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MODELLING PROFESSIONAL LEARNING COMMUNITY AMONG MALAYSIAN TEACHERS

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The main purpose of the study was to develop an empirically validated Professional Learning Community (PLC) among teachers in Malaysian primary schools. Structural Equation Modelling (SEM) utilizing AMOS Version 22 was employed to develop model. Exploratory Factor Analysis (EFA) was utilized to identify the underlying factors, whereas confirmatory factor analysis was employed to test the construct of the PLC. The study involved 450 primary school teachers from 5 zones in Malaysia represented by the states of Kedah, Selangor, Johor, Terengganu and Sarawak. Professional Learning Community Model (PLC) was found to be fit and reliable model with all fit statistics set well above the threshold level. The finding has also encouraged a fresh look at the implementation of PLC program aimed at successful change in schools. The findings of the PLC will also benefit educational practitioners in designing a teacher professional development for Malaysia.

Keywords: Education, Educational Administration, Professional Learning Community, Professional Development, Structural Equation Modeling

I. INTRODUCTION

Teachers are the agents of change for student achievement and school improvement. One strategic way to improving schools is fostering and promoting professional learning in which teachers develop their practice and build learning communities (Ho, Lee, & Teng, 2016). Teachers can group together to support teaching and learning classroom action research that aims at improving the quality of teaching practice (Vanderlinde & Van Braak, 2010). Researchers have conceptualized all these and similar practices as PLCs. Meanwhile, Malaysian Continuous Professional Development (CPD) for teachers clearly stated the PLC programme should be conducted in school to improve the quality and performance (Ministry of Education, 2014).

Indeed, PLC is an initiative and trend to improve quality of teachers, student achievement, and professional development among developed country (Chichibu, 2013; Dufour & Mattos, 2013; Pektas, 2014). The concept of PLC originally emerged from the concept of the teacher professional community which can be traced back to the 1980s. Later, another organizational feature, called organizational learning was added to the concept of a professional community, resulting in the coining of the term PLC (Senge, 1990).

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Successful implementations of PLCs enable schools to effectively address some of the problems that education in the twenty-first century faces. For instance, availability of effective professional learning communities is found to be a considerable driving force for building teacher and school capacity which is correlated with improved achievement for all students (Youngs & King, 2001). Through PLCs, teachers are provided with an access to resources and professional learning opportunities, which are necessary to restructure learning environments to meet the educational needs of their increasingly diverse students.

Thus, there is not much knowledge regarding current status of PLC and factors associated with its practices in Malaysia primary school context. This study, therefore, aims to assess PLC capability of Malaysia primary schools and explore factors and create the model that explain PLC model among Malaysian primary teachers.

II. THE ELEMENTS OF PROFESSIONAL LEARNING COMMUNITY

Shirley Hord's (1997) model of PLC is based into school improvement and school reform. Her work with the Creating Communities of Continuous Inquiry and Improvement (CCCII) project, which began in the mid-1990's, gave rise to learning more about promoting and nurturing learning communities (Hord, 1997). Hord also draws upon Senge's learning organization theory in her work with professional learning communities. According to Hord, there are five dimensions of a professional learning community: i) Supportive and shared leadership ii) Shared values and vision iii) Collective learning and application of learning iv) Supportive conditions v) Shared practice.

(A) Supportive And Shared Leadership

The school change and educational leadership literatures clearly recognize the role and influence of the educational administrator on whether change will occur in the school. It seems clear that transforming a school organization into a learning community can be done only with the sanction of the leaders and the active nurturing of the entire staff's development as a community. Thus, a look at the principal of a school whose staff is a professional learning community seems a good starting point for describing what these learning communities look like and how the educational administrator or principal accepts a collegial relationship with teachers. This new relationship forged between administrators and teachers leads to shared and collegial leadership in the school, where all grow professionally and learn to view themselves as all playing on the same team and working toward the same goal: a better school (Hoer, 1996; Hord, 1997).

(B) Shared Values and Vision

Vision is a trite term these days, and at various times it refers to mission, purpose, goals, objectives, or a sheet of paper post- ed near the principal's office (Isaacson

& Bamburg, 1992). Sharing vision is not just agreeing with a good idea; it is a particular mental image of what is important to an individual and to an organization. Staff are encouraged not only to be involved in the process of developing a shared vision, but to use that vision as a guidepost in decision making about teaching and learning in the school (Hord, 1997).

(C) Collective Learning and Application of Learning

Collective Learning is form Senge's paradigm shift was explored by educators and shared in educational journals, the label became learning communities. In schools, the learning community is demonstrated by people from multiple constituencies, at all levels, collaboratively and continually working together (Hord, 1997; Louis & Kruse, 1995).

(D) Supportive Conditions

Supportive conditions determine when and where and how the staff regularly come together as a unit to do the learning, decision making, problem solving, and creative work that characterize a professional learning community.Two types of conditions are necessary for learning communities to function productively: the physical or structural setup and the human qualities/capacities of the people involved (Hord, 1997; Louis & Kruse, 1995).

(E) Shared Practice

Shared Practice is shared personal practice among colleagues. Review of a teacher's behavior by colleagues is the norm in the professional learning community (Louis & Kruse, 1995). This practice is not evaluative but is part of the "peers helping peers" practice. Such review is conducted regularly by teachers, who visit each other's classrooms to observe, script notes, and discuss their observations with the visited peer. The process is based on the desire for individual and community enhancement and is enabled by the mutual respect and trustworthiness of staff members (Hord, 1997).

III. METHODOLOGY

A quantitative approach and survey research design was chosen for this study because the intent is to ask narrow objective questions generating quantifiable data that can be analysed using statistics (Cresswell, 2008).

(A) Population and Sample

The target respondents are among all the primary school teacher in Malaysia. The samples were selected using the multistage cluster sampling techniques. The study involved 450 primary school teachers from five zone areas of Malaysia represented by the states of Kedah, Selangor, Johor, Terengganu and Sarawak. This sample

saiz achieve the minimum sample saiz according to Krejcie & Morgan (Krejcie & Morgan, 1970). There is 112 (18.3%) from Kedah, 163 (26.6%) from Selangor, 114 (16.5%) from Terengganu, 101 (18.6%) from Johor and 122 (19.9%) from Sarawak.

(B) The Measurement Instrument

The instrument is adapt and modification from of the PLCA-R (Olivier, Hipp, & Huffman, 2010). Previous studies on the PLCA-R have gone through construct validity and have yielded satisfactory internal consistency for the subscales of the PLCA-R (Olivier, Hipp, & Huffman, 2010). The adaption and modification questionnaire consists of 52 items and five subscales: shared and supportive leadership, shared values and vision, collective learning and application, shared personal practice, and supportive conditions. The questionnaire as shown as appendix.

(C) Modeling Professional Learning Community

Five distinct approaches were applied to ensure the development and modelling PLC. First, the PLC was initially peer reviewed by the teachers and supervisors after systematically literature review. Second, ten face-to-face discussions with the expert including academician and practitioner. In fact, each subsequent instrument was constructed based on the preceding instrument. Some of the items were modified and redrafted based on the outcome of each discussion so as to ensure their precision and clarity. Third, a pilot study was conducted in order to assess the internal consistency reliability (Cronbach's alpha), and EFA procedure to explore the factor. Forth, a field study was conducted to run CFA, convergent validity and discriminant validity. Finally, this model successfully developed through all of the procedure.

(D) Pilot Study

A pilot study is regarded a significant approach in ensuring the reliability and validity of the instrument, and its adequacy (Saunders et al., 1997). Ambiguous items will be dropped in order to determine the validity and reliability of the research instrument (Johnson & Christensen, 2008). The instrument across all the items under each construct (Neuman, 2006). Low values of alpha would indicate that the items captured the construct poorly. Cronbach's alpha and item-scales for the PLC were calculated separately based on each construct. Cronbach for the three constructs of the PLC ranges from 0.871 to 0.958, and the item-scale for all items met the threshold of more than 0.7 (Cronbach, 1951). There is 14 items was deleted during the EFA. Therefore, all the 37 items were retained. The Cronbach alpha obtained implied that the overall reliability for the PLC was high.

(E) Reliability

TABLE I: CRONBACH ALPHA OF PLC

	Factors	*Item*	*Cronbach Alpha*
PLC	Shared Value and Vision	9	0.958
	Shared Supportive Leadership	9	0.942
	Supportive Condition	9	0.923
	Collective Learning Application	6	0.888
	Shared Practice	4	0.871
		37 item	

(F) Exploratory Factor Analysis

It was found that iterations of the EFA were necessary until individual components were formed. All the 37 items of the PLC were manipulated to Principal Component Analysis (PCA) utilizing the Statistical Package for the Social Science (SPSS) Version 20.0. Prior to operating the PCA, the fitness of data for factor analysis was determined. An investigation of the correlation matrix affirmed the existence of many coefficients of 0.5 and above. The Kaiser-Meyer-Oklin value was 0.884, which exceeded the recommended cut off value of 0.6 (Kaiser, 1974). The Barlett's Test of Sphericity reached statistical significance, which was $p < 0.05$, supporting the factorability of the correlation matrix, and indicated that the correlation between items was acceptable to run the factor analysis.

TABLE II: KMO AND BARTLETT'S TEST

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy. 0.884		
Bartlett's Test of Sphericity	*Approx. Chi-Square*	*3528.114*
	Df	666
	Sig.	.000

TABLE III: ROTATED COMPONEN MATRIX PLC

N=100. Rotated Component Matrix[a]

Number of items			*factor*				
		h^2	*1*	*2*	*3*	*4*	*5*
	Shared values and vision						
1.	Cb1.	0.62	0.69				
2.	Cb2.	0.76	0.77				
3.	Cb3.	0.91	0.84				
4.	Cb4.	0.83	0.81				
5.	Cb5.	0.74	0.68				
6.	Cb6.	0.81	0.69				
7.	Cb7.	0.84	0.77				
8.	Cb8.	0.76	0.76				
9.	Cb9.	0.79	0.73				

contd. table III

Number of items		*factor*					
		h^2	*1*	*2*	*3*	*4*	*5*
	Supportive and shared leadership						
10.	Ca1.	0.66		0.72			
11.	Ca2.	0.80		0.80			
12.	Ca3.	0.64		0.71			
13.	Ca4.	0.68		0.66			
14.	Ca5.	0.79		0.77			
15.	Ca6.	0.77		0.61			
16.	Ca7.	0.81		0.73			
17.	Ca8.	0.87		0.77			
18.	Ca9.	0.76		0.68			
	Supportive conditions						
19.	Cf1.	0.66			0.66		
20.	Cf2.	0.76			0.58		
21.	Cf3.	0.62			0.67		
22.	Cf4.	0.73			0.72		
23.	Cf5.	0.69			0.72		
24.	Cf6.	0.74			0.78		
25.	Cf7.	0.71			0.77		
26.	Cf8.	0.65			0.55		
27.	Cf9.	0.63			0.61		
	Collective learning and application of learning						
28.	Cc1.	0.62				0.55	
29.	Cc4.	0.69				0.74	
30.	Cc5.	0.81				0.85	
31.	Cc6.	0.80				0.81	
32.	Cc7.	0.68				0.71	
33.	Cc9.	0.70				0.68	
	Shared practice						
34.	Cd3.	0.75					0.78
35.	Cd4.	0.69					0.68
36.	Cd6.	0.74					0.74
37.	Cd7.	0.78					0.70
	Eigenvalue		17.1	3.8	2.2	1.7	1.5

(G) Normality

Prior to analysing the data, descriptive statistics were examined to check the normality of PLC model. Normally the data should be conducted to investigate how the standard of the data that has been collected so that the developing model may suit the parametric technique in the future research. Using Skewness and Kurtosis approach, our data is claimed to be highly significant indicating as normal data. Each item is ranging between -2 to +2 (Garson, 2012).

TABLE IV: MULTIVARIATE NORMALITY

Variable	*min*	*max*	*skew*	*c.r.*	*kurtosis*	*c.r.*
Cd4	4.000	10.000	-.285	-2.468	1.338	5.796
Cd7	4.000	10.000	-.290	-2.516	1.324	5.732
Cd6	4.000	10.000	-.232	-2.009	.816	3.533
Cd3	4.000	10.000	-.019	-.163	.354	1.531
Cc7	4.000	10.000	.019	.164	.919	3.979
Cc4	4.000	10.000	-.015	-.128	.210	.909
Cc6	4.000	10.000	.003	.029	.602	2.608
Cc5	4.000	10.000	-.321	-2.778	.842	3.644
Cf2	4.000	10.000	-.231	-2.003	.435	1.882
Cf1	4.000	10.000	-.441	-3.820	1.038	4.494
Cf3	4.000	10.000	-.466	-4.039	1.468	6.355
Cf4	2.000	10.000	-.679	-5.883	.391	1.695
Cf5	2.000	10.000	-.696	-6.031	.839	3.631
Cf6	2.000	10.000	-.692	-5.993	.582	2.520
Ca6	2.000	10.000	-.280	-2.427	1.957	8.473
Ca4	4.000	10.000	-.392	-3.391	1.368	5.924
Ca9	4.000	10.000	-.221	-1.915	.800	3.464
Ca1	4.000	10.000	-.892	-7.722	1.210	5.238
Ca7	2.000	10.000	-.467	-4.044	1.594	6.902
Ca5	4.000	10.000	-.475	-4.113	1.367	5.918
Ca8	6.000	10.000	.083	.722	-.162	-.702
Cb5	4.000	10.000	.118	1.024	-.054	-.235
Cb6	4.000	10.000	-.010	-.090	.126	.547
Cb9	6.000	10.000	.118	1.022	-.819	-3.545
Cb8	6.000	10.000	-.020	-.173	-.793	-3.433
Cb2	6.000	10.000	.166	1.440	-.764	-3.308
Cb7	6.000	10.000	.346	2.995	-1.027	-4.446
Cb4	4.000	10.000	.039	.337	-.059	-.257
Cb3	4.000	10.000	-.017	-.150	-.262	-1.136
Multivariate					474.695	114.905

(H) Convergent Validity

The convergent validity is the validation processes on measurement model. According to Kline (2011), convergent validity is a set of items in one construct are inter-correlation, at least, moderate in magnitude and is measured through average variance extracted (AVE) where the threshold is above >0.5 indicates a high convergent validity (Fornell & Larcker, 1981). Factor loading of each item at ≥ 0.6 considered high convergent validity (Hair et al., 2010). Table 5 showed all the AVE and factor loading achieved the minimum value for convergent validity.

TABLE V: FACTOR LOADING, AVE, CR AND "AVE

Item	*Factor*	*Factor Loading (>0.6)*	*AVE (>0.5)*	*CR (> 0.6)*	*√AVE*
Ca1	Supportive and Shared Leadership	0.715	0.720	0.959	0.848
Ca2		0.813			
Ca4		0.859			
Ca5		0.915			
Ca6		0.879			
Ca7		0.899			
Ca8		0.844			
Ca9		0.837			
Cb2	Shared Values and Vision	0.866	0.757	0.965	0.870
Cb3		0.906			
Cb4		0.896			
Cb5		0.906			
Cb6		0.819			
Cb7		0.891			
Cb8		0.8			
Cb9		0.808			
Cc4	Collective Learning and Application of Learning	0.795	0.697	0.902	0.824
Cc5		0.793			
Cc6		0.894			
Cc7		0.852			
Cd3	Shared Practice	0.791	0.687	0.897	0.828
Cd4		0.831			
Cd6		0.831			
Cd7		0.86			
Cf1	Supportive Condition	0.829	0.588	0.894	0.766
Cf2		0.867			
Cf3		0.82			
Cf4		0.697			
Cf5		0.682			
Cf6		0.682			

(I) Discriminant Validity

Table 6 showed that the diagonal value (in bold) are higher than any other values in its row and column. Thus, the discriminant validity for the PLC constructs was achieved. The discriminant validity is to avoid any redundant items in the measurement model (Zainudin, 2012). The items should not be related are in reality not related. It involves the relationship between a latent construct and other constructs of a similar nature. Discriminant validity can be identified by comparing the variance shared by the average AVE between these two constructs (Bove, Pervan, Beatty, & Shiu, 2009).

TABLE VI: DISCRIMINANT VALIDITY

Supportive and shared leadership	*Shared Value and Vision*	*Collective Learning and Application of learning*	*Shared Practice*	*Supportive Condition*
0.848				
0.66	0.870			
0.64	0.77	0.824		
0.62	0.70	0.72	0.828	
0.62	0.65	0.70	0.63	0.766

(J) Measurement Model of the PLC

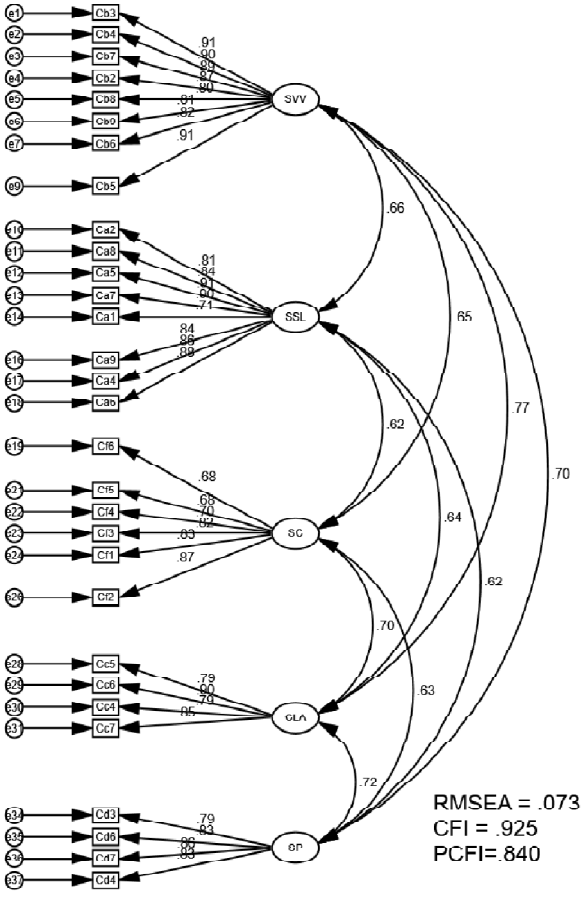


Figure 1: Order CFA

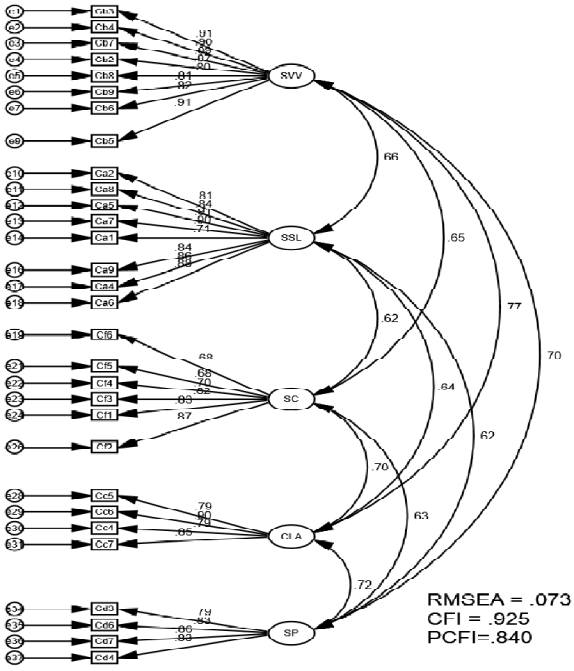
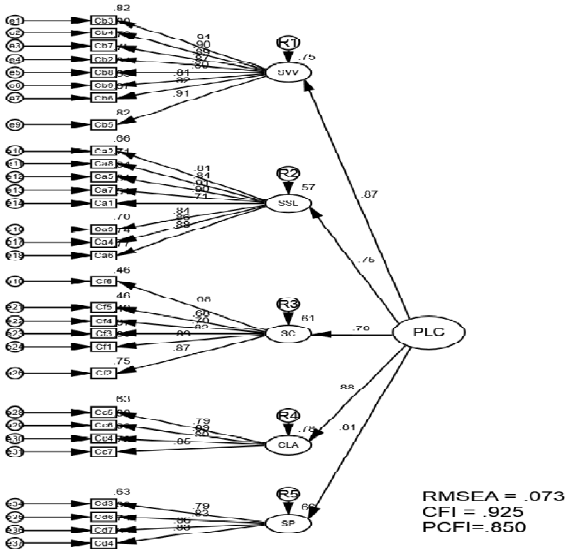


Figure 2: Order CFA



[a.] *Notes:* SVV: Shared Values and Vision, SSL: Supportive and Shared Leadership, SC: Supportive Condition, CLA: Collective Learning and Application of Learning, SC: Supportive Condition

IV. FITNESS INDEXES

In SEM, there is several Fitness Indexes that reflect how fit is the model to the data at hand. However there is no agreement among researchers which fitness indexes to use. Hair et al. (2010) and Holmes-Smith (2006) recommend the use of at least one fitness index from each category of model fit. There are three model fit categories namely Absolute Fit, Incremental Fit, and Parsimonious Fit. The value of fitness indexes used in this study is the RMSEA (absolute), CFI (relative), and PCFI (parsimonious) and this model was achieved the model indexes.

TABLE VII: MODEL FITNESS INDEXES

Model Fitness Indexes	*Finding*
RMSEA < 0.1	0.073
CFI > 0.9	0.925
PCFI > 0.5	0.850

V. FINDING AND DISCUSSION

School as a learning organization. From learning organization, PLC program was purposed to improve professional development among teachers. PLC's model successful developed empirically and the factors explored and defined. The measurement model demonstrates the causal relationship between the measuring items and their underlying latent constructs. The Confirmatory Factor Analysis (CFA) was employed to validate the measurement model of the latent construct. CFA procedure assesses whether the multiple-item measures of a latent construct are consistent with the researcher's understanding of the construct's nature.

The findings has explored and confirmed factor structure of PLC. It is revealed all dimensions of the PLC, such as Supportive and shared leadership, Shared Value and Vision, Collective Learning and Application of learning, Shared Practice and Supportive Condition in Malaysian context. In reality, there are the challenges for PLC implementation such as: 1) teachers' workload, 2) ambiguity of PLC processes and effectiveness, and 3) hierarchical work structure (Hairon & Dimmock, 2012). But with the suitable model, PLC implementation should be structured and effective. One of the significant contributions of this study is the model which describes the inter-relationships among the constructs

Factor Supportive and shared leadership has their own capacity. Supportive leadership is compulsory to create an atmosphere in which leadership capacity is developed for all community members. Shared leadership capacity empowers all members of PLC to share in the vision and mission of the school and make effective and real decisions that positively affect student learning and achievement. Factor Shared Value and Vision is connected by mission, focus, goals. A shared sense of the vision and goals of a learning community is assembled by its members, embedded in daily practice and visible to all. Such vision, focus and goals are

woven into the fabric of school and community life and are centered on the enhancement of student achievement, learning and growth.

Meanwhile, factor Collective Learning and Application of Learning is about collaborative relationships within the school community. There are centered on developing informed decision making and a knowledge base that positively influences practice. It emphasizes the cognitive processes that result from effective PLCs and the significance of working collectively with curricular outcomes, instructional processes and the best practices. Factor Shared Practice is about collaboration with colleagues and factor Supportive Conditions that are necessary in order to accept and embrace change within school communities are identified. This includes both logistical supports, such as scheduling and resources, and social and cognitive supports, such as opportunity, leadership and communication. Professional learning communities have been held up as powerful structures for teachers' continuing professional development. The factor shaped the PLC's model could guide the development of PLCs within the context of school improvement initiatives.

The question is about school preparedness for the implementation of PLC. The degree to which the PLC initiative is successful in practice is likely to hinge on two aspects in particular: first, teacher preparedness for the change (Hairon & Dimmock 2012), and second, the explicit onus on school leadership and organization to oversee and support the development of PLCs. With this tested model, the MOE could focused on key factors, structural and outcome elements in PLC. The importance to PLCs are more transformations than innovations, with holistic school re-design changing values, relationships, patterns of power and influence, school organization, and professional practices and school leadership playing a central part as change agent.

VI. CONCLUSSION

Initiating and sustaining the PLC model concept requires hard work. A school staff must focus on learning rather than teaching, work collaboratively on matters related to learning, and hold its members accountable for the kind of results that fuel continual improvement. When educators work hard to implement these principles, their collective ability to help all students learn will improve.

Meanwhile, the quality of school leadership is tested by the challenge of implementing and sustaining PLCs. Leaders build community around professional practice, and "finesse" the boundaries between government control and school-based initiatives. The importance of site-based leadership in motivating teachers, managing hierarchies, adopting creative ways to combat teacher work overload, and clarifying understandings, goals and benefits of PLCs assumes major significance in both centralised and devolved systems.

The study of these factors is important to clarify the strengths and weaknesses that should be considered by the school leaders and authorities. This will facilitate the relevant parties to measure for improvement in the event of weaknesses and to promote in order to be expended and implemented. In conclusion, this model of PLC will help in achieving the national vision and agenda of the national education policy.

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