

## **A REVIEW OF EXPLORATORY FACTOR ANALYSIS (EFA) OF PROFESSIONAL LEARNING COMMUNITY IN PRIMARY SCHOOLS IN MALAYSIA**

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### **ABSTRACT**

This study was conducted to adapt the Professional Learning Community instrument developed by Olivier, Hipp, & Huffman (2010) to be adapted for primary school teachers in Peninsular Malaysia. Therefore, the exploratory factor analysis (EFA) method was used to ensure that the adapted questionnaire was suitable for the teachers. This study was conducted during a pilot study involving 108 primary school teachers in Pahang. Through the exploratory factor analysis method, 35 items were successfully adapted for Malaysian teachers.

**Keywords:** Professional Learning Communities, Teacher Professionalism, Exploration Factor Analysis, Primary School Teachers

### **ABSTRAK**

*Kajian ini dijalankan untuk mengadaptasi instrumen Komuniti Pembelajaran Profesional yang dibina oleh Olivier, Hipp, & Huffman (2010) bagi disesuaikan untuk guru-guru sekolah rendah di Semenanjung Malaysia. Oleh itu, kaedah analisis faktor penerokaan (EFA) telah digunakan bagi memastikan soal selidik dapat disesuaikan dengan guru-guru. Kajian ini dijalankan semasa kajian rintis dengan melibatkan 108 orang guru-guru sekolah rendah di negeri Pahang. Melalui kaedah analisis faktor penerokaan, 35 item soal selidik berjaya diadaptasi untuk guru Malaysia.*

**Kata kunci:** Komuniti Pembelajaran Profesional, Profesionalisme Guru, Analisis Faktor Penerokaan, Guru Sekolah Rendah

## **INTRODUCTION**

Primary school teachers are an essential part of primary school education because they help to guarantee that education goes smoothly and successfully, resulting in pupils who meet national educational goals. Changes in the education system at the worldwide level also impact the national education landscape, and the change eventually manifests itself at the school level. The Ministry of Education (MOE) has taken various measures to enhance ongoing professionalism through state education agencies, regional education departments, and schools. The increasing workload of teachers has a significant impact on the quality of teaching and learning of teachers, job satisfaction as well as emotional stability (Nurul Atiqah & Faridah, 2021). Therefore, Teachers need to be responsible for improving and refining knowledge and skills in various ways whether provided by the school, MOE or through their efforts (Mohd Aizat & Kamarudin, 2020). The Professional Learning Community (PLC) is proposed in the Malaysia Education Blueprint 2013-2025 as a strategy for improving teacher professionalism through knowledge sharing among the school's community of teachers and staff. PLC culture in schools is a continual endeavour that can assist teachers in successfully and consistently improving their teaching (pedagogy) (Kementerian Pendidikan Malaysia, 2013). For a long time, PLCs have been utilised in developed countries to promote pedagogy among educators. PLCs should be executed uniform and consistent with creating the best impression of PLC culture. This is because, via the application of learning culture among all school community members, PLC may establish a high degree of learning culture among teachers (Hord, 2004).

## **PROBLEM STATEMENT**

Teachers' skills and knowledge should evolve over time, as their knowledge may become obsolete. As a result, the teacher development programme is expanding to generate instructors who can adequately carry out their responsibilities. Teachers have been taught a variety of strategies to improve their teaching professionalism, Teachers are advised to use lectures, demonstrations, observations, interviews, brainstorming, group discussions, and role play. which includes three aspects: professionalism, knowledge, and skills. Lectures, demonstrations, observations, interviews, brainstorming, group discussions, and role play are among the tactics suggested to teachers. One of the principles of teacher education in services, or better known as the development of teacher professionalism, is the application of these norms (Amin, 2008). In the Malaysia Education Blueprint 2013-2025 (MEB), the Ministry of Education Malaysia (MOE) recommended a Professional Learning Community (PLC) to support teachers in enhancing their knowledge and understanding.

PLCs have begun to be used in Malaysian schools, and schools can build PLC practises in their own schools and demonstrate favourable results when the PLC dimensions have a high mean score. (Zuraidah, 2009). This suggests that teachers use PLC practices in their classrooms, but it is not clear whether PLCs can solve the above problems. For example, teachers who like to work alone and do not know the knowledge and skills knowledge, skills and attitudes that do not help improve professional skills. Therefore, to ensure that PLC can help primary school teachers, especially in teacher professionalism, this study must adapt the Professional Learning Community questionnaire instrument as a test tool to empower PLC in line with Malaysia. Education Development Plan 2013-2025.

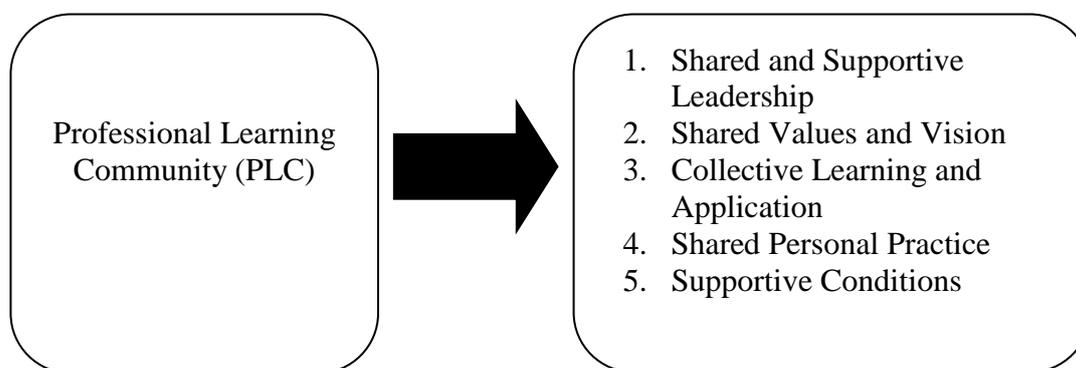
## **Research Objective**

The purpose of this study is to use the Exploratory Factor Analysis (EFA) method to adapt the Professional Learning Community Assessment-Revised (PLCA-R) questionnaire to primary school teachers in Peninsular Malaysia.

## Research Question

Is Exploratory Factor Analysis (EFA) able to form a questionnaire tailored to primary school teachers in peninsular Malaysia?

Figure 1: Conceptual Framework



**Table 1:** The Dimension of the Professional Learning Community Model

No	Dimension	Description	Source
1.	Shared and Supportive Leadership	Some empirical research have clarified the commitment of school administrators who are responsible for establishing, supporting, and maintaining active PLCs in their schools.	(Hord, 2004)
2.	Shared Values and Vision	The key to PLC's success in the classroom is for leaders, instructors, and students to share missions and visions in order to preserve the learning culture.	(Hord, 2004)
3.	Collective Learning and Application	If instructors were given the opportunity to cooperate, they would learn more and become more dedicated to their students and professions.	(Rosenholtz, 1989)
4.	Shared Personal Practice	Teachers exchange ideas on how they educate and observe how other teachers teach. Teachers also provided their observations and feedback on sharing and teaching strategies.	(Dima Mazlina, 2015)
5.	Supportive Conditions	A professional learning community's supportive conditions are where, when, and how personnel frequently gathered as units for learning, decision-making, problem-solving, and creative work.	(Hord, 2004)

## LITERATURE REVIEW

### *Professional Learning Community*

In recent decades, PLC has strengthened education from primary to university level and has brought many benefits. Teachers benefit from a PLC because it fosters professional development, collaboration, and innovation. Studies show that when teachers are involved in PLC, schools will experience positive reform and improve students' performance as a by-product (Brown, Horn, & King, 2018; Wilson, 2016). To achieve a successful PLC, teachers must have a shared vision in mind and plan to achieve that goal (Botha, 2012). The shared values and visions conveyed by teachers represent specific principles relevant to students' teaching and learning process. Values and vision are seen as the focus of overall quality. In other words, PLC aims to attract and develop the talents of all students (Krutka, Carpenter, & Trust, 2016) and enhance the teaching profession (Lee, Sachs, & Wheeler, 2014). It can indirectly affect the higher effectiveness and reliability in the functioning of

modern educational institutions (Strunga, 2015). Teacher discussions in the PLC allow for a focus on learning rather than teaching alone and increase the accountability of all stakeholders. Administrators need to be involved in the learning process of teachers to ensure cooperation between all members of the school runs smoothly. PLC determines what students will learn, how teachers know they have learned, and how PLC groups can help weaker students (Easton, 2015).

The PLC was also created to strengthen the school's systematic approach by standardising the content and assessments that students are exposed to in general. The PLC's main principles concern the process of ensuring that students learn, which shows the gradual shift from excessive teaching to learning with a profound comprehension of specific subjects (Garmston & Wellman, 1999). Flexible, collaborative cultures have been identified as crucial building elements in PLCs and training communities. Teachers work together as a team to create a positive social and discipline atmosphere in the classroom, reflecting widespread improvements in the school environment (Wald & Castleberry, 2000). The importance of focusing on the decision has been acknowledged as an important part of society, with the current level of student achievement and specific goals for future progress being highlighted. Because of the emphasis on broad collaboration, the collective ability to help everyone learn will increase (Popp & Goldman, 2016).

### *Exploratory Factor Analysis*

EFA investigates the relationship between variables and factors without making any assumptions about which variables are associated to which factors (Everitt & Hothorn, 2011). Factor analysis was used to test the validity of the constructs in the questionnaire. Construct the researcher conducted validity before conducting the item reliability test. It is because a high Cronbach's alpha value does not mean the study instrument is suitable. After all, the instrument is invalid (Ghazali & Sufean, 2018). EFA is a multivariate statistical method that has become a fundamental theoretical validation and psychological measurement (Watkins, 2018). The purpose of the EFA is to identify the factor structure for a set of variables (Pituch & Stevens, 2016). There are six steps in implementing the EFA, and the steps are as follows:

1. Data cleaning.
2. Decide on the extraction method used, and the researcher chooses the method of "Principal Components Analysis" (PCA).
3. Decide how many factors need to be retained.
4. Decide on the rotation method, and in this study, the researcher uses varimax rotation.
5. Interpret the results (return to step three if the solution is not appropriate)
6. Replication or durability assessment (go back to the beginning of the solution is not replicable or robust).

### **Research Methodology**

The research was carried out in a quantitative manner. The pilot study was conducted using the questionnaire method. For this pilot study, 108 teachers from Pahang were chosen at random. These instructors work in a primary school setting. The questionnaire survey method is widely used in research in a variety of sectors, including social science and education (Chua, 2012; McMillan, 2012).

### **Research Population**

The participants in this study are teachers who work for the Malaysian Ministry of Education (MOE) at elementary schools in Peninsular Malaysia. According to teacher forecasts given from the Ministry of Education in 2019, Peninsular Malaysia had a total of 184,486 primary school teachers. Pilot studies were undertaken before to the real survey to test the reliability and validity of the research

instrument to be used. This is to avoid misunderstandings and to highlight the built-in things' flaws (Creswell & Creswell, 2018).

### **Research Instruments**

The questionnaire was built by Olivier, Hipp, and Huffman (2010) namely Professional Learning Community Assessment-Revised (PLCA-R). This questionnaire comprised 56 items, with seven to eight items in each dimension, allowing respondents to express their thoughts on the professional learning community (PLC) in their schools. Each item is scored on a Likert scale ranging from one to four, with one indicating that the respondent strongly disagrees with the statement and four indicating that the respondent strongly agrees with the proposition as expressed in the questionnaire. Because researchers encourage respondents to commit to either positive or negative scales and avoid neutral, the Likert scale employs an equal number of points, such as four. In educational and social science research, the likert scale is one of the most basic and widely used psychometric tools. (Joshi, Kale, Chandel, & Pal, 2015).

### **Research Procedures**

The questionnaire developed by Olivier, Hipp, dan Huffman (2010) sent to selected teachers as respondents of the study. The respondents are teachers who have been in services for three years and permanent teachers. The questionnaires that have been completed has been retrieved and analyses with SPSS. Teachers who participate in this pilot project will not participate in genuine pollution-prevention studies (Chua, 2012).

### **Data Analysis**

The data obtained from the pilot study were analysed using SPSS, and the researcher conducted the exploration factor analysis process.

### **Research Findings**

The total number of items before the Factor Exploration Analysis (EFA) was conducted was 56 items and after the EFA was conducted a total of 21 items were dropped. Items were dropped because they were not correlated to form single constructs in the questionnaire (Ghazali & Sufean, 2018; Hair, Black, Babin, & Anderson, 2010). Items and the reasons for items being dropped are set out in table 2. The procedure of dropping these items is that by dropping items that do not meet the loading factor value requirement, all items less than 0.6 are dropped (Awang, 2015; Pituch & Stevens, 2016).

**Table 2:** The Reason The Item Was Dropped

Items	Reason
PLC47, PLC54, PLC55	It does not belong to the supposed factor
PLC12, PLC13, PLC14, PLC20, PLC21, PLC22, PLC23, PLC28, PLC29, PLC40, PLC42, PLC43, PLC44, PLC45, PLC46, PLC52, PLC53, PLC56	The value of the loading factor is less than 0.6

**Table 3:** KMO Schedule and the Bartlett Test of the Professional Learning Community

<b>KMO and Bartlett's Test</b>		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.893
Bartlett's Test of Sphericity	Approx. Chi-Square	6306.509
	df	1540
	Sig.	.000

**Table 4:** Rotated Component Matrix Professional Learning Community Variables Varimax Methods and Item Uniformity Values

N=108. Rotated Component Matrix							
Item		$h^2$	Factor				
			1	2	3	4	5
<b>Collective Learning and Application</b>							
1.	PLC24	The good relationships that exist among teachers reflect their commitment to improving the quality of the school.	0.67				
2.	PLC25	Teachers work together to find solutions to meet the various needs of students.	0.73				
3.	PLC26	Various opportunities exist for collective learning.	0.75				
4.	PLC27	Various structures exist for collective learning. (Example: good relationship between teachers)	0.71				
5.	PLC30	Professional development focuses on teaching and learning.	0.65				
6.	PLC31	Teachers learn together in applying new knowledge to solve problems.	0.62				
7.	PLC32	Teachers are committed to the learning program.	0.73				
8.	PLC33	Teachers collaboratively analyse a variety of data sources to evaluate the effectiveness of their teaching practices.	0.74				
9.	PLC34	Teachers collaboratively analyse students' assignments to improve teaching and learning.	0.73				
<b>Shared and Supportive Leadership</b>							
10.	PLC1	Teachers are involved in decision-making discussions on most school-related issues.		0.66			
11.	PLC2	The Headmaster incorporates all the suggestions given by the teachers before making a decision		0.83			
12.	PLC3	Headmasters provide a database for teachers to access important information.		0.69			
13.	PLC4	The Headmasters is proactive.		0.80			
14.	PLC5	Headmasters prioritize key needs to enhance student learning		0.74			
15.	PLC6	Opportunities are provided for teachers to initiate change.		0.76			
16.	PLC7	Headmasters reward for innovative actions.		0.80			
17.	PLC8	Headmasters share responsibilities with teachers.		0.73			
18.	PLC9	Headmasters share power with teachers.		0.71			
19.	PLC1	Headmasters make decisions based on the agreement of school management members.		0.86			
20.	PLC2	Headmasters reduce red tape in decision making.		0.82			

**Supportive Conditions**

21.	PLC48	Timetable design encourages collective learning and sharing of teaching practices.	0.60
22.	PLC49	Financial resources are available for professional development.	0.74
23.	PLC50	Appropriate technology materials and teaching aids are available for teachers.	0.68
24.	PLC51	Expertise resources are available to support continuous learning.	0.72

**Shared Values and Vision**

25.	PLC35	Opportunities exist for teachers to observe colleagues and open up room for improvement.	0.69
26.	PLC36	Teachers provide feedback to their colleagues on teaching practices.	0.66
27.	PLC37	Teachers share ideas and opinions informally to enhance student learning.	0.61
28.	PLC38	Teachers collaboratively analyse student assignments to share and improve teaching practices.	0.67
29.	PLC39	Opportunities to be mentors and coaches exist at this school.	0.71
30.	PLC41	Teachers make assessment of student performance as one of the methods of enriching school data	0.66

**Shared Personal Practice**

31.	PLC15	Teachers share a vision in school development that focuses on student learning.	0.68
32.	PLC16	Decisions are made in line with the values, vision and mission of the school.	0.73
33.	PLC17	The vision and mission of the Professional Learning Community is built together by the school community	0.66
34.	PLC18	The vision and mission of the Professional Learning Community focuses on improving student learning over academic performance	0.70
35.	PLC19	The vision and mission of the Professional Learning Community is in line with the school program (Example: NILAM Program)	0.64

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\* $h^2$  = Communalities

**DISCUSSION AND IMPLICATION**

The researchers discovered five characteristics from the professional learning community using factor analysis. Table 4 lists the first factor as collective learning and application, the second as shared and supportive leadership, the third as supporting conditions, the fourth as shared values and vision, and the last as shared personal practise. The closer the value of commonalities is to 1.0, the better our factors describe an item (Field, 2017) and they should exceed 0.3 (Tabachnick & Fidell, 2012). While the eigenvalue is more than 1.0, as suggested by Hair et al. (2010). The total number of variances described is 70.67%, and each factor has four to nine items and achieves a minimum of three items per factor as suggested by scholars, as this number yields a reliable solution (Marsh, Hau, Balla, & Grayson, 1998).

## CONCLUSION

Overall, this study discusses the methods to use exploration factor analysis in adapting the Olivier, Hipp, & Huffman (2010) questionnaire to suit Malaysian teachers, especially primary school teachers in peninsular Malaysia. After the exploration factor analysis was conducted, there were 35 items of questionnaires that were suitable to be used for the researcher to conduct the actual study level study involving 384 teachers who were randomly selected.

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