]
CFI	0.98	Perfect fit (≥0.95)[1]
NFI	0.97	Perfect fit (≥0.95)[4]
NNFI(TLI)	0.98	Perfect fit (≥0.95)[4]

[1]Kline (2016); [2] Carmines and McIver (1981) (cited in Bollen, 1989);[3] Bryne (2011);[4] Hu and Bentler (1999)

As seen in Table 3, all the path coefficients in the model were significant. The path coefficient values indicated that the best predictor of SE was the PLC variable. The path coefficient for this path was found to be 0.85—a value that indicated a big effect, as it was greater than 0.50. The path coefficient for the age variable, which is another predictor of SE, was found to be 0.11. Although this value had a small effect, with a value of 0.10, it was a significant path coefficient. Also, the determination coefficient for SE was examined in R2. R2 was observed to be 0.70 for the SE variable. In other words, age and PLC variables, which were the predictors of the SE variable, could be said to explain 70% of the variance in SE.

Table 4. Path coefficients, their significance, and impact levels regarding the variables in the model

Paths in the model	Path coefficients	Significance of T-values related to path coefficients	Level of effect
Age →SE	0.11	p<0.05	Small Effect
Seniority →SC	-0.30	p<0.05	Medium Effect
Education level→PLC	-0.10	p<0.05	Small Effect
SC→PLC	0.80	p<0.05	Big Effect
PLC→SE	0.85	p<0.05	Big Effect

When the PLC variable, which was another predicted variable in the model, was examined in Table 4, the best predictor of this variable was the SC variable. The path coefficient between SC and PLC was 0.80—a value that had a significant effect, as it was ≥0.50. Accordingly, the SC variable was a strong

predictor of the PLC variable. Another predictor of the PLC variable was the education level variable. The path coefficient for education level was -0.10. This coefficient was an indicator that level of education had a small effect on the PLC variable. However, as the coefficient was observed to be significant, it was included in the model. Also, the fact that this coefficient was negative indicated that as the level of education increased, the PLC assessment scale scores generally decreased. Finally, when the explained variance related to the PLC variable was examined, it was observed to be $R^2 = 0.64$. In other words, it could be said that SC and education level, which are the predictors of the PLC variable, explain 64% of the variance in the PLC variable.

When Table 4 was analyzed, the path coefficient belonging to the seniority variable, which was the only predictor variable for the SC variable, was found to be -0.30. This coefficient indicated that seniority had a medium effect on the SC variable. Moreover, the fact that the coefficient was negative indicated that the SC scale score generally decreased as seniority increased.

Discussion

In the study, four hypotheses were tested. In the first hypothesis of the study, the relationship and effect between SC and PLC were investigated. Secondly and thirdly, the relationship and effect between SC and SE and between PLC and SE were tested, respectively. The fourth hypothesis examined the relationship between these three variables and demographic variables.

In the study, PLC behaviors were more common among teachers in achievement-oriented and task-oriented schools that have support. Structural equation analysis revealed that these two variables had a statistically large effect. This result confirmed the hypothesis of the study (H1). When the results were analyzed in the context of the sub-dimensions of culture, the support culture was found to have a high level of positive correlation with PLC, the achievement culture had close to a high level of positive correlation with PLC, and the task culture had a moderate level of positive correlation with PLC. It can be argued that in a school in which teachers become PLCs, trust-based relationships will increase, and an environment that is suitable for the generation of new ideas will be created (Lieberman, 2000), which will lead to success in school. However, it can be misleading to seek the trust required for a PLC only in the relationships between teachers. Carpenter (2015) argued that trust toward the school principal is also effective in transforming teachers into a PLC.

According to the study results, achievement and task-oriented SC that has support were found to have a high and positive correlation with school effectiveness. However, when the effect between the two variables was examined through path analysis, no similarly significant results were obtained. These results partly confirmed the hypothesis of the study (H2). When the results were examined in the context of SC's sub-dimensions, the supportive culture was observed to be associated with SE at a higher level, which was followed by the achievement and task cultures, respectively. This result was consistent with the work of Ali (2017) and Gaziel (1997). Ali (2017) also found a high level of relationship between SC and SE. According to Gaziel's (1997) study, effective schools assign more importance to academic achievement, continuous school development, and organization, respectively, whereas these values emerge as an organization, teamwork, and academic achievement in average schools. According to the researcher, this difference in value ranking is associated with SC, and this difference in value ranking creates high academic achievement. Similarly, MacNeil et al. (2009) found that students earned higher scores on standardized tests in schools with healthy learning environments.

According to the study results, the perception of SE was also high in schools in which PLC behaviors were high among teachers. Structural equation analysis revealed a big effect between the PLC and SE perceptions of teachers. This result confirmed the hypothesis of the study (H3). It was also consistent with the results of Sigurðardóttir (2010). According to Liberman (2000), an organization whose members try to create and maintain a group to develop their professional identities, interests, and learning will gain great power and energy. In their meta-analysis study of PLC and student achievement, Lomos et al. (2011) found a statistically significant positive effect value between these two variables. According to

Carpenter's (2015) study, for PLCs to be effective and schools to achieve their goals, school administrators should engage in leadership that encourages effective collaboration and is supportive and shared. Additionally, they should not engage teachers in meaningless work.

The teacher characteristics handled in this study were age, education level, and professional seniority. In the study, there was a positive and low-level effect between SE and the age of teachers, a negative and medium-level effect between SC and the professional seniority of teachers, and a negative and low-level effect between PLC and the education level of teachers. These results showed that the perception of SE was higher in older-aged teachers. With an increase in professional seniority, their support-, achievement-, and task-oriented perception of SC decreased, and that with an increase in teachers' education level, their tendency to make up a professional community decreased. The study hypothesis was partly supported because no significant effect of each demographic variable on the study variables was observed. The relationship determined between SC and teacher age was partially consistent with Sahin's (2004) study. In Sahin's study, the perception of positive SC was observed to be high among young teachers. In the study, teachers' age was expected to be correlated to PLC because studies on this topic were observed to reveal findings supporting this expectation (Vanblaere & Davos, 2016). As teachers' professional experience grows, they may be less willing to change their teaching practices (Day & Sachs, 2004). However, the study found no results that met these expectations. The age of teachers ranging between 22 and 49 was thought to be effective with respect to this result because this age range covers the first and middle periods of a teacher's career. Although Shaw and Reyes's (1992) study did not find a significant relationship between organizational culture and teachers' personal characteristics such as age, gender, or professional experience, a negative relationship was found between age and SC in this study, which was a remarkable result.

In general, the study results revealed that a supportive, achievement-oriented, and task-oriented school culture and the displaying of PLC behaviors were important for SE. In this context, it can be argued that these cultural components and practices that turn teachers into a PLC are essential in making schools effective. A healthy SC motivates teachers, and highly motivated teachers are considered necessary to increase student achievement (MacNeil et al., 2009). However, despite these results, it is vital not to ignore Hattie's (2008) study, which is a synthesis of many studies. According to the researcher, when professional development initiatives are part of comprehensive education reforms, they have lower implications when they manifest as "top-down" innovations. For this reason, trying to see the more bureaucratically organized school as a flexible organization that is not surrounded by certain borders (Lieberman, 2005) may make it more open to change and development. Also, long-term planning of professional development programs implemented in school is important in the context of teachers' transformation into a PLC and establishing an effective school. Boyle et al. (2005) revealed that teachers who participated in long-term professional development programs improved their teaching practices in many ways. Although teachers, as members of a PLC, were the subject of investigation in this study and have been the subjects of many studies in the relevant literature, PLC also requires other school members' involvement in the process (Stoll et al., 2006). Another limitation of this research is that it investigates the culture, which is handled quantitatively through an ethnographic approach. Hargreaves (1995) stated that this was difficult yet possible through the development of effective SC models. In this study, school and class size variables, school resources, and family involvement in school processes were not examined as components. However, in the relevant literature, these variables are reported as important factors in explaining SE (Rutter & Maughan, 2002; Stoll et al., 2006). It is essential to consider these limitations in future research.

Strengths and Limitations

This study aimed to test four hypotheses using three scales. Accordingly, the hypotheses statistically confirmed themselves in theoretical and structural contexts, which can be considered proof of the study's strength. The fact that the results obtained have theoretical counterparts and have been analyzed has made it possible to systemize the featured views based on the theoretical discipline. On the

other hand, the study group's characteristics and the results obtained allow for certain generalizability, though this cannot be extended to Turkey's entirety. A limitation of this study was that the data were collected from certain cities in Turkey. Therefore, the primary focus was on verifying SE's construct with SC, PLC, and teachers' characteristics. Effective schools may depend on many variables such as cultural variables in particular, and human factor variables sociologically. The generalizability of the findings and results obtained within the study's scope should be interpreted by considering other factors—including, especially, cultural factors.

Conclusion

The results showed that the teachers found their school cultures more supportive, and they gave high scores to collective learning and practices in terms of PLCs. The research also showed that school culture was a significant predictor of the PLCs and the PLCs significantly predict school effectiveness. The results showed that the perception of school effectiveness was higher among older teachers. Strikingly, a significant negative relationship was found between PLCs and teachers' education level.

From a global perspective, the main output of education systems emerges as student achievement. However, the increase in student success is basically explained by the effectiveness of schools and in-school variables. At this point, the importance of learning organizations in creating innovative learning environments emerges (Kools et al., 2020). In this way, it is claimed that SC's current learning environments and styles will positively affect SE (OECD; 2012; 2017). Our results support these claims. When we evaluate the results on a national scale, it may be suggested to establish or develop mechanisms that allow local interventions in the education system instead of strict central practices to allow innovative practices.

The 2019-2023 Strategic Plan of the Ministry of National Education (MoNE, 2019) prioritizes the issues such as empowering employees and their active participation in decision-making processes; organizational learning, information sharing, and inter-unit coordination; and stakeholder management strategy. Therefore, it is expected that the research results will contribute to the achievement of these goals. It is necessary to focus on organizational culture, professional learning community, and teacher characteristics to create effective schools, and the research sheds light on these issues.

References

Ali, N. (2017). Teachers' perceptions of the relationship between principals' instructional leadership, school culture, and school effectiveness in Pakistan. *Education and Science, 42*(192), 407-425. DOI: 10.15390/EB.2017.7088

Bellibas, M. S., Bulut, O., & Gedik, S. (2017). Investigating professional learning communities in Turkish schools: the effects of contextual factors. *Professional Development in Education, 43*(3), 353-374. https://doi.org/10.1080/19415257.2016.1182937

Bollen, K. A. (1989): *Structural Equations with Latent Variables*. New York: John Wiley & Sons.

Boyle, B., Lamprianou, I., & Boyle, T. (2005). A longitudinal study of teacher change: What makes professional development effective? Report of the second year of the study. *School Effectiveness and School Improvement, 16*(1), 1-27. https://doi.org/10.1080/09243450500114819

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen and J. S. Long (Eds.), Testing structural equation models (pp. 136-162). Newbury Park, CA: Sage.

Byrne, B. M. (2011). *Structural equation modeling with Mplus: Basic concepts, applications, and programming*. Routledge.

Calik, T., & Tepe, N. (2019). The relationship between school effectiveness and enabling school structure and academic optimism according to the middle school teachers perceptions. *Kastamonu Education Journal, 27*(4), 1471-1480. doi:10.24106/kefdergi.3008

Carpenter, D. (2015). School culture and leadership of professional learning communities. *International Journal of Educational Management, 29*(5), 682-694. https://doi.org/10.1108/IJEM-04-2014-0046

Cheng, Y. C. (1993). Profiles of organizational culture and effective schools. School *Effectiveness and School Improvement, 4*(2), 85-110. https://doi.org/10.1080/0924345930040201

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Boston: Pearson.

Day, C., & Sachs, J. (2004). Professionalism, performativity and empowerment: Discourses in the politics, policies and purposes of continuing professional development. In C. Day &J. Sachs (Eds.), *International handbook on the continuing professional development of teachers* (pp. 3–32). Berkshire, UK: Open University Press.

Demirtas, Z. (2010). The relationship between school culture and student achievement. *Education and Science, 35*(158), 3-13.

Dogan, S., Tatik, R. S., & Yurtseven, N. (2017). Professional learning communities assessment: Adaptation, internal validity, and multidimensional model testing in turkish context. *Educational Sciences: Theory and Practice, 17*(4), 1203-1229. https://doi.org/10.12738/estp.2017.4.0479

DuFour, R., DuFour, R., & Eaker, R. (2008).*Revisiting professional learning communities: New insights for improving schools*.Bloomington, IN: Solution Tree.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to Design and Evaluate Research in Education* (8th edt.). New York: McGram-Hill Companies.

Gaziel, H. H. (1997). Impact of school culture on effectiveness of secondary schools with disadvantaged students. *The Journal of Educational Research, 90*(5), 310-318. https://doi.org/10.1080/00220671.1997.10544587

Hargreaves, D. H. (1995). School culture, school effectiveness and school improvement. *School Effectiveness and School Improvement, 6*(1), 23-46. https://doi.org/10.1080/0924345950060102

Hattie, J. (2008). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge.

Hofman, R. H., & Dijkstra, B. J. (2010). Effective teacher professionalization in networks?. *Teaching and Teacher Education, 26*(4), 1031-1040. https://doi.org/10.1016/j.tate.2009.10.046

Hoy, W. K., & Ferguson, J. (1985). A theoretical framework and exploration of organizational effectiveness of schools. *Educational Administration Quarterly, 21*(2), 117-134. https://doi.org/10.1177/0013161X85021002006

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1-55.

Kline, R. B. (2016). *Principles and Practice of Structural Equation Modeling* (Fourth Edition). New York: Guilford Press.

Kools, M., Stoll, L., George, B., Steijn, B., Bekkers, V., & Gouëdard, P. (2020). The school as a learning organisation: The concept and its measurement. *European Journal of Education, 55*(1), 24-42. https://doi.org/10.1111/ejed.12383

Korkmaz, M. (2006). The relationship between organizational health and robust school vision in elementary schools. *Educational Research Quarterly, 30*(1), 14-36.

Kosar, S., & Calik, T. (2011). The relationship between primary school administrators' styles of using power in management and organizational culture. *Educational Administration: Theory and Practice, 17*(4), 581-603.

Kyriakides, L. (2004). Differential school effectiveness in relation to sex and social class: Some implications for policy evaluation. *Educational Research and Evaluation, 10*(2), 141-161. https://doi.org/10.1076/edre.10.2.141.27907

Lieberman, A. (2000). Networks as learning communities: Shaping the future of teacher development. *Journal of Teacher Education, 51*(3), 221-227. https://doi.org/10.1177/0022487100051003010

Lomos, C., Hofman, R. H., & Bosker, R. J. (2011). Professional communities and student achievement–a meta-analysis. *School Effectiveness and School Improvement, 22*(2), 121-148. https://doi.org/10.1080/09243453.2010.550467

Louis, K. S. (2006). Changing the culture of schools: Professional community, organizational learning, and trust. *Journal of School Leadership, 16*(5), 477–489. https://doi.org/10.1177/105268460601600502

Louis, K.S. & Marks, H. (1998). Does professional community affect the classroom? Teachers' work and student experience in restructured schools. *American Journal of Education 106*(4), 532–575. https://doi.org/10.1086/444197

MacNeil, A. J., Prater, D. L., & Busch, S. (2009). The effects of school culture and climate on student achievement. International Journal of leadership in Education, 12(1), 73-84. https://doi.org/10.1080/13603120701576241

MoNE. (2019). *The 2019-2023 Strategic Plan of the Ministry of National Education*. http://sgb.meb.gov.tr/www/dokumanlar/icerik/30

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw.OECD (2012). *How Your School Compares Internationally: OECD Test for Schools (based on PISA) Pilot Trial*. Paris: OECD Publishing.

OECD (2017). *The OECD Handbook for Innovative Learning Environments. Paris: OECD Publishing*. http://dx.doi.org/9789264277274-en.

Olivier, D. F., Antoine, S., Cormier, R., Lewis, V., Minckler, C., & Stadalis, M. (2009, March). Assessing schools as professional learning communities symposium. In annual meeting of the Louisiana Education Research Association, Lafayette. Retrieved from http://ullresearch. pbworks. com/f/Olivier_Assessing_PLCs_Symposium _-_PLCA-R_Introduction. pdf.

Ozdemir, S. (2012). The relationship between school culture and organizational health in primary schools. *Educational Administration: Theory and Practice, 4*(4), 599-620.

Peterson, K. D., & Deal, T. E. (2009). *The shaping school culture fieldbook* (Second Edition). San Francisco, CA: Jossey-Bass.

Pettigrew, A. (1979). On studying organisational cultures. *Administrative Science Quarterly, 24*(4), 570–581.

Rutter, M., & Maughan, B. (2002). School effectiveness findings 1979–2002. *Journal of School Psychology, 40*(6), 451-475. https://doi.org/10.1016/S0022-4405(02)00124-3

Sachs, S. K. (2004). Evaluation of teacher attributes as predictors of success in urban schools. *Journal of Teacher Education, 55*(2), 177-187. https://doi.org/10.1177/0022487103261569

Sahin, S. (2004). Okul muduru ve ogretmenler ile okulun bazi ozellikleri acisindan okul kulturu uzerine bir degerlendirme [A study of school culture with some features of school as perceived by teachers and principals]. Kuram ve Uygulamada Egitim Yonetimi, 39, 458-474.

Sahin, S. (2010). An investigation of school culture with respect to some variables. Elementary Education Online, 9(2), 561-575.

Scheerens, J., & Creemers, B. P. (1989). Conceptualizing school effectiveness. *International Journal of Educational Research, 13*(7), 691-706.

Schermelleh-Engel, K., Moosbrugger, H., & Muller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of psychological research online*, *8*(2), 23-74.

Senel, T. (2015). İlkokullarda okul iklimi ile okul etkililigi arasindaki iliski [The relationship between organizational climate and school effectiveness in primary schools] (Master Thesis). Gazi University, Institute of Educational Sciences, Ankara.

Senel, T., & Buluc, B. (2016). The relationship between organizational climate and school effectiveness in primary schools. *TUBAV Journal of Science, 9*(4), 1-12. http://www.dergipark.org.tr/tr/pub/tubav/issue/24727/261489

Sezgin, F. (2010). School culture as a predictor of teachers' organizational commitment. *Education and Science, 35*(156), 142-159.

Shaw, J., & Reyes, P. (1992). School cultures: Organizational value orientation and commitment. *The Journal of Educational Research, 85*(5), 295-302.

Sigurðardóttir, A. K. (2010). Professional learning community in relation to school effectiveness. *Scandinavian Journal of Educational Research, 54*(5), 395-412. https://doi.org/10.1080/00313831.2010.508904

Stoll, L., Bolam, R., McMahon, A., Wallace, M., & Thomas, S. (2006). Professional learning communities: A review of the literature. *Journal of Educational Change, 7*(4), 221-258. https://doi.org/10.1007/s10833-006-0001-8

Tabachnick, B. G. & Fidell, L. S. (2013). *Using Multivariate Statistics*. Boston: Pearson.

Terzi, A. R. (2005). İlkogretim okullarinda orgut kulturu [Organizational culture in primary schools]. *Kuram ve Uygulamada Egitim Yonetimi, 43*, 423-442.

Van Houtte, M. (2005). Climate or culture? A plea for conceptual clarity in school effectiveness research. *School Effectiveness and School Improvement, 16*(1), 71-89. https://doi.org/10.1080/09243450500113977

Van Houtte, M., & Van Maele, D. (2011). The black box revelation: In search of conceptual clarity regarding climate and culture in school effectiveness research. *Oxford Review of Education, 37*(4), 505-524. https://doi.org/10.1080/03054985.2011.595552

Vanblaere, B., & Devos, G. (2016). Exploring the link between experienced teachers' learning outcomes and individual and professional learning community characteristics. *School Effectiveness and School Improvement, 27*(2), 205-227. https://doi.org/10.1080/09243453.2015.1064455

Watson, N. (2001). Promising practices: What does it really take to make a difference? *Education Canada, 40*(4), 4-6.

Yavuz Tabak, B., Sahin, F., & Tabak, H. (2018). The relationship between elementary school teachers' perceptions about their workaholism levels and organizational health. İnonu University Journal of the Faculty of Education, 19(3), 610-621. https://doi.org/10.17679/inuefd.469687

Zhu, C., Devos, G., & Li, Y. (2011). Teacher perceptions of school culture and their organizational commitment and well-being in a Chinese school. *Asia Pacific Education Review, 12*(2), 319-328. https://doi.org/10.1007/s12564-011-9146-0