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Validating Professional Learning Communities Practice Model in a Malaysian Context

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Abstract: Despite the ubiquity of professional learning communities (PLCs) among researchers, studies on PLCs have widely differed in terms of dimensions used to conceptualise them. Thus, the study aimed to validate the conceptual model consisting of PLCs practices. The study employed a quantitative method using a survey. Firstly, a pilot test was conducted in which 103 school-teachers were involved in completing a questionnaire. The Exploratory Factor Analysis (EFA) had determined six dimensions and 20 elements of PLCs practices. Then, the field study was conducted using the new questionnaire. The survey involved 386 school-teachers from 25 High Performing Schools (HPS). The result revealed that: I) Based on the Confirmatory Factor Analysis (CFA), multidimensional PLCs practice model is evidence in the Malaysian context. They are operationalised in six dimensions including visions, missions and values, professional leadership, collective and collaborative culture, sharing of best practices, conducive school climate, and strategic alliances among stakeholders and, ii) The level of PLCs implementation in HPS is high for all the dimensions. The practical implications from the study and future research recommendations were also discussed.

Keywords: *Confirmatory factor analysis, exploratory factor analysis, Malaysia, professional learning communities.*

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Introduction

Professional learning communities (PLCs) have been proven to be an effective strategy for enhancing the development of professionalism among teachers in most countries, such as Canada, Australia, and the United Kingdom (Chen, 2020). Studies show that PLCs can enhance collaborative learning among teachers and reflective practices to improve their knowledge and teaching skills. These have indirectly resulted in the improvement of students' achievement (Othman et al., 2020). Thus, the benefits of PLCs in enhancing professional development and school improvement have gained the attention of researchers around the world (Harris et al., 2017).

Literature on PLCs is widely found in the West, whereas in the Asian context it is generally poorly studied, particularly in Malaysia (Hassan et al., 2018). Most Malaysian PLCs studies are based on western literature by adapting models and instruments from the west (Ishak et al., 2020). Exploration of studies based on institutional context and cultural factors has its distinctiveness compared to in the Western context (Zhang & Pang, 2016). Thus, PLCs development needs to take into account the local institutional and cultural context (Stoll et al., 2006). For example, based on the findings of Zhang and Sun (2018), PLCs in China are mostly moulded by their own culture and centralised education system. Therefore, greater studies on PLCs in various situations, as well as the impact on certain elements on PLCs practices need to be explored more in-depth.

The study aimed to investigate the development of PLCs implementation in High Performing Schools (HPS) and validate the PLCs practice model based on the PLCs instrument that was developed through the fuzzy Delphi method (Ismail et al., 2021). The study involved a pilot study and a field study. The Exploratory Factor Analysis (EFA) was employed using the pilot study data. Whereas the data from the field study were used to assess the level of PLCs implementation and validate the practice model using the Confirmatory Factor Analysis (CFA).

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Literature Review

Based on PLCs literature, the PLCs concept is still in the early stages of theory development (Soares et al., 2020). There is still no agreement on the true definition of PLCs (Tahir & Musah, 2020). There are various understandings of the concept of PLCs due to differences in the background of researchers of different cultures and countries (Zhang & Sun, 2018). Yet, most researchers agree that PLCs involves a group of teachers who learn together and strive to improve students learning (Olsson, 2019).

To better understand the differences of the PLCs concept, a summarised series of concept model development was listed that features various dimensions of PLCs based on different researchers as shown in Table 1. Table 1 shows that there are three main phases of the PLCs development model as stated by Warwas and Helm (2018). The first development phase contains 'five model components' and can be divided into two nearly identical but different segments. The first segment of the 'five components of PLCs' by Louis et al. (1996) consist namely of reflective dialogue, practice sharing, collaboration, shared norms and values, and collective focus on students learning. The second segment is Hord's (1997) study that is widely used by researchers namely sharing of practices, collective creativity, shared values and vision, shared support and leadership, and supportive structures.

The second development phase is an extension of the PLCs model which are additions of other PLCs dimensions. For an example, Bolam et al. (2005) found that the learning dimension is divided into two parts: individual and team learning. Other dimensions include membership and openness, networking, and partnership. The third development phase is the multidimensional structure of the PLCs model that integrates various dimensions which linked teachers' personal capacity and organisational capacity to form the dimensions of PLCs (Sleegers et al., 2013).

Table 1. Three Phases of PLCs Model Development from Different Researchers

Authors	Dimensions
	Initial Model
Louis et al. (1996)	1) sharing of norms and values, 2) collective focus of students learning, 3) collaboration, 4) sharing of practice, 5) reflective dialogue
Hord (1997)	1) leadership and mutual sharing, 2) sharing of values and vision, 3) collective learning and application, 4) sharing of personal practice, 5) supporting structures
DuFour and Eaker (1998)	1) shared mission, vision and values 2) collective inquiry, 3) collaborative teams, 4) action orientation and experimentation, 5) continuous improvement, 6) results orientation
	Extended model
Huffman and Hipp (2003)	1) Shared and supportive leadership 2) shared values and vision, 3) collective learning and application, 4) shared personal practice, 5) supportive conditions (structures), 6) supportive conditions (relationships)
Bolam et al. (2005)	1) sharing of values and vision, 2) collective responsibility, 3) reflective professional inquiry, 4) collaboration, 5) promotion of individual and team learning, 6) trust, respect, and mutual support, 7) inclusive membership, 8) openness, networking and partnership
	Multidimensional model
Sleegers et al. (2013)	A) Personal capacity; 1) active and reflective construction of knowledge, 2) currency, B) Interpersonal capacity; 3) shared values and vision, 4) collective learning, 5) shared practices, C) Organizational capacity; 6) resources, structures and systems, 7) relationships and climate, 8) stimulating participative leadership
Burns et al. (2018)	1) foundation to learning community culture 2) building leadership teams, 3) administrative leadership, 4) effective teams, 5) student learning, 6) assessment 7) system of intervention, 8) continuous improvement

From the table, a question arose about how many dimensions should be there for a PLCs model to operate effectively. Burns et al. (2018) mentioned that PLCs does not have a fixed number of dimensions and usually involves five to eight dimensions. For each of these dimensions, there are several elements to form the dimension. This makes the study of developing a PLCs model something complex and requires continuous research.

The results of the Delphi study by Ismail et al. (2021) discovered six different dimensions, where there are 21 elements with 121 PLCs practices. The first dimension is the visions, missions and values to enhance student learning which consists of four elements namely the construction of PLCs vision and mission, clear vision and mission statement, and the PLCs vision and mission is easily communicated and shared values. The second dimension is professional leadership referring to school leaders who provide professional support for teacher's collaboration. There are five elements which consist of learning leadership, distributed leadership, leaders develop human capital, leaders support teacher's learning, and leaders develop teacher's competency. The third dimension is collective and collaborative culture. This dimension has four elements namely collaborative learning, collective behaviour, continuous collaboration, and PLCs team. The fourth dimension is sharing of the best practices that has three elements, namely reflective dialogue, effective ways of

sharing, and innovation culture. The fifth dimension is a conducive school climate that consists of three elements: school resources, unrestricted school rules, and harmonious community relations. The sixth dimension is strategic alliances among stakeholders that consists of two elements: parents and family relationship and the individuals and expert group alliances.

Based on the PLCs practices listed from this instrument, PLCs is the collaborative and collective work of teachers in enhancing the teaching and learning of students and it is an ongoing practice that is supported by a conducive school climate, external relations, and professional school leadership. In practical terms, these practices are however not easy to occur in schools, as there are several barriers to the implementation of PLCs in schools. One of the barriers is school leaders are inefficient in distributing power and managing school's resources (Gill & Berezina, 2020). Moreover, poor school cultures such as teachers' unwillingness to share their practices (Huang et al., 2020) and teacher's workload that constrain teachers to collaborate (Chua et al., 2020). In addition, external contexts such as lack of collaboration between schools and other educational stakeholders can hinder the effective implementation of PLCs (Kin & Abdul Kareem, 2021).

In Malaysia, PLCs serves as the main platform for teachers to learn collaboratively and collectively to improve the teaching and learning process. Since 2011, the Malaysian Ministry of Education (MOE) has mandated PLCs to be adopted in all Malaysian schools to improve students' achievements (Ishak et al., 2020). Collaborative learning such as annual lesson planning, learning walks, time-sharing, peer observation, and action research are all part of the PLCs team activities. PLCs teams in Malaysian schools are structured by leadership sharing, appropriate school structure, and inquiry culture (Ismail et al., 2020). They provide opportunities for teachers to build and sustain PLCs teams in schools. Thus, PLCs in Malaysia demonstrates characteristics of mainly PLCs, including shared vision (i.e., focus on students learning), collaborative culture, and supportive environment (i.e., supporting leadership and organisational structures).

However, the local PLCs teams were not set up spontaneously by the teachers themselves but were set up based on the instructions of schools' administrators. Moreover, PLCs has been integrated into the assessment of teacher professional development by the MOE (2014). However, the study of Tahir and Musah (2020) discovered that informal knowledge sharing can make PLCs more effective. This informal collaboration can improve the knowledge and skills of teachers, as well as strengthen their relationship with each other. Therefore, the study was conducted to examine the implementation and validate the dimensions of PLCs practices in Malaysia.

Methodology

A cross-sectional study was conducted to collect data for both the pilot and field studies. The population of the study was HPS primary school teachers selected from fourteen states in Malaysia. Permissions to disseminate questionnaires were obtained from the education departments from all the states. Then, the questionnaires were distributed to schools via mail and Google forms.

Sample and Data Collection

The PLCs questionnaire consisted of 121 items (6 dimensions and 21 elements) developed through a fuzzy Delphi method to fit the local PLCs practice model (Ismail et al., 2021). The fuzzy Delphi method is an analytical technique for decision-making, which incorporates fuzzy theory within traditional Delphi methods (Murray et al., 1985). The expert panels of fuzzy Delphi method consist of 14 experts. In the first round, they have to rate and modify the items if necessary. The responses data were then analysed using the Excel software. Two conditions must be met in order to accept the items which are the value of threshold value (d) ≤ 0.2 (Cheng & Lin, 2002) and the expert consensus percentage ≥ 75% (Chu & Hwang, 2008). For the second round, the improvised questionnaire was returned to the experts for assessment and the results were reanalysed in the same manner as in the first round.

This fuzzy Delphi method yield the PLCs questionnaire, which was then used to investigate the level of PLCs practices. Each item of the questionnaire is rated with a five-point Likert scale: 1 = never, 2 = rarely, 3 = sometimes, 4 = very often, 5 = always. A pilot study using a simple random sampling technique was conducted to select a sample of 103 teachers in two HPS primary schools. As for the field study, it involved 386 teacher respondents selected through propositional sampling technique. The questionnaires were given to teachers of 25 HPS primary schools. Because of the difference in school sizes, the number of teachers who were the respondents from each school ranged from 10 to 25. In total, 400 copies of the questionnaires were given, and 386 valid samples were obtained with a useful return rate of 97.5 percent.

Analysing of Data

For the pilot study stage, data were evaluated using the Exploratory Factor Analysis (EFA). EFA was used to strengthen the instrument by assessing its reliability and construct validity and to develop the Malaysian PLCs practice model. At the field study stage, descriptive analysis using SPSS 25.0 software was conducted to find out the level of the implementation of PLCs and the Confirmatory Factor Analysis (CFA) using IBM-SPSS-AMOS 25.0 was conducted to validate the measurement model of PLCs.

EFA and CFA Procedure

The Exploratory Factor Analysis (EFA) was used to investigate the PLCs dimensions, elements, and items, whereas the Confirmatory Factor Analysis (CFA) procedure was used to validate the practice model. The data from the pilot study was used in the EFA, whereas the data from the field study was used in the CFA. The study used the PLCs questionnaire instrument developed through the Delphi study. The PLCs questionnaire instrument had high validity as a result of the Delphi method used. The instrument was also validated through a validation process (pre-test) by the panel of experts in the field of Malay language and educational management and administration. The involvement of different instrument evaluation expert groups resulted in more robust instruments (Sekaran & Bougie, 2016).

The EFA procedure analysed the loading factor for each item, showing the measurement for a construct. The minimum value of the accepted loading factor was 0.55 for newly constructed instruments with a minimum number of N = 100 (Hair et al., 2019). The Total Variance Explained (TVE) for each construct was calculated using the EFA. TVE was referred to as the number of items and their components that measured a construct. The minimum value for TVE was 0.60. The item and its components should be able to measure at least 60% of a construct (Hair et al., 2019). Cronbach's Alpha with a minimum of 0.6 was used to assess the items' internal reliability. Reliability refers to the extent to which the measurement model used is consistent in measuring the intended construct (Sekaran & Bougie, 2016).

Next, the study used a newly constructed questionnaire to collect the data from the field study. As a result of this data collection, it was used for two purposes. Firstly, to analyse the descriptive data in identifying the level of PLCs implementation. Secondly, to perform the CFA to validate the measurement model. Pooled CFA and parceling strategy were used because of the complexness of the model that consists of 119 items. The CFA determined the validity and reliability of the instruments (Awang, 2012). The three types of validity were construct validity, convergent validity, and discriminant validity (Baistaman et al., 2020). The reliability assessment was calculated using the composite reliability for each construct. A set of fitness indexes derived from the CFA process was used to determine the construct validity. There are three categories of fitness indexes that must be assessed: Absolute Fit, Incremental Fit, and Parsimonious Fit (Awang, 2012). Convergent validity was based on the Average Variance Extracted. Discriminant validity was based on the Chi-square test and the CFA was performed for a different type of measurement model by merging all the constructs. A significant of chi-square value differences confirmed that discriminant validity was achieved. A summary of the validity and reliability requirements is shown in Table 2.

Table 2. Summary of Validity and Reliability Assessment

Validity	Name of assessment	Acceptance Level
Construct Validity	Fitness Indexes:	
	Absolute Fit	RMSEA < 0.1 (Browne & Cudeck, 1993), SRMR < 0.08 (Hair et al., 2019)
	Incremental Fit	CFI, TLI, NFI > 0.9 (Hair et al., 2014)
	Parsimonious Fit	ChiSq/df < 0.5 (Marsh & Hocevar, 1985)
Convergent Validity	Average Variance Extracted (AVE)	AVE ≥ 0.5 (Hair et al., 2019)
Composite Reliability	Composite Reliability (CR)	CR ≥ 0.6 (Hair et al., 2019)
Discriminant Validity	Chi-square Test	Difference of chi-square value (Anderson & Gerbing, 1988)

Note: Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square (SRMR), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Normed Fit Index (NFI), Chi Square/ Degree of Freedom (ChiSq/df)

Findings / Results

Pilot Study: Exploratory Factor Analysis

The overall Cronbach's Alpha value for the questionnaire was 0.989 and the value for all elements ranged from 0.886 to 0.962 (Table 3). These values indicated a high level of internal consistency for all the items. The Spearman correlation of the elements ranged from 0.29 to 0.84, indicating that the items were related but not identical to each other.

Construct validity: The Kaiser-Meyer-Olkin result (KMO for each construct was between 0.852 to 0.932), indicated the adequacy of the sample. Furthermore, Bartlett's Test of Sphericity, (χ2 value was between 670.39 to 3613.28 with p <0.05) explained the appropriateness of factor analysis. Eigen values greater than one were used to identify the factors for each construct and varimax rotation was used to place each item to the most appropriate construct. All items had a load factor greater than 0.6. The result identified six dimensions and similar to the original instrument. Firstly, the Eigen value for visions, missions, and value dimensions had four elements extracted between 9.34 and 1.29, explaining 78.6% of the total variance with variance between 44.50% and 6.19%. Secondly, the professional leadership dimension had four elements with Eigen values between 1.00 and 17.93, with a total variance of 78.98% (variance between 3.58% and 64.04%). Thirdly, collective and collaborative culture had four elements with Eigen values between 14.25 and 1.10 with a total variance of 75.27% (variance between 4.43% and 57.01%). Next, the sharing of best practices dimension had

three elements with Eigen-values between 1.01 and 11.98 with a total variance of 79.79% (variance between 5.61% and 66.59%). Then, the conducive school climate dimension also had three elements with Eigen values between 1.29 and 10.35, with a total variance of 73.44% (variance between 6.79% and 54.52). Finally, the dimension of strategic alliances among stakeholders had two elements with Eigen values being 1.02 and 5.31 with a total variance of 79.13% and a variance of 12.80% and 12.80%, respectively.

This factor analysis resulted in a reduction of one element but all the items were maintained under the instructional leadership element (professional leadership dimension). There were only two items dropped from the instrument. Thus, the final version of PLCs consisted of 119 items with six dimensions and 20 elements.

Table 3. Elements of PLCs Dimensions, Eigen Values, Variance Explained, Cumulative Variance, Kaiser-Meyer-Olkin, and Reliability Values

Elements	Number of Items	Eigen values	% Variance explained	% Cumulative Variance	KMO	Cronbach's Alpha
Visions, missions, and values						
The construction of PLCs vision & mission (VM1)	7	9.345	44.50	78.56	0.852	0.949
Clear vision & mission statement (VM2)	5	4.168	19.85			0.941
Shared values (VM3)	5	1.686	8.03			0.886
PLCs visions & missions easily communicated (VM4)	4	1.299	6.19			0.913
Professional leadership						
Instructional leadership (PL1)	10	17.932	64.04	78.98	0.916	0.949
Learning leadership (PL2)	6	2.010	7.18			0.937
Distributed leadership (PL3)	7	1.173	4.19			0.958
Leaders develop human capital (PL4)	5	1.001	3.58			0.962
Collective and collaborative culture						
PLCs team (CC1)	8	14.253	57.01	75.27	0.913	0.952
Continuous collaboration (CC2)	7	1.864	7.46			0.912
Collaborative learning (CC3)	5	1.593	6.37			0.927
Collective behavior (CC4)	5	1.107	4.43			0.922
Sharing of best practices						
Reflective dialogue (SP1)	6	11.987	66.59	79.79	0.932	0.954
Innovation culture (SP2)	6	1.365	7.58			0.947
Effective ways of sharing (SP3)	6	1.010	5.61			0.933
Conducive school climate						
Harmonious community relations (CS1)	7	10.358	54.52	73.44	0.911	0.950
School resources (CS2)	7	2.305	12.13			0.910
Unrestricted school rules (CS3)	5	1.290	6.79			0.903
Strategic alliances among stakeholders						
Individual and expert group alliances (SA1)	4	5.306	66.33	79.13	0.863	0.928
Parent and family relationship (SA2)	4	1.024	12.80			0.889

Field Study

Teachers' Demographics

The respondents were a total of 386 teachers from 25 HPS primary schools from14 states in Malaysia. The teachers' backgrounds differ in terms of gender, race, age, highest academic qualifications, and teaching experiences. Among the respondents, 17.9% (69) were male, and 82.1% (317) were female. In terms of race, Malay teachers are the majority with a total of 346 or 89.6% of the total number of respondents. There are 30 Chinese teachers (7.8%). A total of 8 Indian teachers were involved in the study (2.1%). Other races were two people (0.5%). In terms of age, there were 147 respondents aged between 42 to 50 years old (38.0%) making them the largest percentage. Participants aged between 33 to 41 years old were 145 people (37.6%) and 57 people (14.8%) were aged between 51 to 60 years old. The remaining 37 (9.6%) were aged between 24 to 32 years old. In terms of their teaching experiences, there were 14.2% (55) who had not more than eight years of teaching experiences, 39.1% (151) with 9 – 16 years, 19.2% (74) with 17 - 22 years, and 27.5% (106) with more than 23 years of teaching experiences. Referring to their academic qualifications, 1.0% (4)

teachers hold a doctoral degree, 14.3% (55) with a master's degree, 74.1% (286) with a bachelor's degree, 9.6% (37) with a diploma, and 1.0% (4) with a certificate.

Levels of PLCs Practices

Table 4 shows the distribution of mean scores and standard deviations for the dimensions of the PLCs. The highest mean score of respondents was professional leadership (mean = 4.12, standard deviation = 0.613) and the lowest mean score was strategic alliances among stakeholders (mean = 3.71, standard deviation = 0.643). The overall level of all PLCs dimensions (mean = 3.98, standard deviation = 0.561) was at a high and satisfactory level of PLCs implementation.

Table 4. PLCs Practices Based on Teachers' Perspectives

Dimensions	Mean	Standard Deviations
Professional leadership (PL)	4.12	0.613
Collective and collaborative culture (CC)	4.11	0.495
Conducive school climate (CS	4.01	0.540
Sharing of best practices (SP)	3.96	0.544
Visions, missions and values (VM)	3.95	0.531
Strategic alliances among stakeholders (SA)	3.71	0.643
Overall Total	3.98	0.561

Confirmatory Factor Analysis

Construct validity was assessed based on three categories of fitness indexes. These fitness indexes were obtained from the CFA results as shown in Table 5.

Table 5. The Assessment for Construct Validity

Categories	Index Name	Index Value	Comment
1. Absolute fit	RMSEA	0.091	<0.1; Achieved
	SRMR	0.0429	<0.08; Achieved
2. Incremental fit	CFI	0.928	>0.9; Achieved
	TLI	0.912	>0.9; Achieved
	NFI	0.908	>0.9; Achieved
3. Parsimonious fit	ChiSq / df	4.214	<5.0; Achieved

The fitness index in Table 5 has fulfilled the construct validity requirement. Thus, it can be concluded that all dimensions are valid. Convergence validity and composite reliability were calculated using the factor loading for each element of the model. Table 6 shows the factor loading for each element and values of CR (composite reliability) and AVE (Average Variance Extracted).

Table 6. The Composite Reliability and Convergent Validity

Dimension	Elements	Factor Loading	CR (>0.6)	AVE (>0.5)	Convergent Validity
VM	VM1	0.618	0.814	0.526	Yes
	VM2	0.761			
	VM3	0.854			
	VM4	0.644			
PL	PL1	0.885	0.942	0.803	Yes
	PL2	0.874			
	PL3	0.910			
	PL4	0.914			
CC	CC1	0.814	0.900	0.693	Yes
	CC2	0.836			
	CC3	0.822			
	CC4	0.858			
SP	SP1	0.899	0.897	0.743	Yes
	SP2	0.855			
	SP3	0.831			
CS	CS1	0.831	0.867	0.684	Yes
	CS2	0.820			
	CS3	0.830			
SA	SA1	0.778	0.815	0.689	Yes
	SA2	0.879			

Next, the study employs the CFA on different measurements model to test on discriminant validity. The differences of chi-squares by merging all the constructs in a measurement model is as shown in Table 7.

Table 7. Measurement Model Comparisons for Discriminant Validity Assessment

No.	Measurement Model	Chi-Square	df	Chi-Square Differences	CFI	RMSEA
1	Six-Dimension measurement model	653.147	155		0.928	0.091
2	Five-Dimension measurement model	709.741	160	56.594	0.921	0.094
3	Five-Dimension measurement model	715.061	160	61.914	0.920	0.095
4	Five-Dimension measurement model	771.510	160	118.363	0.912	0.100
5	One-Dimension measurement model	1389.000	170	735.853	0.824	0.136

Notes: n=386, Model 2 merges CC and SP, Model 3 merges CC and CS, Model 4 merges VM and PL, and Model 5 merges all constructs. The differences of Chi -Squares are in relation to Model 1.

In Table 7, Six-Dimensional Measurement Model (proposed study model) has fitness index of Chi -Square = 653.147, df = 155, CFI = 0.928, and RMSEA = 0.091. While the One-Dimensional Measurement Model does not satisfy the fitness index with Chi -Square = 1389.000, df = 170, CFI = 0.824, and RMSEA = 0.136. The difference of Chi -Square between the Six-Dimensional Measurement Model and One-Dimensional Measurement Model is 735.853. This proves that there is a clear difference between all the constructs involved in the study. Next, the CFA was performed on different measurement models by merging two constructs namely the Five-Dimensional Measurement model; Model 2 (merges CC and SP); Model 3 (merges CC and CS), Model 4 (merges VM and PL). The results of the analysis revealed that the Six-Dimensional Measurement Model was better compared to other Five-Dimensional Measurement Models, thus fulfilled the discriminant validity.

Discussion

The study found that the PLCs instrument was appropriate for use to measure Malaysian school's functioning as PLCs which consist of six dimensions. In the light of this result, the study provides a discussion of validation process and dimensionality of the PLCs practice model. For the validation process, the reliability and construct validity scores in Exploratory Factor Analysis (EFA) were satisfactory for most dimensions. The EFA result confirms that the number of dimensions of PLCs is in the range of five to eight dimensions as suggested by Burns et al. (2018). The dimensions explained adequate amount of variance and provided sufficient factor structure. The results for Confirmatory Factor Analysis (CFA) also determined the validity of the measurement model which the fitness indexes were fulfilled. Furthermore, the results of discriminant validity also suggest two main points for PLCs structure. Firstly, all dimensions are correlated but each of them is unique. In addition, new developed PLCs instrument also have dimensions that are highly correlated to the ones found by the researchers such as Sleegers et al. (2013). Secondly, the PLCs structure consists of multidimensional constructs. Thus, this study is in line with the development phase of PLCs as mentioned by Warwas and Helm (2018). This means that researchers can explore interrelationships among the dimensions using any PLCs dimension based on their chosen theoretical framework.

As for the dimensionality, this study found that HPS primary teachers' practice every dimension of PLCs at a high and satisfactory level. There are some similarities and differences between each dimension when compared to the previous PLCs model in the literature. First, the dimensions of vision, mission, and values. Vision, mission, and values refer to people in the school sharing a vision and mission to improve student learning, pedagogical objectives, school improvement, and effectiveness. This dimension was also mentioned by other researchers who underlined that vision, mission, and values are needed to implement PLCs by involving school staff and other stakeholders (DuFour & Eaker, 1998; Hord, 1997). This suggests that PLCs act as learning communities where teachers collaborate to work and shape a culture to enhance teaching and learning for students through the sharing of vision, mission, and values (Zhang & Pang, 2016). In addition, DuFour and Eaker (1998) focuses the vision and mission towards enhancing students learning. However, in the case of this study, the vision and mission that is being built should be in line with the national education policy. Therefore, any decisions made in implementing PLCs by the school staff should adhere the rules of the education policy.

Second, the dimension of sharing of best practices has similarities with the models by other researchers despite having various names such as sharing of practice (Louis et al., 1996), shared practices (Sleegers et al., 2013), and shared personal practice (Huffman & Hipp, 2003). Sharing of best practices is a collaborative work in which members of PLCs engage in a dialogue that focuses on students and teaching. These collaborative discussions assist in identifying specific challenges, proposing solutions that enable the construction of new knowledge (Louis et al., 1996). The difference with the dimension of this study is that there is an element of innovation culture which consists of several practices such as encouraging teachers to participate in various innovation competitions, improving instructions through research findings and conducting innovation activities based on reflective practices.

Third, the dimension of collective and collaborative culture. This dimension is similar to other researcher models such as collaboration (Louis et al., 1996; Bolam et al., 2005) and collective learning and application (Huffman & Hipp, 2003). This dimension is important for members and fellow members of PLCs. A key similarity of this dimension is that collaboration in PLCs aims to achieve a common desire to engage staff through collaborative activities and dialogue (Bolam et al., 2005). On the other hand, PLCs of this study consists of PLCs teams divided into formal and informal practices for teachers to collaborate. PLCs teams' formal structure has been established in schools since 2011. The teachers' professional development (TPD) MOE policy has extended the implementation of PLCs to all schools by 2014 and teachers are given merit to get involved in PLCs (MOE, 2014). Informal practice sharing such as teachers' discussions through the PLCs network between schools and in the social media are also mentioned by Zhang and Sun (2018).

Fourth, the dimension of professional leadership. The obvious similarity of the PLCs model is the need for school leaders in PLCs. School leaders have a critical role in fostering professional development and sustaining improvements in practice (Sims & Fletcher-Wood, 2021). Supportive partnerships and leadership are interactions between administrators and teachers to shape collective decisions in a secure environment (Hord, 1997). Whereas Huffman and Hipp (2003) mentioned that administrators distribute power, authority and decision-making. This was highlighted in this study and it is the highest level of PLCs compared to other dimensions. It is likely that MOE's school leadership development program by Aminuddin Baki Institution is sufficient to increase the capacity of school leaders. Meanwhile, the difference is that there is element of leaders who focus on human capital development such as supporting teachers to develop self-competence, concerned with the welfare of teachers, and giving teachers the opportunity to reflect on themselves.

Fifth, the dimension of conducive school climate. This dimension is also related to other models such as supporting structures (Hord, 1997), supporting conditions-structures and relationships (Huffman & Hipp, 2003) and resources, structures, and systems (Sleegers et al., 2013). Examples of PLCs supporting structure are having time to collaborate, a place to meet and a media for teachers to communicate. In terms of relationships, it includes the openness to accept peer views and having trust toward each other (Huffman & Hipp, 2003). The difference in this study is that it suggests the unique type of relationship in PLCs. The eastern culture embedding in the socials of teachers and community emphasises a harmonious relationship. Harmonious relationship practices can be noticed among teachers such as teachers' concern for the welfare of their colleagues, respect for one's expertise, and openness to criticism to improve performances. This harmonious culture is also proven in the eastern PLCs literature such as Zhang and Sun (2018) which found that the school staff have strong emphasis on respecting the elderly. On the institutional context, unrestricted school rules ensure that teachers are not too tied to the hierarchy of the school system. Some of the unrestricted practices such as novice teachers are welcome to evaluate the teaching of excellent teachers to improve their teaching skills and school administrators are flexible in providing time for teachers to attend their Continuing Professional Development (CPD).

Sixth, strategic alliances among stakeholders. The similarity of this dimension with other models can be seen in the dimensions of supporting conditions-relationships (Huffman & Hipp, 2003), openness, networking and partnership (Bolam et al., 2005), and relationships and climate (Sleegers et al., 2013). This dimension involves how various stakeholders and local communities support the development of PLCs. In other words, the implementation and development of school PLCs is not only entirely dependent on internal processes and structures but also requires external factors and the involvement of stakeholder (Osmond-Johnson et al., 2019). For example, individuals and groups of experts support CPD by offering expertise in developing teacher competencies. The difference of the models is that the involvement of various stakeholders under one dimension. PLCs in this study is divided into two which are the parent-family element and the network of individuals and expert groups. This clearly shows the role of various stakeholders in the implementation of PLCs. However, this dimension achieved the lowest mean among all. This indicates school administrators should collaborate more with the stakeholders to promote PLCs in Malaysian primary schools.

Conclusion

The study clarifies the conceptual model of PLCs practices in Malaysian primary schools. PLCs in Malaysia can be operated with six different dimensions: visions, missions and values, professional leadership, collective and collaborative culture, sharing of best practices, conducive school climate, and strategic alliances among stakeholders. The study does not only add to the knowledge of PLCs dimensions from the local context but also suggests that PLCs is a complex job-embedded CPD with integrated dimensions. PLCs in Malaysia are hierarchically organic involving both top-down and bottom-up. Thus, this suggests the PLCs Malaysian model is partly distinct from others.

Recommendations

The recommendations of the study are as follows. Firstly, the survey only involved High Performing School teachers. Therefore, further studies should use samples from different types of schools such as low and medium performing schools, secondary schools, religious schools or private schools to confirm the findings from the study. Besides that, surveying on different types of schools should enable researchers to gain more insight of how the implementation of PLCs practices in these schools are carried out. Secondly, the PLCs instrument measures teachers' perceptions at the time of the survey. Therefore, triangulation methods of data collections such as interviews, focus group discussions may provide better insights into the PLCs development and achieve more accurate results. Thirdly, PLCs instrument can be

used by researchers who wish to employ advanced statistical modelling tools like Multilevel Models (MLM) and SEM to explore the relationship between school effectiveness, instruction, teaching, students' learning, or teacher's professional development.

Limitations

The study has several limitations. First of all, the respondents of the study only included high-performing primary school teachers and this does not reflect the overall Malaysian schools. This is because HPS are selected schools which the school staff practices high working culture. Thus, the findings of the study may cannot be generalised to all Malaysian schools. Secondly, validation of the PLCs model involves only EFA and CFA analysis. Therefore, the result of the analysis depends entirely on the conditions and procedures that need to be fulfilled by the researchers.

Authorship Contribution Statement

Ismail: Conceptualization, design, statistical analysis, writing. Ishak: Analysis, writing supervision. Kamaruddin: Editing and reviewing

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