

# Exploratory and Confirmatory Factor Analysis on the Values Aspects of Teacher Leadership Model

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**Abstract** Teacher leadership is gaining momentum in the school improvement program nowadays. School reformation depends on teacher leaders' ability to implement new approaches and help colleagues develop their skills, values, and expertise. Thus, this study aimed to develop and validate the teacher leadership instrument to measure the aspect of value using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), which has 31 items. The data were analyzed using Statistical Packages for the Social sciences version 22 and Structural Equation Modelling version 20.0. This study was administered to 320 teachers in 19 secondary schools in Kuala Lumpur, Malaysia, using questionnaires. The Exploratory Factor Analysis (EFA) yielded a 29 items three-factor model termed as Being a Consultant (PR), Fostering a Cooperation Culture (MBK), and Leading the Teaching and Learning Process (PPdP). The Confirmatory Factor Analysis yielded 17 items demonstrating three factors that achieved the model fit index, with Chi-squared/degree of freedom ( $\chi^2/df$ ) = 2.541, Tucker-Lewis Index (TLI) = 0.934, Comparative Fit Index (CFI) = 0.944; and Root Mean Square Error of Approximation (RMSEA) = 0.070. The composite reliability and average variance extracted of the domains ranged from 0.54 to 0.57 and 0.85 to 0.89. The study found that the instrument is valid and reliable in measuring the values aspect of teacher leadership models. This model's development can have a huge impact on teachers' leadership training through the teachers' professionalism improvement programs.

**Keywords** Teacher Leadership Values, Teaching and Learning, Cooperative Culture, Teacher as a Consultant

## 1. Introduction

Teachers act as the core in determining the success of the implementation of the national curriculum. Educators or teachers are not only responsible for delivering knowledge to their students, but they are also responsible for making sure their students have good manners [1]. Teachers with positive self-values can influence the school's teaching and learning environment and make a significant impact on students' learning process [2]. These farsighted, virtuous, and positive thinking teachers will improve the students' quality and increase school performance at the same time [3]. Moreover, the teachers' adhering to the code of ethics as educators and decent manners will make them carry out their responsibility as educators with dedication [4].

Teachers with higher cognitive skills and excellent personality will be great role models for them [5]. Teachers are also an essential agent of change in developing individuals' physical, intellectual, emotional, and social potential [6]. Hence, teachers with low self-esteem will have a lower motivation to carry out their entrusted responsibilities. To overcome these problems, teachers must have substantial values and identity within themselves. According to Zakaria et al. [6], teachers should

practice and appreciate values first before educating the children. This finding is in line with the statement made by Lickona [7] that described teachers as role models in values. They must act as guardians, models, and mentors to the students. They also need to create a moral community, practice the righteous discipline, build a democracy class, teach values across the curriculum, use cooperative learning, build conscience of craft, foster concern beyond the classroom, and build a positive culture in the school cooperated with the parents.

Teachers need to have leadership values such as excellent personal characteristics, perfect stature, and special characters in conveying general knowledge and ethical character education [8]. A study by Nik Aziz [9] mentioned that teachers must have an excellent moral, intellectual, emotional, creativity, motivation to teach, mentoring skills, and outstanding leadership skills in the classroom to make the learning process more effective. According to a study by Apidah [10], teachers play a vital role in educating and shaping student's morals and values. Gamal [11] explained that because teachers' behaviors are always observable, they should show excellent behavior to their students and their colleagues. They also must equip themselves with essential knowledge and noble characters to their students. Thus, teachers with exceptional leadership values can carry out their duties as educators successfully [12].

Lambert et al. [13] stated the new teachers lack awareness, skills, knowledge, and values to become teacher leaders. According to Johnson [14], long serviced teachers always gave excuses for the lack of exposure to teacher leadership skills in teachers' training college to fulfil their respected responsibilities. This assertion is supported by Dozier [15], who did a survey on teacher leaders in Virginia and found that 82% of the respondents said that they did not undergo any training on teacher leadership in teachers' training institutions. Bond [16] stated that the teacher leader must start from the future teachers who are still undergoing teachers' training at the college. A recent study by Huggins et al. [17] found that teachers failed to see themselves as leaders in the community. Most of them said that they did not receive proper training in teacher leadership; therefore, they did not have a clear understanding of what teacher leadership entailed and unsure of the impact of a better leader, which will make them better teachers.

Wenner [18] stated that a study in teacher leadership is still scarce in the literature. There is no comprehensive review in this scope; even there is a tremendous change in policy and other influences resulting in educational changes. Study about teacher leadership focused on narrow aspects of the field. Although teacher leadership is viewed as a crucial component in the success of teaching and learning [19], there is little literature on teacher leadership development [20]. There are not many studies that are

explicitly done on teacher leadership values, either locally or abroad. Mostly all the previous studies focused only on the principals or administrators.

The teacher leadership field's research enhanced the Ministry of Malaysia Education's insistence to produce more professional teachers who have better qualities, higher self-values, more knowledgeable, and have excellent skills. This effort is necessary because education is the instrument for processing, forming, nurturing, encouraging, building, and shaping the younger generation's face that can contribute to their country [21]. The continually changing system in Malaysian education increases the teacher's workloads, and therefore, it can demotivate teachers to perform. In recent years, too many crises involving teachers have become the national agenda. Indirectly, the issues and problems that arise have affected the teaching profession itself. The teachers faced criticism from the public, such as the leakage of 2014's *Ujian Pencapaian Sekolah Rendah* (UPSR) question paper. The crowd began to question the integrity of the teachers [22]. This situation is preventable if teachers have high integrity towards their profession. Therefore, this study aimed to develop a teacher's leadership value model that can be applied to the existing model of teacher's leadership. This added value can be served as guidance to teachers worldwide, especially in Malaysia, to practice these values in the classroom.

## 2. Literature Review

The definition of teacher leadership is very complex [23]. York-Barr and Duke [24] defined teacher leadership as a process where experienced teachers will influence their colleagues and other members in the school society, improve the way students learn, and improve the teaching methodology in the classroom. Katzenmeyer and Moller [25] defined teacher leadership as a teacher who leads within and beyond the school, contribute to a community of teachers-learners and leaders, and influence other teachers to improve their educational practice. Most researchers agree that teaching and learning will improve these leadership skills, create a better school environment, and increase professionalism in the teacher's profession [26].

Teacher leadership is a tool to support school-wide improvement [24],[27],[28]. Teachers must have commendable attitudes to lead the students to become better human beings. According to Ismail [29], the teachers' personal quality is essential as the teachers are the source to be emulated in the construction of moral values. Although various efforts made to define teacher leadership and diverse literature supported the concept of teacher leadership as a central focus in the school improvement program, Heltzer [30] and Brennerman

[31] stated that this message had not reached every teacher widely. Therefore, the Ministry of Education Malaysia had made an effort to enlist six core values that must be followed by every teacher.

The six core values enlisted by the Ministry of Education Malaysia are trustworthy, diligent, thinking, caring, knowledgeable, and virtuous [22]. In comparison, there are seven core values in MOE's working ethics: trust, discreet, dedicated, loving, truthful, thankful, and sincere. The guidelines of these values should be implemented and internalized based on the five principles of working ethics of teaching, namely having the right intentions, good manners, driving towards the good, keeping up the words, disciplined and civilized. These values will make teachers behave, think, and act appropriately [32].

Therefore, in this study, teachers value refers to the positive personal traits showed by the teachers either directly or indirectly. These teacher leadership values also refer to the teachers' characteristics to influence others informally to achieve their goals. There are six proposed earlier constructs to represent teacher leadership values in the Malaysian context which are Leading Teaching and Learning Process (PPdP), Being A Follower (MI), Involving Actively in The Organization (KAoO), and Fostering Cultural Cooperation (MBK), Connecting to The Community (JK) and Being A Consultant (PR). The constructs are developed based on the Rokeach Theory [33], the Theory of Schwartz [34], The Twelve Pillars [35], and Malaysian Teachers' Standard [36].

### 2.1. Leading Teaching and Learning Process (PPdP)

In this dimension, the teacher acts as a leader in the teaching and learning process. It refers to the teacher's primary responsibilities to educate the students. The teachers educate the students by imparting knowledge to them and emphasizing the students' personality and moral development. Therefore, the teachers' behaviors as a role model to the students are critical [4]. Teachers should always discard their selfishness and prioritize the students' interests and welfare [37]. According to Zenger and Folkman [38], teacher leaders must be humble and honest in building positive relationships between teachers and students.

Teachers need to plan earlier before execute the teaching and learning activities. This prior planning will ensure the students will benefit more in the teaching and learning sessions. It will serve as a guide to the teacher's reaction in the classroom. According to Macnab and Payne [39], teachers' attitudes in the classroom will strongly influence classroom practices. Therefore, teachers' values are crucial as they will guide the teachers to understand the responsibilities they have to fulfil in the classroom. This construct showed that teachers act as a facilitator in the classroom and as the person who can

bring changes to the student's life. These changes do not only happen in the classroom but also around the school environment and society. This sub-construct coincides with the six core values listed by Schwartz [34] and Rokeach [33], which describes the instrumental values.

### 2.2. Being a Follower (MI)

The dimension Being a follower (MI) in this study refers to the teachers' attitudes and behaviors directed by the people around them. Teachers' behaviors always show the values of open-minded, respect others' views, and often exhibit confidence and assertiveness [40]. These behaviors make them fit as a teacher leader. Moreover, teacher leaders must have a flexible attitude, be willing to try different approaches to solving problems, be bold enough to take risks and be role models to the students [41].

Teacher leaders also showed excellent leadership values and ethics to develop students' skills, train them to be more creative and innovative, adept in decision-making, and motivate them to excel [42]. Teachers who always show mutual respect to their colleagues and students had a high possibility of serving and loving the students, having more resilience and motivation to produce better students [16]. Therefore, being a follower or able to influence others is an essential process in teacher leadership. As described earlier, the teacher leaders who have good and positive values will quickly affect the students and colleagues to meet the specified goal, especially in strengthening the organization [43].

### 2.3. Involving Actively in the Organisation (KAoO)

In this dimension, the teachers' active involvement in the organization means the teacher's behaviors to carry out their responsibilities in the organization. These behaviors include the teachers who are brave enough to face the challenges, independent of carrying out their duties, and able to guide their colleagues towards excellence [44]. In a study on *Teacher Leadership, Collective Efficacy and Trust in School* by Angelle, Nixon, Norton, and Niles [45] found that teacher leaders have a significant impact on the organization's development as it goes beyond the role and responsibility of an individual teacher.

A study by Hope-Arlene [46] listed several things that can be practised by the teachers which are; i) involving in the decision making and leadership at the school; ii) discussing the planning on the school improvement, iii) focusing on professional development, iv) providing a space for the teachers to develop their talents, v) having an excellent communicating skills and vi) being able to collaborate with other teachers. Whereas, Suranna and Moss [47] identified the leadership characteristics that should be owned by every teacher leader, namely;

involved in the process of professional development; increase professional knowledge sharing; have their stand on education issues, and act as a facilitator. Through these opportunities, teachers should be bold to face challenges and overcome the weaknesses in themselves. Therefore, these opportunities must have strong support from the principals and headmasters to ensure that teachers are equipped with all these qualities.

#### 2.4. Fostering a Cooperation Culture (MBK)

Fostering a collaborative culture in this study refers to the teachers' dedication and commitment to carrying out their duties in collaboration with other teachers. The teachers who have these values are often interested in their works, willing to sacrifice their time and efforts to deliver high-quality works, and also willing to help and guide their colleagues, especially the newcomers [47]. They will also be willing to share their knowledge, skills, and techniques in the teaching and learning process and have a high awareness of the latest development in education. These behaviors will indirectly raise the teacher's confidence in carrying out their entrusted task [48].

A study by Dahlgren and Chiriach [49] found that teachers admitted that their job requires them to work as a team. Gregory [50] stressed that the difference in teacher learning outcomes is caused by the teachers' negative or positive responses against their team members. Thus, the culture of cooperation or teamwork affects their learning ability. The strong influence on learning in the organization came when teachers were committed to carrying out their group dynamics [51].

The leadership values involved in the cooperation culture among the colleagues can be influenced by sharing the expertise in teaching [52]. It can be done formally in the classroom or informally interacting with fellow teachers during their free time [53]. The activities that can be carried out, such as establishing professional learning, guidance from colleagues, as well as cooperation and support from a more extensive and comprehensive learning community. This leadership value, which fosters a cooperative culture, is essential to support new teachers in improving their teaching and learning strategies.

#### 2.5. Connecting to the Community (JK)

Connecting to the community in this study refers to the teachers' accountability when working with their colleagues. Teachers must establish an honest and persistent relationship with the parents, community, and other stakeholders to improve the education system and expand students' learning (SGM). This dimension is in line with one of the domains in *Teacher Leader Model Standards* [54]: to improve the relationship and cooperation with the families and communities. Teacher

leaders demanded to understand the student's family condition, society, and the culture around them. This understanding will significantly impact the students' learning environment and indirectly improve educational processes. At the same time, teachers must realize that they need to have accountability towards the students, parents, colleagues, community, and as well as to the nation.

#### 2.6. Being a Consultant (PR)

Being a consultant is referred to the teacher's prominent role, which is to guide the students to achieve an excellent achievement either in academics or curricular activities. Teachers also demanded to lead the students and colleagues in achieving their goals without any instruction or coercion. The high-value in teacher's integrity can produce leaders capable of leading the process of change in education based on each other's religions and beliefs [55],[56]. In conclusion, teachers with higher integrity values can become leaders who could be referred by the students, colleagues, parents, and community. Thus, this dimension provides opportunities for experienced teachers to share their expertise with the new teachers [57] to improve teaching quality.

### 3. Methods

#### 3.1. Design

This study is a quantitative research that used a descriptive survey design. Confirmatory factor analysis (CFA) performed on the 31 items version of the teacher leadership model measuring the value aspects. Confirmatory factor analysis is a multivariate statistical technique used mostly in social science research [58]. This approach is frequently used to test the construct validity and dimensionality of the development scale or instruments. Thus, it is appropriate to test the number of factors or the latent constructs that will best fit the model examined.

#### 3.2. Participants

The respondents consist of 320 teachers selected randomly from 19 secondary schools around Kuala Lumpur, Malaysia. A total of 239 (74.7%) female teachers and 81 (25.3%) male teachers have participated in this study. As a sample is more significant than 200, it meets the rule of thumb mentioned by Hair et al. [58], [59] to decrease the likelihood of problems on the model's degree of freedom.

#### 3.3. Instrumentation

In this study, the researcher used a set of a

questionnaire containing 31 items (questions). The construct of Leading Teaching and Learning Process (PPdP) consisted of six items, Being A Follower (MI) with five items, Involving Actively in The Organization (KAdO) with four items, and Fostering Cultural Cooperation (MBK) with six items, Connecting to The Community (JK) with six items and Being A Consultant (PR) consisted of four items. All the research instruments were adapted from the Teacher Leadership Instrument built by the Universiti Pendidikan Sultan Idris (UPSI) researchers under Niche-Research Grant Scheme (NRGS) 2014. The content validity, which was done by the experts in leadership, had a score between 0.72 and 0.92. It was acceptable, according to Tuckman and Waheed [60].

### 3.4. Data Analysis

#### 3.4.1. Exploratory Factor Analysis (EFA)

The EFA was conducted on all six sub-constructs containing 31 items. Table 1 showed the initial constructs and items before the EFA conducted. A total of 100 questionnaire instruments were administered to teachers currently pursuing a Master of Education Management course at Sultan Idris Education University. EFA analysis was performed using the 'principal component analysis' (PCA) method. It is conducted to identify the underlying factors in the instruments [61]. Based on this method, items with a low value of less than or equal to 0.5 are dropped [58], [59].

**Table 1.** The initial constructs and items before EFA conducted.

Code	Constructs	Item
NIL1		Adhere to a comprehensive philosophy of national education
NIL2		exhibit a variety of leadership values and behaviors
NIL3	Leading Teaching and Learning Process (PPdP)	learn from their own experience
NIL4		have a high commitment to fulfil students need
NIL5		adopt a culture of cooperation to maximize student performance
NIL6		exhibit sensitivity to the diversity that exists in the classroom
NIL7		honest and humble in the effort to build positive interactions with fellow teachers and students
NIL8	Being A Follower (MI)	adopt a culture of creativity and innovation
NIL9		able to apply ethics/integrity in leadership practices
NIL10		have a high commitment to meet students need
NIL11		creative in fostering good decision-making skills among friends and students
NIL12		willing to take risks to achieve educational goals
NIL13	Involving Actively in The Organization (KAdO)	ready to face challenges to achieve educational goals
NIL14		have the value of lifelong learning
NIL15		successfully encourages students and colleagues to achieve excellence
NIL16		able to cultivate teamwork spirit to achieve the targeted goals
NIL17		share knowledge and ideas for best practices
NIL18	Fostering Cultural Cooperation (MBK)	always encourage colleagues to get involved in school development programs
NIL19		access and use research data to improve management practices
NIL20		practice self-reflection
NIL21		try to find opportunities
NIL22		take opportunities to achieve a vision
NIL23	Connecting to The Community (JK)	have the initiative to work with parents and the community
NIL24		sensitive to current educational developments
NIL25		have a high level of confidence to implement programs with parents and the community
NIL26		sensitive to the community context and culture
NIL27		acceptance of teacher perineurium to seize the opportunities available
NIL28	Being A Consultant (PR)	have ethical standards to follow
NIL29		strive continuously in developing creative and innovative values
NIL30		constantly enhancing his leadership values
NIL31		have high confidence in instructional and management

### 3.4.2. Confirmatory Factor Analysis (CFA)

To investigate the maximum likelihood confirmatory factor analysis of 29 items of Teacher Leadership Value Model Instrument after EFA, an AMOS software (version 20.0) was used to test the data's model fit. A data imputation was conducted on all the missing values cases, as suggested by Hair, et al. [58], [59]. The data normality was tested to eliminate any univariate outliers. A Mahalanobis distance is executed to delete the outliers from the data. Next, the Confirmatory Factor Analysis (CFA) was performed to estimate each variable's factor loading. All the latent variables have at least three indicators (questionnaire items). The loading factor achieved was greater than 0.5, which resulted from the factor loading analysis. According to Hair et al. [58], if the loading factor is equal to or greater than 0.7, it is considered a good indicator.

After the CFA procedure, the calculation of Convergent validity and discriminant validity tests the reliability and validity of the model. The convergent validity determines how far the items reflected the latent theoretical construct measured by the items. The discriminant validity measures how far the items will distinct from each other [58], [59]. A discriminant validity test was conducted to test each variable's significant variance for the same purpose. If the correlation between the two latent variables exceeds 0.9, it shows an overlap between these constructs [58]. Discriminant validity was tested by comparing the square root of the AVE and the correlation between the constructs. The discriminant validity of the constructs is achieved if the AVE's square root is higher than the correlation between the constructs [62].

## 4. The Findings

### 4.1. Exploratory Factor Analysis

The EFA results on the Teacher Leadership Values instrument show that the Kaiser-Meyer-Olkin (KMO) sample adequacy test at 0.91 and Bartlett's Test of Sphericity with a chi-square value of 2712.443 at 465 degrees of independence are significant,  $p < 0.05$ . It proved that the number of samples used in EFA was

sufficient [58]. Table 2 showed the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity score for this model.

**Table 2.** The KMO and Bartlett's Test Score

Kaiser-Meyer-Olkin (KMO)	Measure of Sampling Adequacy	.906
Bartlett's Test of Sphericity	Approx. Chi-Square Sphericity	2712.443
	Df	465
	Sig.	.000

The uniformity values of the items range from .436 to .790. To determine the underlying factors in the instruments, the orthogonal rotation with the varimax method was performed. The orthogonal rotation is selected to ensure that the observed variables are not correlated with each other. The varimax rotation was selected to determine the factors loaded at its maximum rotation. According to Hair et al. [57], [59] any decisions on the number of factors to be retained should be based on several considerations which are, factors with eigenvalues greater than 1.0; a predetermined number of factors based on research objectives and prior research; enough factors to meet a specified percentage of variance explained, usually 60% or higher; or a scree test plot. Table 2 showed that only three factors to explain the total variance in the instruments where the Eigenvalue is greater than 1. Therefore, there are only three dimensions emerged from the EFA procedures. The eigenvalues in Table 3 ranged between 1.392 and 16.85. The primary purpose is to maximize high factor load variance and reduce low load value [63]. From the analysis, the variance explained for component one is 54.35%, component two is 5.513%, and component three is 4.491%. The total variance explained for measuring these three constructs is 64.362%. The total variance explained is acceptable since it exceeded the minimum requirement of 60% [58].

Table 4 showed the three dimensions that emerged and their respective items resulted from the EFA procedure. The factor loading of more than 0.5 of every item was retained for the CFA analysis [58]. The item with lower than 0.5 loadings dropped, as suggested by Hair et al. [58]. Only two items, NIL 14 and NIL 20, dropped as the loading lower than 0.5.

**Table 3.** Total variances explained

Comp	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Var	Cum %	Total	% of Var	Cum %	Total	% of Var	Cum %
1	16.85	54.35	54.35	16.851	54.357	54.357	7.372	23.780	23.780
2	1.709	5.513	59.87	1.709	5.513	59.871	6.877	22.217	45.997
3	1.392	4.491	64.36	1.392	4.491	64.362	5.693	18.365	64.362

**Table 4.** The Exploratory Factor Analysis (EFA) components and their respective items

<b>Rotated Component Matrix</b>			
	Component		
	1	2	3
NIL 22.	.726		
NIL 23	.608		
NIL 24	.636		
NIL 25	.624		
NIL 26	.586		
NIL 27	.602		
NIL 28	.578		
NIL 29	.746		
NIL 30	.735		
NIL 31	.634		
NIL 12		.685	
NIL 13		.803	
NIL 15		.555	
NIL 16		.580	
NIL 17		.630	
NIL 18		.609	
NIL 19		.646	
NIL 21		.618	
NIL 1			.682
NIL 2			.654
NIL 3			.664
NIL 4			.764
NIL 5			.692
NIL 6			.652
NIL 7			.569
NIL 8			.622
NIL 9			.559
NIL 10			.559
NIL 11			.797
Extraction Method: Principal Component Analysis.			
Rotation Method: Varimax with Kaiser Normalization			
Rotation converged in 7 iterations			

**Table 5.** The Internal Reliability of the constructs

Reliability Statistics		
Component	Number of Items	Cronbach's Alpha
Component one	10	.931
Component two	8	.928
Component three	11	.913
All items	29	0.969

Next, the Cronbach's Alpha for each of the latent construct needs to be calculated as it will reflect the Internal Reliability of the items in measuring the construct. It showed how strong the items in holding together to measure their constructs. Cronbach's Alpha's value needs to be more than 0.7 for the items achieving its Internal Reliability [58], [59]. Table 5 showed the result for the Cronbach's Alpha for each component. All the items are reliable since their Cronbach's Alpha is more than 0.7.

From the EFA analysis, only three dimensions emerged compared to six dimensions purposed earlier in the literature review. This instruments then regroup into a new group which are being a consultant (component one), fostering a cooperation culture (component two) and leading the teaching and learning process (component three). Details of these regrouping are stated in Table 6.

#### 4.2. The Confirmatory Factor Analysis

The Confirmatory Factor Analysis (CFA) was executed on the Teacher Leadership Value Model after the EFA procedure. The instrument only consisted of three latent constructs compared to six constructs that were proposed earlier. The construct that developed is Being a Consultant (PR), Fostering a Cooperation Culture (MBK), and Leading the Teaching and Learning Process (PPdP).

**Table 6.** The new constructs and its respective items based on EFA result.

Item Code		Initial Construct	New Construct
NIL 22.	take opportunities to achieve a vision	JK	
NIL 23	have the initiative to work with parents and the community	JK	
NIL 24	sensitive to current educational developments	JK	
NIL 25	have a high level of confidence to implement programs with parents and the community	JK	
NIL 26	sensitive to the community context and culture	JK	Being a Consultant (PR)
NIL 27	acceptance of teacher perineurium to seize the opportunities available	JK	
NIL 28	have ethical standards to follow	PR	
NIL 29	strive continuously in developing creative and innovative values	PR	
NIL 30	constantly enhancing his leadership values	PR	
NIL 31	have high confidence in instructional and management	PR	
NIL 12	willing to take risks to achieve educational goals	KAdO	
NIL 13	ready to face challenges to achieve educational goals	KAdO	
NIL 15	successfully encourages students and colleagues to achieve excellence	KAdO	
NIL 16	able to cultivate teamwork spirit to achieve the targeted goals	MBK	Fostering a cooperation culture (MBK)
NIL 17	share knowledge and ideas for best practices	MBK	
NIL 18	always encourage colleagues to get involved in school development programs	MBK	
NIL 19	access and use research data to improve management practices	MBK	
NIL 21	try to find opportunities	MBK	
NIL 1	Adhere to a comprehensive philosophy of national education	PPdP	
NIL 2	exhibit a variety of leadership values and behaviors	PPdP	
NIL 3	learn from their own experience	PPdP	
NIL 4	have a high commitment to fulfil students need	PPdP	
NIL 5	adopt a culture of cooperation to maximize student performance	PPdP	
NIL 6	exhibit sensitivity to the diversity that exists in the classroom	PPdP	Teaching and Learning Process (PPdP)
NIL 7	honest and humble in the effort to build positive interactions with fellow teachers and students	MI	
NIL 8	adopt a culture of creativity and innovation	MI	
NIL 9	able to apply ethics / integrity in leadership practices	MI	
NIL 10	have a high commitment to meet students need	MI	
NIL 11	creative in fostering good decision-making skills among friends and students	MI	



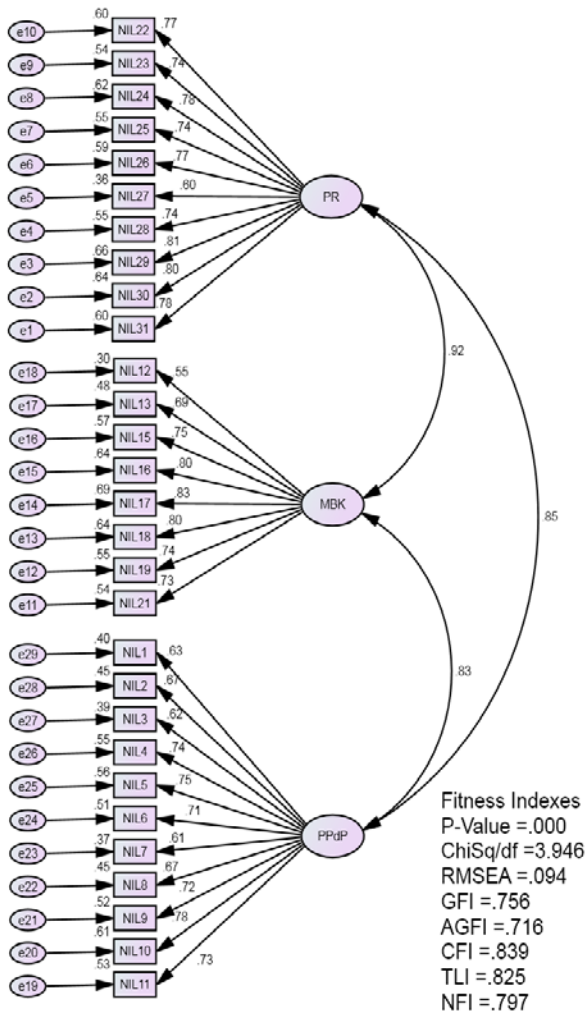
4.2.1. The Goodness of Fit Indexes

The maximum likelihood Confirmatory Factor Analysis (CFA) was used to assess the underlying latent variable structure existed in the Teacher Leadership Value Model Instrument. Standardized loading estimates on each factor must distinguish between .5 and ideally .7 or higher [58]. A higher loading means that the items are strongly related to their constructs. Lower estimates values will be suggested that the items should be dropped. For this model to achieve the acceptable fit, the following indexes are required: CMIN/DF <5.0, Comparative fit index (CFI) ≥ 0.90, adjusted goodness-of-fit index (AGFI) ≥ 0.90, root mean square error of approximation (RMSEA) ≥ 0.90, Tucker-Lewis Index (TLI) ≥ 0.90 and standardized root mean square residual (SRMR) ≤ 0.06 [64] [65] [66]. This measurement model of teacher leadership value was accepted if the teacher leadership value model has met at least one of the goodness of fit indices from each category of the goodness of fit model [58].

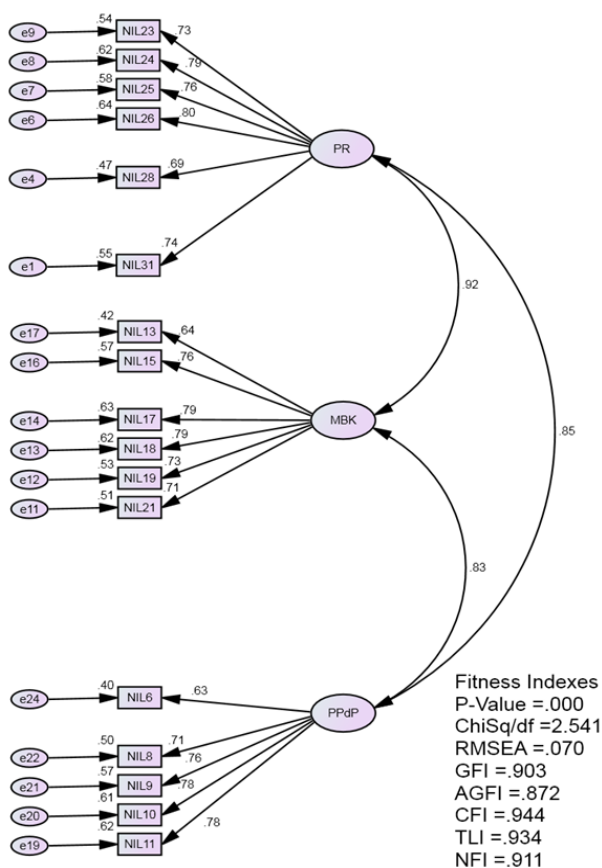
Figure 1 showed the result of Confirmatory Factor Analysis on the Teacher Leadership Value Instrument. The analyzed data showed that it did not fit the specified factorial structure. The chi-square value, CMIN/DF is 3.946 (achieved the threshold of 5.0), RMSEA is 0.094 (achieved the threshold of ≥ 0.90), GFI is 0.756 (not achieved the threshold of ≥ 0.90), AGFI is 0.716 (is not achieved the threshold of ≥ 0.90), CFI is 0.839 (is not achieved the threshold of ≥ 0.90) and TLI is 0.825 (is not achieved the threshold of ≥ 0.90). Examination on the modification indices showed that items with higher error terms need to be deleted to achieve the model fit indices requirement.

In the construct of Being a Consultant (PR), three items were deleted. NIL 27 (teachers need to have entrepreneurial value to seize the opportunities), NIL 29 (teachers need to work continuously in developing creative and innovative values), and NIL 30 (teachers always strive to increase the value of their leadership) dropped. In the construct of the fostering cooperation culture (MBK), two items were deleted. NIL 12 (teachers are willing to take risks to achieve the educational goals) and NIL 16 (teachers can cultivate teamwork spirit to achieve the targeted goals) dropped.

Meanwhile, six items were deleted in the third construct of leading the teaching and learning process (PPdP). NIL 1 (teachers need to adhere to a comprehensive educational philosophy), NIL 2 (teachers need to demonstrate a variety of leadership values and behaviors), NIL 3 (teachers can learn from their own experience), NIL 4 (teachers committed to meet the student’s needs), NIL 5 (teachers practice collaboration among them to maximize their student performance), and NIL 7 (teachers should be honest and humble in their efforts to build positive interactions with peers and students) dropped. After all the items deleted, the Teacher Leadership Value Instrument achieved a good fit, with Chisq/df of 2.368 (achieved the threshold of 5.0), RMSEA is 0.064 (achieved the threshold of ≥ 0.90), GFI is 0.912 (achieved the threshold of ≥ 0.90), AGFI is 0.884 (is not achieved the threshold of ≥ 0.90), CFI is 0.955 (achieved the threshold of ≥ 0.90), TLI is 0.947 (achieved the threshold of ≥ 0.90) and NFI is 0.924 (achieved the threshold of ≥ 0.90). According to Hair et al. [58], [59], they must achieve at least one absolute fit index and one incremental fit index as an addition to the  $\chi^2$  statistics result. In the Absolute Fit category, the RMSEA and GFI meet the required threshold. In the Incremental Fit category, the NFI, CFI, and TLI meet the requirement for model fit. Next, in the Parsimonious fit category, the chisq/df achieved the required threshold given. Therefore, the measurement of all the latent constructs in Figure 2 fulfilled the requirement for construct validity [58], [59]. All the fitness indexes for this model showed in Table 4.



**Figure 1.** The initial CFA of Teacher Leadership Value Model: Being a Consultant (PR), Fostering Cooperation Culture (MBK) and Leading the teaching and learning process (PPdP).



**Figure 2.** The Teacher Leadership Value Model: Being a consultant (PR), Fostering cooperation culture (MBK), and Leading the teaching and learning process (PPdP).

**Table 7.** The results of CFA First Order on Teacher Leadership Value Instrument

No	Category	Types of Fitness Index	Index Value
1	Absolute fit	RMSEA	.070
		GFI	.903
2.	Incremental fit	CFI	.944
		TLI	.934
		NFI	.911
3	Parsimonious fit	Chisq/df	2.541

4.2.2. The Validity and Reliability of the Teacher Leadership Value Construct

To determine the Convergent Validity of this instrument, the computation of the Average Variance Extracted (AVE) needs to be executed first. This instrument will achieve convergent validity if its AVE greater than the threshold value at 0.5 [67]. Then, the composite reliability determined by computation of Construct reliability (CR) values, and its value must not exceed 0.7 for the reliability [58] [59]. Based on Table 5, the Composite Reliability value for CFA also met the prescribed value of  $\geq 0.6$ . Whereas, the Composite Reliability value sub-constructs of being a consultant (PR), fostering a cooperation culture

(MBK), and leading the teaching and learning process (PPdP) are 0.88, 0.88, and 0.85. For the Average Variance Extracted (AVE) value, the sub-construct of being a consultant recorded (PR) 0.57, fostering a cooperation culture (MBK) is 0.55 while leading the teaching and learning process (PPdP) is 0.54. All the values obtained have met the prescribed criteria where the AVE value is  $\geq 0.5$ .

**Table 8.** The results of the CFA Teacher Leadership Value Measurement Model

Construct	Item	Factor Loading	CR $\geq$ 0.70	AVE $\geq$ 0.50
PR	NIL 23	.73	.89	.57
	NIL 24	.79		
	NIL 25	.76		
	NIL 26	.80		
	NIL 28	.69		
	NIL 31	.74		
MBK	NIL 13	.64	.88	.55
	NIL 15	.76		
	NIL 17	.79		
	NIL 18	.79		
	NIL 19	.73		
	NIL 21	.71		
PPdP	NIL 6	.63	.85	.54
	NIL 8	.71		
	NIL 9	.76		
	NIL 10	.78		
	NIL 11	.78		

5. Discussion

The result of this study showed that the existing proposed instrument with six constructs, which are Leading Teaching and Learning Process, Being A Follower, Involving Actively in the Organisation, Fostering Cultural Cooperation, connecting to the Community and Being A Consultant are not fit to the model. After the Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) performed, only three constructs were fit in the model which are Being a consultant (PR), Fostering cooperation culture (MBK), and Leading the teaching and learning process (PPdP). All the proposed 31 items were reduced to only 17 items in improving the model fit and parsimony.

This study confirmed that teachers being a consultant is one of the important values in teacher leadership skills. It is a value that allowed the teachers to work closely with parents, community and be sensitive towards the latest educational development. It also encouraged them to increase their confidence level and be sensitive to the community's culture and context. It will guide them in their

everyday lives and make them believe in the instructional and management. The teacher leaders who are competent and committed can carry out entrusted responsibilities [68]. Teachers also can easily collaborate and often become references to other teachers and parents. These findings were supported by a study conducted by [69], which stated that the teachers who have the expertise and ability could influence others. Teachers who have the qualities of a leader will be able to carry out their duties as advisors and mentors to help their colleagues and bring positive changes to the school atmosphere [55]. The committed teachers always contribute more than expected as they believe that it will set an example for their students and the school community. They are aware that their responsibility influences the students and their colleagues to achieve the desired goals in line with the school's vision and mission.

A study by Suriansyah and Aslamiah [70] stated that teachers who showed an excellent manner to their students, respect the students, dress appropriately, punctual, and always care about cleanliness in the classroom can be an excellent example to the students. Their study also proved that active teacher participation in teaching and learning would help develop students' characters. It includes their daily communication, encourages them to engage actively in the classroom and seeks changes and emotional development in everyday activities. A study of Lowery-Moore, Latimer and Villate [71] supports this research; they mentioned that teacher leadership would make teachers better understand their relationship to the schools and community. Teachers will also feel more comfortable finding answers to new questions as they help their schools and community move forward. Therefore, this study's finding confirmed that this construct is one of the most critical constructs in teacher leadership in terms of values.

The second construct developed in this model is fostering a cooperation Culture (MBK) construct. This construct measured teachers' value in terms of their willingness to face the challenges; encouraging colleagues and students to excel; sharing knowledge and ideas for best practices; encouraging colleagues to be involved in school improvement programs; using research to improve management practices, and being able to seek new opportunities. Cooperation culture or collaboration culture also refers to teacher commitment to perform and carry out the task, trust, and responsibility. Each task must be done collectively, according to Dahlgren and Chirac's [48] study. This study was supported by a study of Prugsamatz [51], where he proved that the group's work has a strong influence on organizational learning. Another study by Ciampa and Gallagher [72] stated that teacher collaboration changed the teacher's instructional and assessment practices and self-efficacy. The collaboration with other teachers in sharing knowledge and future planning will encourage them to take more risks, creativity, develop their intrinsic motivation, and increase their

professional satisfaction. A study by Wan and Mohd. Sabri [73] also stated that collaboration is a continuous learning process and as a medium of sharing pieces of knowledge among teachers. Through collaboration, the mission and vision in the school are easier to achieve. According to Pang and Miao [74], collaboration and teamwork are the priority in everyday management and teacher leaders' administration.

A teacher must not work alone to meet the student's and schools' needs in general. They should cooperate with others to obtain multiple sources [75]. This cooperation or collaboration is essential for teachers to achieve their common goals as they have their specialities [76] and provide more space for teachers to apply these skills, especially when dealing with pupils in the classroom [77]. Cultural cooperation also indirectly helps teachers to obtain additional information to develop their potential. The value of cooperation culture can avoid misunderstandings and dissatisfaction among the teachers [78]. A study by Mohd Faiz, Muhammad Rozaimie, and Jamal [79] stated that teachers collaborate at school through Professional Learning Community (PLC). In PLC, teachers are actively involved in communications with other teachers. They will be discussing their daily routines or problems inside the classroom with other teachers. Then, this discussion will lead to the development of teachers' pedagogical strategies and, thus, support each other in trying new methods inside the classroom. In other words, the value of fostering a collaborative culture is capable of forming a team that aims to ensure school success [55].

Teacher leaders are capable of fostering a teamwork culture with their peers. A study conducted by Berry, Daughtery and Wider [80] states that schools with an abundance of experience teachers and specialists in education will produce an outstanding achievement through working with their peers. The sharing session with new teachers will help their peers improve their teaching and learning methods in the classroom. This study was supported by Riveros, Newton, and Costa [81], who stated that teacher leadership would contribute to teacher professional development. A survey conducted by Pang and Miao [74] on teacher leadership practice in education reform in Shanghai revealed that Shanghai teachers play an essential role in collaborating and thus supporting school improvement. According to their research, teachers will help other teachers deal with education problems to ensure that educational excellence is shared.

A study conducted by Flores, Fernandes, Flores, and Forte [82] on teachers in Portugal found that collaboration between teachers is critical in their daily lives. Collaboration between fellow teachers is crucial in sharing ideas, materials, and also reflected on their teaching. According to a study conducted by the Rennie Center for Education Research & Policy [83], schools with higher collaboration levels are associated more with excellent student achievement. This study shows that teachers will

produce great students when they are at the school that promotes collaboration with colleagues. This collaboration allows them to discuss instructional issues, irrespective of their educational background, experience, or student achievement. Studies show that teachers are more comfortable discussing their instructional problems with their colleagues than with the principals or officials involved. This evidence shows that teacher collaboration is essential in driving school improvement, creating an environment for teachers to improve their teaching while helping students meet their diverse needs. Cosenza [84] found that teachers look at themselves as acting leaders when they collaborate. Through collaboration, they can make decisions that enhance their teaching and provide support for each other. According to them, this is the definition of teacher leadership they know. Besides, they also said that the sharing of best practice was through collaboration with each other. Teachers feel they are fully empowered when they share their teaching practice with their colleagues.

The third construct found in this study is leading the teaching and learning process (PPdP). Leading the teaching and learning process includes the value of sensitivity towards diversity in the classroom, practising a culture of creativity and innovation, applying ethics, and having a strong commitment and creativity in decision making. The study of Southworth [85] found that teacher leadership is closely related to teaching and learning, including teachers' professional learning and students' development. The teachers' duties and responsibilities as the leader of the teaching and learning process are not only focused on the students but also cover the entire school community. Nowadays, the roles of the teachers themselves have been very complex and challenging. Therefore, teachers should strive to improve their teaching professionalism so that the teaching profession's dignity will be respected continuously. Teachers will support one another in the efforts to enhance teaching and clinical engagement [86].

Rahayu's study [87] showed that the changing of teaching and learning methods in Chemistry subjects from traditional approaches to innovative ways resulted in improving student results. The student's achievement showed that 100% of the students scored 70 marks and above, the quality of learning also improves by more student's handover their assignments in time, their interaction and communication in using the English language as a medium increase, and their perspective towards the subjects change drastically. Most of them stated that they feel excited to learn the subject, which helps them understand the subject better. This study proved that the teacher's approach to delivering teaching and learning could be subject to students' achievement in the subject. The teachers are fully responsible for teaching and learning, not only in the classroom but also in the other areas of the school environment. Thus, effective teaching can lead to student achievement [88].

Davies and Brighouse [89] study mentioned that to create learning momentum in the classroom, build the capacity, ensure the environment, continue the vision, face and minimize the crisis, and search and chart the progress will help teachers to find direction in teaching and learning process. A study by Tan, Ooi and Teh [90] found that 60% of trainee teachers showed an improvement in their quiz questions when engaging in lesson study and gallery tour collaboration activities. This study is in line with Zetty, Siti Rashidah, Norshilawani, Ahmad Shafiq, Zanaton and Sri Andayani [91] the teaching of Islamic education through the lesson study culture. They found that teachers need to share their best practices in teaching. Every teacher has a wide range of skills; through the learning process, they can share their skills and expertise in solving problems encountered in the subject. This study will indirectly contribute to student understanding and thus enhance student achievement. Therefore, this study proved that all the three constructs developed in this instrument, which are Being a consultant (PR), Fostering cooperation culture (MBK), and Leading the teaching and learning process (PPdP), are crucial values in Teacher Leadership Value Model.

## 6. Conclusions

The results of this study allow various parties, particularly the Ministry of Education (MOE), to review the training and selection of prospective teachers to produce teachers with high leadership values. The results also can help the ministry to take appropriate steps to produce world-class teachers. This study is also essential to institutions such as educational institutions, both private and local, to train the teachers and prospective teachers to balance in terms of values, knowledge, and skills. The training provided can produce teacher leaders who have the leadership qualities described in the Malaysian Teachers Standard (*Standard Guru Malaysia*). School authorities should civilize teacher leadership values among the teachers and students in school. It can improve teachers' service quality, which can produce a balanced human capital in line with the National Philosophy of Education.

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