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## Investigating professional learning communities in Turkish schools: the effects of contextual factors

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A great number of studies have focused on professional learning communities in schools, but only a limited number of studies have treated the construct of professional learning communities as a dependent variable. The purpose of this research is to investigate Turkish schools' capacity for supporting professional learning communities and to examine factors that account for variation in the current level of development. The data for this study were collected from 492 school staff members, including teachers, principals and assistant principals, working at 27 schools across nine provinces of Turkey. Results indicate that school staff had a culture of sharing and collaboration, but suffered from a lack of material and human resources required for supporting effective learning communities. The experience of the staff, as well as the size and socioeconomic status of the school, appeared to be the most important factors in predicting the variation in the available professional learning communities. The results are discussed considering current educational policy and practice in Turkey.

**Keywords:** professional development; professional learning communities; school improvement; socioeconomic status; Turkey

### Introduction

Contemporary educational literature has concluded that teachers are the most important school-related factor for student learning (Rivkin *et al.* 2005, Koedel 2009). They hold a substantial responsibility for improving the quality of school and educational systems by serving diverse communities of students (Darling-Hammond 1999, Wenglinsky 2002). While working to help students reach higher proficiency levels in standards-based tests, teachers are also required to provide students with practical conversation, deeper knowledge and connections with the real world which encourage higher quality thinking. However, which efforts actually contribute to sustained progress for all students and meet the demands of a diverse student body remains an unresolved question for researchers. Recent studies have suggested that carrying out this mission is impossible for schools whose teachers are deprived of necessary support and constructive interaction with their peers (Morrissey 2000, Jamentz 2002, Darling-Hammond 2010).

Creating a supportive culture and conditions for making important progress in teaching and learning has been presented as a critical feature that is necessary for

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schools, in order to prevent teachers from becoming isolated and to help them meet the needs of their students (Jamentz 2002). ‘For more than two decades, research has shown that teachers who experience frequent, rich learning opportunities have in turn been helped to teach in more ambitious and effective ways’ (Little 2006, p. 1). To provide such frequent and rich learning opportunities, many reform efforts have applied professional learning communities (PLCs) as a strategy, because effective PLCs are known to improve the quality of teaching and learning (Little 2006) and to ‘increase student achievement by creating a collaborative school culture focused on learning’ (Feger and Arruda 2008, p. 1).

Among other efforts to improve schools, Cranston (2009) argued that reforming a school into a PLC is the most promising approach. Considering the impact of globalization, rapid market changes and increased international competition in education, successful development of PLCs can help schools to effectively address some of the problems that educators in the twenty-first century face. Indeed, the existence of strong PLCs in schools has a positive impact on teacher effectiveness (Boyle *et al.* 2005, Goddard *et al.* 2007, Graham 2007, Vescio *et al.* 2008, Wahlstrom and Louis 2008, Cranston 2009) and student achievement (McLaughlin and Talbert 2006, Goddard *et al.* 2007, Vescio *et al.* 2008, Lomos *et al.* 2011). PLCs are a considerable driving force for building teacher and school capacity, which results in improved achievement for all students (Youngs and King 2002, DuFour 2004). Through PLCs, teachers are provided with access to the resources and professional learning opportunities necessary for restructuring learning environments to meet the educational needs of their increasingly diverse student populations (King *et al.* 2010).

There are a great number of studies on PLCs in the literature. A substantial body of research has attempted to provide in-depth conceptual understanding of the key components of PLCs (DuFour 2004, 2006, 2007, Giles and Hargreaves 2006, Stoll and Louis 2007, DuFour and DuFour 2010). Other studies were empirically grounded and yet treated the construct as an independent variable. For instance, researchers have examined the effects of PLCs on teachers’ instructional practice (Boyle *et al.* 2005, Goddard *et al.* 2007, Graham 2007), student learning outcomes (McLaughlin and Talbert 2006, Lomos *et al.* 2011), leadership capacity and collective efficacy (Olivier and Hipp 2006), and faculty trust and teacher commitment (Lee *et al.* 2011). However, there is very little research that examines the variation in PLCs using the construct of PLC as a dependent variable. For instance, there is a lack of research that looks at the extent to which contextual factors – such as teachers’, students’ and principals’ backgrounds – affect the development of PLCs in schools. The present study fills this gap in the literature by examining the variation in PLCs as explained by several key school and staff characteristics in the context of Turkish schools.

In Turkey, where the education system is tightly centralized, some regulatory mechanisms in the form of meetings are mandated for teachers by the Ministry of National Education (MoNE) in order to create learning communities and reduce isolation. For instance, the MoNE mandates that schools hold grade-level and subject-matter meetings so that teachers can share and discuss effective practices implemented in their classrooms. Furthermore, teachers from various schools are required to gather together for the purpose of identifying problems that students and teachers face, and for setting goals for the improvement of student learning. However, the extent to which these practices mandated by MoNE help schools create effective PLCs is unknown. Also, there is a lack of knowledge regarding the factors that can

explain the variation in the PLCs. Little research has been done regarding the capacity of schools for PLCs and factors associated with their development, particularly in Turkey (for example, Celep *et al.* 2011). The purpose of this study is to examine the extent to which PLCs are prevalent in Turkish schools, and to investigate factors that explain variation in the level of PLC development. The main research questions of this study are as follows:

1. According to administrators and teachers, to what extent have PLCs developed in Turkish schools?
2. How do participants' characteristics (gender, age, educational level and experience) explain the variation in administrators' and teachers' perceptions of PLCs in Turkish schools?
3. How do school characteristics (school level and socioeconomic status of students) explain variation in administrators' and teachers' perceptions of PLCs in Turkish schools?
4. Which school and participant characteristics are significant predictors of the variation in the participants' perceptions of PLCs in Turkish schools?

### **Theoretical perspective**

This section provides a detailed introduction to a conceptual framework developed by Olivier *et al.* (2003) that guides the rest of this study. In their model, Olivier *et al.* (2003) identified six essential components of PLCs, including shared and supportive leadership, shared values and vision, collective learning and application, shared personal practice, supportive conditions – relationships and supportive conditions – structures.

#### ***Shared and supportive leadership***

After examining schools with PLCs, Huffman and Hipp (2003) suggested that PLCs cannot be developed without constructing shared and supportive leadership within the school community. This is indicative that schools have become extremely complex and such complexity is beyond any single leader's capabilities to handle (Kocolowski 2010). Therefore, it has increasingly been recommended that leadership should be distributed among teachers (Gronn 2002). In addition, through their responsibility to prepare students to be ready for the twenty-first century, schools are being pushed into a global competition. Considering the increasing workload that school leaders have to deal with, they simply cannot accomplish all of this alone and develop successful PLCs, especially when PLCs create extra work for these school leaders. Huffman and Hipp (2003) found that schools which promote shared and supportive leadership with a shared vision are much more likely to be successful in establishing effective PLCs than schools which lack these characteristics. Researchers who examined conditions necessary for PLCs considered shared leadership highly critical for the creation of PLCs (Eaker *et al.* 2002). Similarly, Eaker *et al.* (2002) viewed school administrators as 'leaders of leaders.' Sharing leadership roles promotes the development of a collective sense of responsibility necessary for PLCs (Sergiovanni 2004).

### ***Shared values and vision***

PLCs, which are built on social and collaborative learning theories, require individual teachers to garner common goals and form teams to achieve these goals (Olivier *et al.* 2003). In fact, a PLC requires stakeholders to work collaboratively as teams in which members try hard to contribute to student learning (DuFour 2004, Hord 2004, Simon 2012). However, constructing such collaborative teams is impossible with values and vision that have been enforced with a top-down approach, but is very much possible with values and vision that have been created and embraced in a democratic and collaborative environment (Senge 1990). Hence, drawing people into an environment of shared values and a common vision is another characteristic necessary for creating learning organizations (Hord 2004, Andrews and Lewis 2007, Simon 2012). To examine the roles that shared values and vision play in the creation of PLCs, Huffman (2001, p. 1) compared schools with ‘matured’ PLCs with schools with ‘less matured’ PLCs, and found that shared values and vision provide schools with ‘the foundation for informed leadership, staff commitment, student success, and sustained school growth.’ Huffman also found that schools develop a common vision so that they can support students and improve their learning. Yet this requires every stakeholder’s involvement in a culture of ‘trust, respect, and self-esteem’ (Huffman 2001).

### ***Collective learning and application***

Collective learning and its application represent another key element of effective PLCs (Hord 2004, Stoll *et al.* 2006, Olivier *et al.* 2003). This refers to PLCs’ ability to collectively work together to produce solutions to various instructional problems teachers face, and to apply their collective knowledge to these problems (Hord 2004). Huffman and Hipp (2003, p. 9) characterized this dimension with ‘five critical attributes: shared information and dialogue; collaboration and problem solving; and application of knowledge, skills, and strategies.’ Based on their shared values and vision that focus on student learning, teachers in effective PLCs strive to improve their teaching skills and practices to realize this ideal (Hord 2004). In schools developing effective PLCs, prevailing culture and structures enable and encourage teachers to come together and work collaboratively to find solutions to various learning problems faced by their students (DuFour 2004, Hord 2004). As a result of their collective efforts to develop instructional knowledge, skills and strategies, these schools are able to build communities with a constant flow of information. Research suggests that schools which support teachers in developing collective instructional strategies for student learning problems are able to improve the quality of their teaching, as well as to improve learning results for their students (Newmann and Wehlage 1995, Louis and Marks 1998). However, to create schools where collective learning and its application are the norm, supportive and shared leadership as well as shared values and vision also need to be present (Olivier *et al.* 2003).

### ***Shared personal practice***

Olivier *et al.* (2003) stated that teachers working in collaborative teams establish trust-based relationships that enable them to conduct classroom visits, share their ideas with one another and mentor and monitor each other’s instruction. Olivier

*et al.* also argued that shared practice involves observing colleagues' instruction, providing them with feedback and sharing outcomes of personal instruction. In PLCs, peer mentoring and coaching become the norm. Teachers meet regularly, analyze each other's instructional practices and seek advice from one another (Hord 2004). In addition to preventing isolation (Little as cited in Higgins 2010), this understanding of shared practice also enables teachers to benefit from others' experiences and expertise.

### ***Supportive conditions – relationship***

Olivier *et al.* (2003) classify supportive conditions under two categories: collegial relationships and structures. To break isolation and form effective PLCs, schools must first establish trust and respect-based supportive relationships among all of the school's stakeholders (Huffmann and Hipp 2003). Teachers in PLCs need to be able to communicate openly with each other and with other stakeholders. Questioning existing practices should become the norm, because collective inquiry about existing instructional methods and structures are necessary for improving them (Huffmann and Hipp 2003). In this sense, especially, school leaders need to be open to new ideas and become agents for change.

### ***Supportive conditions – structure***

The last critical component articulated in Olivier *et al.*'s (2003) model is establishing organizational structures in ways that enable teachers to engage in rewarding professional conversations. School structures should promote a culture of professional dialog among the teachers (DuFour and Eaker 1998) and provide them with the necessary time, resources and mechanisms to support this dialog (Olivier *et al.* 2003).

### **Conceptual framework**

From an organizational perspective, any effective system – including schools – is composed of three key components: input, process and outcome. The quality of inputs substantially affects the effectiveness of the processes, which are in turn fundamental for producing desired outcomes (Porter 1991). In an educational context, the antecedent variables – such as the backgrounds of students, teachers and principals – influence the effective operations of school processes, as well as student learning outcomes. Also, the components of school process – such as school climate, collaboration among teachers and leadership practices – are key predictors of such outcomes (Hallinger *et al.* 1996). Supporting this theory, research has found that developing effective PLCs in the schooling process enables the staff to have a collective focus on teaching and learning, which ultimately promotes student learning outcomes (DuFour 2004). In addition, the effectiveness of a PLC is not independent from the characteristics of the context in which the school exists (Timperley *et al.* 2008). Hence, it makes sense to argue that the characteristics of the school itself, its personnel and its people are primary school inputs that determine the quality of PLCs. Drawing upon this framework, the research examines the quality of PLCs developed in Turkish schools, as well as key factors determining their quality. A quantitative research approach is employed. The analyses start with validating

a tool that assesses schools' capacity for developing effective PLCs. Then, descriptive statistics, including the mean and standard deviation, are used to elucidate the strengths and weaknesses of PLCs in Turkish schools. Finally, several inferential statistics are employed, in order to provide an understanding of how context characteristics may explain the variation in the perceived levels of PLCs' development.

## Method

### Sample

The participants of this study included 492 school staff including teachers, principals and assistant principals, working at 27 schools across nine provinces of Turkey. In order to obtain a representative sample of the target population, the participating teachers were recruited from various geographical regions of Turkey. To determine the sample, our research team determined a total of nine provinces from three geographical areas of Turkey, including eastern, central and western regions. Two elementary schools and one secondary school were then selected randomly from each city. The reason for selecting two elementary schools from each city was because elementary schools are relatively small in their number of personnel compared with secondary schools. All schools selected were located in the city center, due to the difficulty of transportation to rural areas for the research team. Finally, teachers were randomly selected from each of the selected schools. The sample also included the principal and assistant principals of the selected schools. Table 1 presents the characteristics of the study sample.

The majority of participants in this study were male (58.9%). Over 90% of the participants actively worked as teachers, while the remaining participants had administrative roles, such as principal and assistant principal, at their schools. Also, most of the teachers (77.2%) had a secondary education major with specialized content

Table 1. Descriptive summary of the participants.

Category	Frequency	%
Gender		
Female	202	41.1
Male	290	58.9
Major		
Elementary education	101	21.0
Secondary education	380	79.0
Professional role		
Principal	7	1.4
Assistant principal	32	6.6
Teacher	447	92.0
Formal education		
Pre-college	16	3.3
College	414	85.4
Master's	54	11.1
Doctorate	1	0.2
School level		
Primary school	115	23.4
Middle school	185	37.7
High school	191	38.9

expertise (e.g. science, mathematics, etc.). Among all participants, seven (1.4%) were principals, 32 (6.6%) were assistant principals and 447 (92%) were teachers. The average age of participants was 36 years, with ages across the sample ranging between 20 and 60 years. The average of participants' total work experience in education was 11 years, ranging from one to 40 years across the sample. In terms of the educators' experience in their current schools, the average was four years but this ranged from one to 20 years across the sample.

### ***Instrument***

The instrument utilized in this study was the Professional Learning Communities Assessment – Revised (PLCA-R; Olivier *et al.* 2003), which was used to evaluate the effectiveness of PLCs in Turkish schools. Initially, the instrument was titled 'Professional Learning Communities Assessment' and aimed to assess teachers' and administrators' perceptions regarding the effectiveness of PLCs in their schools. Later, those who developed the instrument figured out that one important aspect was missing from the instrument: the collection, interpretation and use of data in order to focus improvement efforts (Olivier and Hipp 2010, p. 30). To address this issue, the instrument was revised by adding seven new items to different dimensions. The seven items added to the revised instrument are as follows: one item in the dimension of shared and supportive leadership, one item in the dimension of shared values and vision, two items in the dimension of collective learning and application, one item in the dimension of shared personal practice, one item in the dimension of supportive conditions – relationships and one item in the dimension of supportive conditions – structures (Olivier and Hipp 2010). After adding these items to the instrument, the new instrument was titled 'Professional Learning Communities Assessment – Revised (PLCA-R)':

The PLCA-R provides perceptions of the staff relating to specific practices observed at the school level with regard to shared and supportive leadership, shared values and vision, collective learning and application, shared personal practice, and supportive conditions, including both relationships and structures. (Olivier *et al.* 2009, p. 5)

Consistently, the PLCA-R instrument consists of six subscales: shared and supportive leadership, shared values and vision, collective learning and application, shared personal practice, supportive conditions – relationships and supportive conditions – structures. Each subscale includes nine to 11 Likert-type questions where participants evaluate each statement on a four-point scale (1 = strongly disagree, 2 = disagree, 3 = agree and 4 = strongly agree). The PLCA-R consists of 52 items in total.

The reason for using the PLCA-R in this study was that it views the concept of PLCs as a collective process, rather than the often-referred-to collaborative practices simply among teachers. It views the PLC concept as more holistically embedded within the school culture. The dimensions of the PLCA-R are detailed through its critical attributes and connected to the change process, while embedding this overall process within the school culture (Olivier *et al.* 2003). Such description is consistent with our research team's conceptual framework in which we considered PLCs as a process variable. In addition, the PLCA-R is a comprehensive tool that has been widely used both by researchers and practitioners, and that has continued 'to serve as an effective formal diagnostic tool for identifying school level practices that enhance intentional professional learning' for many years (Olivier *et al.* 2009, p. 5).<sup>1</sup>



### ***Translation procedures***

Because the original version of the PLCA-R was written in English, the researchers in this study translated the PLCA-R items into Turkish and revised the instrument within the context of Turkish schools. The language of the PLCA-R was first translated into Turkish by the researchers and two content experts. An English language specialist then translated the Turkish form of the instrument back to English to validate the translation procedure of the instrument. During this process, several words appeared particularly challenging to translate. Appropriate translations of those words were discussed with an English language specialist. Lastly, the researchers deployed a think-aloud protocol by asking several teachers to evaluate the clarity of the content in the translated instrument. The instrument was finalized based on the feedback given by these participants, and then the researchers launched the final version of the PLCA-R. As with its original form, the adapted version of the PLCA-R consists of 52 items that evaluate PLCs in schools based on a four-point scale.

### ***Data collection***

The first author of this study completed data collection by visiting each participating school in the study sample. A paper form of the adapted PLCA-R was administered to the recruited teachers, assistant principals and principals. The forms were distributed to the participating teachers in person by the primary researcher of this study. This gave a chance to articulate the purpose of the study to the participants and respond to their questions and concerns. A total of 700 forms were distributed. Although this number may seem small given the total population of teachers in the country, the lack of an online survey opportunity diminished the potential to reach out to more participants. The majority of participants filled out the form and returned it on the same day of its distribution, while some participants wanted to take it to home and return it the day after. At the end of the next day, a total number of 492 PLCA-R forms were completed and returned (70.3% response rate). The data collection process took place during the 2014/15 academic year and lasted about five months.

### ***Statistical analysis***

Previous studies on the PLCA-R provided evidence for the construct validity of the PLCA-R and yielded satisfactory internal consistency for its subscales (Olivier *et al.* 2003). In this study, we first examined the PLCA-R at both item and scale levels. Item-total correlations of the items in the PLCA-R were examined to identify the items that may not be aligned with the rest of the items in the instrument. A low item-total correlation would suggest that the item fails to discriminate between the participants with low and high perception of PLCs. Furthermore, at the scale level, internal consistency of the six subscales of the PLCA-R and of the whole instrument was evaluated using the coefficient alpha (Cronbach 1951). Internal consistency of the subscales and of the whole instrument would indicate the extent to which all of the PLCA-R items measure the same construct. The closer a scale's coefficient alpha is to 1.0, the greater the internal consistency of the items in the scale. According to George and Mallery (2003, p. 231), a coefficient alpha larger than 0.7 indicates an acceptable level of internal consistency, a coefficient alpha larger than 0.8 indicates

good internal consistency and a coefficient alpha larger than 0.9 indicates excellent internal consistency.

Second, the underlying factor structure of the PLCA-R was examined. According to Olivier *et al.* (2003), a single factor that represents all subfactors can account for the majority of the variance in the PLCA-R items. In this study, we used exploratory factor analysis and confirmatory factor analysis (CFA) approaches to examine the underlying factor structure of the PLCA-R. First, an exploratory factor analysis model with a varimax rotation was fit to the data to investigate whether there was a dominant single factor that could account for the majority of the variance. Second, we considered each of the six subscales in the PLCA-R as unique factors and compared the fit of the resulting six-factor model against the one-factor model using a CFA approach in Mplus (Muthén and Muthén 1998–2012). The fit of the CFA models was evaluated based on the factor loadings of the items and model-fit indices, such as the comparative fit index, Tucker-Lewis index and root mean square error of approximation. There are different recommendations in the literature regarding the type, number and cut-off values for goodness-of-fit indices. Tucker-Lewis index and comparative fit index values greater than 0.90 are considered acceptable, and values greater than 0.95 are considered a good fit (Hu and Bentler 1999). Root mean square error of approximation values smaller than 0.05 are usually considered a close fit, while values equal to or greater than 0.10 are considered a poor fit (Browne and Cudeck 1993).

Third, the results of the PLCA-R were investigated to understand the relationship between each subscale of the PLCA-R, participant characteristics (e.g. gender, age, work experience and educational background) and school characteristics (e.g. school level and socioeconomic background of students). To identify important participant and school characteristics related to the PLCA-R, correlations among continuous variables (e.g. age, participants' work experience and the schools' total enrollment) and the PLCA-R subscale scores (i.e. average item scores from each subscale) were investigated. Analysis of variance (ANOVA) was conducted to examine the associations between the categorical variables (e.g. gender, professional role at school, participants' education level and the average socio-economic status (SES) level of the school) and the PLCA-R subscale scores. The continuous and categorical variables that indicated a strong association with the PLCA-R were used in multiple regression analyses to predict the PLCA-R subscale scores.

## Results

### *Reliability and validity of PLCA-R*

The item-level analysis indicated that the items in the PLCA-R functioned well across the instrument. Figure 1 shows the distribution of item-total correlations from the PLCA-R items.

Most of the items had item-total correlations between 0.65 and 0.70, suggesting that the items were able to distinguish participants who differ in their perception of PLCs. At the scale-level analysis, internal consistency of the PLCA-R was examined using coefficient alpha (Cronbach 1951). Table 2 indicates that all of the PLCA-R subscales had high internal consistency ( $\alpha > 0.87$  or larger). Internal consistency for the overall instrument was the highest ( $\alpha=0.95$ ) as a result of including all of the items in the instrument.

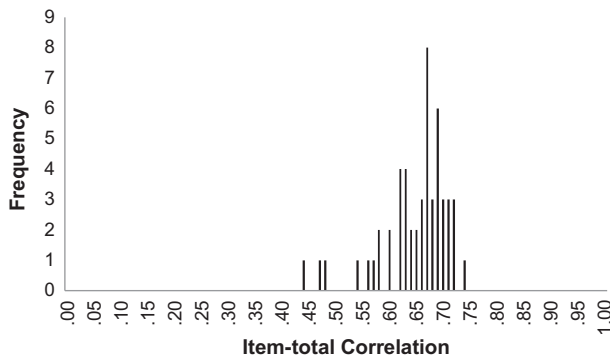


Figure 1. Item-total correlations of items in the PLCA-R.

Table 2. Reliability of the PLCA-R subscales.

Scale	Number of items	Reliability
Shared and supportive leadership	11	0.92
Shared values and vision	9	0.90
Collective learning and application	10	0.92
Shared personal practice	7	0.90
Supportive conditions – relationships	5	0.87
Supportive conditions – structures	10	0.92
Overall	52	0.97

The underlying factor structure of the PLCA-R was first examined using an exploratory factor analysis approach. The scree plot of the PLCA-R in Figure 2 shows that although there was one particular factor which explained a great amount of variance in the PLCA-R items, there were other factors which accounted for additional variance.

As opposed to the one-factor model suggested by Olivier *et al.* (2003), it was hypothesized that each subscale of the PLCA-R could be considered as a separate factor. To compare the one-factor model against the hypothesized six-factor model, a CFA approach was used. Table 3 presents a summary of the model-fit indices from the two models.

The fit of the one-factor model was not satisfactory based on the model-fit criteria mentioned earlier. Unlike the one-factor model, the six-factor model indicated better model fit in which all fit indices were close to the desired criteria. Table 4 presents the correlations among the six factors in the six-factor model.

Although the factors seemed to have high correlations, they were not high enough to combine all factors into one single factor. Therefore, in the subsequent analyses each subscale of the PLCA-R was considered as a unique factor.

### *Descriptive statistics*

Table 5 presents a summary of the descriptive statistics for the subscale scores. These scores were computed by finding the average item scores for each subscale. This provided a PLC profile of the participating Turkish schools.

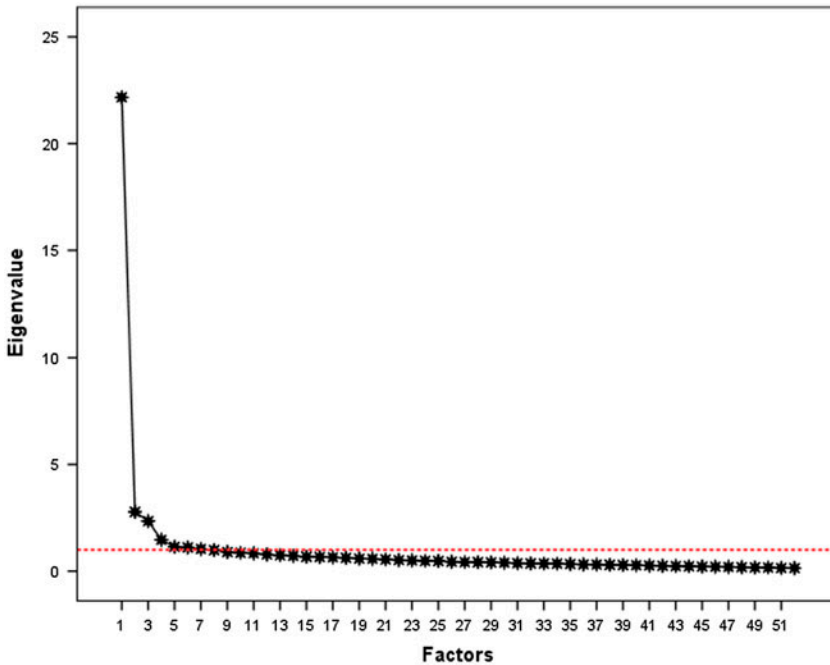


Figure 2. Scree plot from the exploratory factor analysis of the PLCA-R.

Table 3. Results of the one-factor and six-factor CFA models for the PLCA-R.

Model	$\chi^2$	<i>df</i>	CFI	TLI	RMSEA
One-factor	6528.204	1274	0.847	0.841	0.092
Six-factor	3233.697	1259	0.943	0.939	0.056

Note: *df*, degrees of freedom; CFI, comparative fit index; TLI, Tucker-Lewis index; RMSEA, root mean square error of approximation.

Table 4. Correlations among the factors from the six-factor CFA model for the PLCA-R.

	F1	F2	F3	F4	F5	F6
F1: Shared and supportive leadership	1.00					
F2: Shared values and vision	0.88	1.00				
F3: Collective learning and application	0.75	0.92	1.00			
F4: Shared personal practice	0.71	0.88	0.92	1.00		
F5: Supportive conditions – relationships	0.82	0.89	0.88	0.87	1.00	
F6: Supportive conditions – structures	0.74	0.79	0.82	0.82	0.87	1.00

According to Table 5, the average subscale scores ranged from 2.45 to 2.81, showing a tendency toward 3 (agree). The lowest mean is 2.45 and belongs to the supportive conditions – structures category, which is closer to 2 (disagree) than the other subscale scores. The highest mean is 2.81 and belongs to shared leadership, implying that most participants would agree there is a culture of shared leadership in their schools.

Table 5. Descriptive statistics for average scores from the PLCA-R subscales.

Subscale	N	Mean	Standard deviation	Minimum	Maximum
Shared leadership	490	2.81	0.59	1.00	4.00
Shared vision	491	2.74	0.56	1.00	4.00
Collective learning	492	2.67	0.58	1.00	4.00
Shared practice	490	2.70	0.60	1.00	4.00
Supportive conditions – relations	492	2.72	0.65	1.00	4.00
Supportive conditions – structures	491	2.45	0.64	1.00	4.00

The summary of descriptive statistics for the subscale scores showed that the supportive conditions – structures subscale of the PLCA-R has the lowest mean value. To further understand what specific structures lack, the item-based summary of descriptive statistics for the supportive conditions – structures subscale is presented in Table 6.

According to Table 6, the six items under the supportive conditions – structures subscale have the lowest mean. These items are the availability of time, appropriate school schedule, fiscal resources, technology and instructional materials, and resource people – all of which are fundamental for establishing effective PLCs. Although Table 6 provides some information regarding the strengths and weaknesses of the PLC profile of Turkish schools, it lacks the information to reveal the variation in this profile. To address this problem, several preliminary analyses were conducted.

### *Preliminary analysis*

Preliminary analysis of the participant-related and school-related predictors was conducted using the subscales scores. The primary analyses used in the study included

Table 6. Descriptive statistics for items from the supportive conditions – structures subscale.

Item	N	Mean	Standard deviation	Minimum	Maximum
Time is provided for collaborative work	492	2.36	0.81	1.00	4.00
Appropriate school schedule for collective learning	492	2.41	0.84	1.00	4.00
Fiscal resources are available	492	2.15	0.84	1.00	4.00
Technology and instructional materials are available	492	2.37	0.91	1.00	4.00
Resource people provide expertise for learning	492	2.36	0.84	1.00	4.00
The school facility is clean, attractive and inviting	492	2.54	0.95	1.00	4.00
The proximity of grade level and department personnel allows for ease in collaborating with colleagues	492	2.61	0.79	1.00	4.00
Communication systems promote a flow of information among staff members	492	2.63	0.80	1.00	4.00
Communication systems promote a flow of information across the entire school community	492	2.58	0.78	1.00	4.00
Data are organized and made available	492	2.53	0.84	1.00	4.00

ANOVA and Pearson correlation. Specifically, ANOVA was used to examine the relationship between each dummy variable (gender, SES, educational level, major, professional role and school level) and each PLCA-R subscale. Pearson correlation was used to investigate the relationship between continuous variables (school size and experience) and the PLCA-R subscales.

The results indicated that there was no significant difference between female and male participants in any of the PLCA-R subscale scores. Similarly, the PLCA-R subscale scores did not seem to differ across education levels or the participants' majors (i.e. elementary or secondary). The significant predictors were the participants' professional role (i.e. principal, assistant principal or teacher), total professional experience, SES and the total student enrollment at schools. These significant predictors were used in the multiple regression analysis. However, age was not included in the multiple regression analysis, due to a very high correlation between age and experience ( $r > 0.90$ ).

### *Inferential statistics*

Participant and school characteristics that were significantly related to the PLCA-R subscales were included in several regression analyses in which each subscale was the dependent variable, in order to isolate the factors that significantly predict the PLCA-R subscales. Table 7 presents the results of several multiple regression analyses.

Regression analysis showed that there was a substantial difference between assistant principals and teachers in their perceptions of both shared leadership ( $\beta = 0.39$ ,  $p < 0.05$ ) and shared vision ( $\beta = 0.242$ ,  $p < 0.001$ ), such that assistant principals possess more positive views about these two subscales of PLCA-R. However, no significant difference was found between teachers' and principals' perceptions of these attributes.

Table 7 also shows a significant and positive relationship between experience and four subscales of the PLCA-R, including shared leadership ( $\beta = 0.01$ ,  $p < 0.05$ ), collective learning ( $\beta = 0.01$ ,  $p < 0.05$ ) and supportive conditions both in terms of relationships ( $\beta = 0.01$ ,  $p < 0.05$ ) and structures ( $\beta = 0.02$ ,  $p < 0.05$ ), implying that school personnel's perception of PLCs becomes more positive with the additional experience they gain. SES also appeared an important predictor of the current stance of PLCs in Turkish schools. According to Table 7, there is a statistically significant and positive association between the average SES level of students and all subscales of the PLCA-R. Specifically, a one-point increase in the SES level of students boosted perceptions of shared leadership and vision by 0.16, collective learning and shared practice by 0.18, supportive conditions – relationships by 0.22 and supportive conditions – structures by 0.19. Overall, these results suggest that school personnel working at high-SES schools have more positive views regarding the stance of their schools' development of PLCs. Finally, school size (the number of students) was found to be a significant predictor of perceived PLC success. Although coefficients for each subscale were 0.00, implying that it is a very small number, negative 'beta' values suggest significant yet negative association between school size and each subscale of the PLCA-R. This means that as the school size increases, participants' perceptions of PLCs become less positive.

Table 7. Results of multiple regression analysis for subscores from the PLCA-R.

Predictor	Factor 1		Factor 2		Factor 3		Factor 4		Factor 5		Factor 6	
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE
Principal	0.24	0.22	0.06	0.21	-0.02	0.21	0.23	0.22	-0.09	0.24	-0.01	0.23
Assistant principal	0.39*	0.11	0.23*	0.10	0.07	0.11	0.19	0.11	0.21	0.12	0.17	0.12
Experience	0.01*	0.00	0.01	0.00	0.01*	0.00	0.01	0.00	0.01*	0.00	0.02*	0.00
SES	0.16*	0.04	0.16*	0.04	0.18*	0.04	0.18*	0.04	0.22*	0.05	0.19*	0.05
Enrollment	0.00*	0.00	0.00*	0.00	0.00*	0.00	0.00*	0.00	0.00*	0.00	0.00*	0.00
$R^2$	0.09		0.08		0.08		0.07		0.10		0.10	

Note: Factor 1, shared leadership; Factor 2, shared vision; Factor 3, collective learning; Factor 4, shared practice; Factor 5, supportive conditions – relations; Factor 6, supportive conditions – structures; SE, standard error.  $R^2$  is the proportion of variance explained by the predictors.

\* $p < 0.05$ .

## Discussion

This study had two main purposes: investigating Turkish schools' capacity for developing PLCs; and examining several personnel-related and school-related factors that account for the variation in the current level of its implementations of PLCs.

Since there was no available instrument that could be used for examining PLCs in Turkish schools, this study validated the PLCA-R instrument developed by Olivier *et al.* (2003) for use within the Turkish school and educational context. According to the results of validity and reliability analyses, the PLCA-R subscales had high internal consistency. In opposition to Olivier *et al.* (2003), who suggested that all subscales of the PLCA-R should be considered as one factor, this study showed that each subscale of the survey could be considered as a separate factor since the six-factor model resulted in a better model fit. Although evidence existed for high correlation among factors in this study, correlations were not high enough for subscales to be considered as one factor. As a result, the subscales of the PLCA-R are unique and therefore should be examined separately in the Turkish school and educational contexts. Policy-makers, researchers and practitioners in Turkey can now employ the tool to assess and improve the effectiveness of PLCs in schools.

One purpose of this study was to examine the current stance of schools in terms of developing PLCs. The descriptive analysis indicated that most participants agreed that PLCs are well developed in their schools. Specifically, the most agreed-upon practice of PLCs was shared leadership. School personnel believed that there is a culture of sharing leadership in their schools. Similarly, results indicated evidence for the strength of shared vision, shared personal practice among teachers and collective learning and applications. This finding is promising, because it suggests the existence of collaboration and shared practices among personnel aiming to promote professional development and collaborative learning in schools. The positive view among teachers and administrators regarding the existence of a culture promoting sharing could be a result of the opportunities provided in these schools for teachers to come together by holding grade-level and subject-matter meetings on a regular basis. In those meetings, teachers and administrators engage in discussions in order to make educational programs and courses consistent; effectively use educational materials and laboratories; prepare effective instructional techniques and materials; seek solutions to educational, instructional and disciplinary problems; learn about up-to date issues in education; and produce common measurement and assessment materials (MoNE 2013). It is possible to argue that such meetings were effective enough for teachers and administrators to be satisfied with the current level of collaboration and sharing, given the data gathered from this study.

The results showed that school structures for supporting the development of learning communities had the lowest mean score, which was close to the 'disagree' level. Dissatisfaction among school personnel in this area was related to several issues, including the availability of time, appropriate school schedules, fiscal resources, instructional materials and technology that are all fundamental for teachers to engage in collaborative work and professional development activities. In terms of time, the key problem is the school schedules. The way that school schedules are organized in Turkey does not give much chance for teachers to collaborate. Most schools serve a double-shift<sup>2</sup> and operate from early morning to night. In addition, a large amount of space in these school buildings is devoted to classroom use, and they therefore lack adequate facilities for other activities such as meetings (Gok and Gurol 2002).



In terms of fiscal resources, instructional materials and technology, the findings in this study concur with previous research examining the financial problems that Turkish schools face (Kavak *et al.* 1997, Zoraloglu *et al.* 2004, Hosgorur and Arslan 2014). Resources provided to schools in Turkey are limited and many schools suffer from a lack of adequate materials (Zoraloglu *et al.* 2004). However, the problem here is more about schools not having their own budget, which is necessary for satisfying fundamental needs. In such cases, school principals have to create their own resources. Many principals spend a substantial amount of their time finding additional resources for their schools. For instance, they may lease out the school canteen and the school garden for special events held by the surrounding community, organize fundraising fairs and seek donations from families and private businesses (Hosgorur and Arslan 2014). Furthermore, based on the perceptions of personnel gathered in this study, it is possible to state that schools also lack staff who can provide expertise and support for continuous learning, which also contributes to these negative perceptions. For instance, in Turkish schools there is no specialist or expert who can help teachers improve instructional practices by observing teaching, giving feedback, mentoring and providing assistance when needed (Bellibas 2015). For schools to develop better PLCs, they should have an appropriate schedule based on teachers' needs and be provided with necessary financial support and human expertise (Olivier *et al.* 2003).

The third purpose of the current study was to reveal a number of personnel-related and school-related factors that account for the variation in the current stance of PLCs in Turkish schools. The results indicated a significant difference between teachers and assistant principals in shared leadership and shared vision subscales. This result is consistent with Hallinger's (2013) argument that administrative personnel are more likely to have positive perceptions of leadership in their schools, because this perception represents their own performance. However, this argument contradicts one finding from this study, which reported that there was no significant difference between teachers and principals in their perceptions of PLCs in the school. The contradiction here is most likely due to one limitation inherent in the sample size of the study. In this study the number of principals was very low ( $n=7$ ), which ultimately led to a less reliable result. Future studies should work with a larger number of principal participants for more reliable results revealing principals' perception of PLCs.

A second personnel-related factor that significantly explained the variation in the PLCs was experience. Those with more years of experience were found to have more positive views with regards to the existence of PLCs in their schools. This could possibly be explained through the high expectations and hopes that less experienced teachers usually have. Ghaith and Shaaban (1999) found that teachers early in their careers were more concerned than experienced teachers about their teaching and the impact that they make. If less experienced teachers are more enthusiastic about student learning, then it makes sense that they are not simply accepting the resources they have in their schools. Consequently, it is likely that less experienced teachers complain about the current stance of PLCs in their schools and envision better practices in terms of both sharing and available structures.

Two school-related factors, including the average level of SES of students and school size, were also found to be significantly related to the success of PLCs. This finding is consistent with the argument of Timperley *et al.* (2008), who indicated that the effectiveness of a PLC strongly depends on the context in which the

school exists. The idea of ‘context’ here also refers to the school community, both inside and outside the school. The results indicated that schools with low-SES students are less likely to develop PLCs. These schools seemed to suffer from less shared leadership, vision and personal practice, collective learning and application, and supportive conditions in terms of both structures and relations. One reason behind this finding might be the profile of teachers in low-SES schools. Like in many other countries, low-SES schools in Turkey have high teacher turnover rates. Teachers who are assigned to these schools tend to change schools as soon as they find a better option. In such cases, these schools are filled with less experienced teachers. This ultimately reduces the probability of forming the necessary conditions for effective PLCs – getting acquainted with other teachers, creating a sense of ownership and collegiality, focusing on learning and holding each other accountable for student results – which are indispensable for building strong learning communities that produce effective student outcomes (DuFour 2007). In addition, research has indicated that schools with high SES have the potential to bring in material and human resources using parental resources and expertise. However, parents of students in low-SES schools usually suffer from economic and social problems, which limit the quality and quantity of the support they can provide to the school (Bellibas and Gumus 2013).

The second key school-related factor is school size. This study showed that the larger the school was, the fewer the number of teachers who agreed with the availability and effectiveness of PLCs. This is consistent with previous research emphasizing the problems associated with larger schools. Brookmeyer *et al.* (2006) found that larger schools are more likely to suffer from negative climate and higher levels of violence. It is well accepted that a negative school climate is contrary to teacher collaboration. Supporting this statement, McNeely *et al.* (2002) found that the links necessary for teacher collaboration tend to be looser in schools with high student enrollment, since it is less likely that teachers in these environments can get acquainted with each other and build trust. This would affect the effectiveness of learning communities in these schools, since teacher collaboration and trust are two fundamental aspects of successful PLCs (Norwood 2007).

## Conclusion

Although some mechanisms are available in Turkish schools for teachers to collaborate and discuss the success of each student, none of the official documents of MoNE mention developing PLCs in Turkish schools. It is therefore important to assess the readiness of schools for developing PLCs by collecting data (Huffman *et al.* 2001). In this study, the perceptions of school personnel – including teachers, principals and assistant principals – regarding the current level of PLCs in Turkish schools were examined, in order to reveal the extent to which schools are ready for creating effective PLCs and the factors associated with variation of this readiness. The results were promising in terms of positive perceptions concerning some key components of PLCs.

This study showed that shared vision, leadership and personal practice, collective learning and application, and positive relations existed among staff. Sharing and collaborating are important because these concepts show signs of trust and collegiality among teachers. However, the extent to which such collaboration and sharing actually focuses on classroom practice, transforms traditional teaching into an effective

practice and ultimately influences student learning needs further investigation because a PLC is only meaningful when it contributes to student learning outcomes (DuFour 2004) and teachers' work lives (Stoll *et al.* 2006). From this study, it has become obvious that these schools generally lack an adequate amount of resources, such as time, technology, instructional materials and staff with expertise, to develop and effectively operate PLCs. Also, developing PLCs in crowded and low-SES schools appeared to be more challenging, since crowded and low-SES schools are less likely to foster a culture of sharing, collegiality and collaboration among staff; and they are more likely to suffer from insufficient resources as a consequence of the profile of teachers and the surrounding community.

Taking into account these findings, this study has important implications for both policy and practice. Since there is evidence of a school culture that is based on sharing and collaboration, it should not be too difficult for schools to establish their own PLCs. The key problem here appears to be the lack of material and human resources for supporting these learning communities. In terms of human resources, the school principal is the critical person who is familiar with the strengths and weaknesses of teachers in the school. She/he can benefit from the strengths of human resources by holding expert teachers responsible for the development and learning of others. The principal can work on motivating teachers and creating more effective school schedules and conditions that enable teachers to collaborate more frequently. Teachers, particularly those who teach the same grade level or subject matter, also play a substantial role in such context. They can support each other by observing classrooms, reflecting on teaching practices, providing constructive feedback and showing direction for growth.

To support such a mechanism, MoNE should create 'specialist' positions in schools and assign expert teachers to them (Bellibas 2015). Furthermore, it is imperative for MoNE to focus on providing and improving fiscal resources, instructional materials and technology in order to promote to the capacity of the school personnel who focus on the betterment of learning. A specific focus in this case should be on schools that suffer from large student populations with low SES. It is even more crucial for those schools to have effective teachers (Koedel 2009). An effective policy would be to assign effective and experienced teachers to those schools, in order to deal with the current unequal distribution of teaching staff (Ozoglu 2015a). This can be done by changing the seniority-based teacher assignment policy currently in place, or by putting into practice an effective promotion policy that encourages effective and experienced teachers to work at disadvantaged and crowded schools (Ozoglu 2015b).

Finally, alongside its important findings and conclusions, this study should be considered with a number of limitations inherent in it. First of all, the numbers of participants are low considering the total population of teachers and administrators working at schools in the country. In addition, the schools were selected only among those which were located in the city centers. However, given the limited resources that the researchers had and the challenges of the pencil-and-paper type of data collection, the sample size and location should be reasonable to produce useful data. Second, this study depends on the perceptions of teachers and administrators about the status of PLCs in their schools. A better picture of PLCs in schools could be captured through a qualitative study that is based on systematic and long-running observations.

### Disclosure statement

No potential conflict of interest was reported by the authors.

### Notes

1. The widespread application of the PLCA-R tool strengthened its validity and reliability, and rendered it even more appealing for this research. For a more detailed discussion, please see Olivier *et al.* (2009).
2. Double-shift schools serve two different bodies of students. Because of an overwhelming number of students, schools work in two shifts: serving one group of students from morning to noon and another group from noon to evening.

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