

The validity and reliability of culturally responsive leadership practice instruments in small schools peninsular Malaysia

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ABSTRACT

A culturally responsive leadership instrument was developed to determine the level of culturally responsive leadership practice of headmasters in small schools in Peninsular Malaysia. This study was conducted in Perak and Negeri Sembilan to determine the instrument's reliability and validity. Exploratory factor analysis (EFA) and item reliability analysis were used to determine the questionnaire's reliability and validity. Next, the average congruence percentage (ACP) is used to determine the reliability test between expert assessors. Experts approved the validity and reliability of the instrument before the EFA test was conducted. All four constructs have high-reliability index values between 0.88–0.93. Next, the EFA analysis shows four dimensions in the culturally responsive leadership instrument with factor loadings ranging from 0.62–0.88. The findings also show that the variance explained in the data is 65.16% with an eigenvalue greater than 1. This result showed that all items are received with high approval. In addition, the reliability coefficient $\alpha=0.93$ is very high. The results prove that this culturally responsive leadership instrument has high validity and reliability and can measure the level of culturally responsive leadership implementation practices in small schools in Peninsular Malaysia.

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1. INTRODUCTION

In Malaysia, there are schools with a small number of students whose number is categorized as small schools, whose number according to the Ministry of Education Malaysia, as 150 and below [1]. Small schools contribute 30.75 % of all schools in Malaysia [2]. A total of 73% of the locations of small schools in Malaysia are in rural areas. While the academic achievement in this small school is lower compared to other schools, the average achievement score of the small school is 68%. This score is lower by 4% than other schools [1]. Among the factors mentioned is the difficulty of finding and retaining teachers and placing quality headmasters to serve in the school.

Previous studies have found that the low academic achievement of rural students is due to a number of factors, including socioeconomic and student background, school location and student placement, teacher teaching style, and student learning, with school leadership being the most important factor [3]. Several problems and constraints in small schools also contribute to the achievement of performance in small schools. Among the issues faced by small schools are school infrastructure, high teacher turnover, the location of the school, and the diversity of students in the implementation of combined classes, all of which require a high level

of preparedness on the part of school administrators [4]. One of the factors of low performance in small schools compared to other schools is the efficacy of leadership [1].

The leadership patterns of school administrators impact school organizations toward positive change and improve the quality of student achievement [5]. According to Jalilah [6], school leaders should adopt a leadership style that is in line with the situation in school because school leaders always deal with people who have feelings, namely students, teachers, and school staff. Nowadays, various racial issues occur in schools in this country. This is because Malaysia is a country with racial diversity, and sensitivity needs to be prioritized. Therefore, schools need leadership that is able to deal with these situations.

Most school leaders are less and less practicing culturally responsive leadership practices that highlight strategic components, professional development opportunities, and the background to establish a school environment that incorporates all students [7]. In relation to that, an appropriate leadership style can influence the behavior and attitude of school members to cooperate and unite in a diverse environment for the sake of school organizational excellence. A study conducted by Leithwood [8], found that to be a successful school leader, it is necessary to have the quality and ability to build relationships that help make the school a great organization by accepting racial, ethnic, cultural, linguistic, and socioeconomic diversity, which is characteristic of the school 21st century. Therefore, this study focuses on the level of culturally responsive leadership practices practiced by headmasters in small schools. However, to what extent is the leadership style practiced in small schools? To ensure the practice of headmasters in culturally responsive leadership, then a need to measure the level of that leadership style through an instrument that will be developed based on the culturally responsive leadership framework developed by Khalifa [9] with four constructs in this leadership style.

Context in Malaysia, culturally responsive leadership items were created for this study. To ensure that each item was precise and had high validity and reliability values, numerous instrument development processes were carried out prior to the creation of this test. This study aims to verify the validity and reliability of the culturally responsive leadership instrument so that researchers or other education stakeholders can use it to evaluate the leadership style of school administrators in Malaysia.

2. RESEARCH METHOD

2.1. Sample and data collection

This study was designed and conducted in two states in Peninsular Malaysia, namely Perak and Negeri Sembilan. The research design is a survey study using a questionnaire administered using Google Form application. After evaluating and selecting respondents for this survey, the researcher emailed them a link to a Google Form to answer. A total of 150 respondents were sent a link via email and WhatsApp involving 73 small schools in Perak and Negeri Sembilan and only 102 questionnaires were answered correctly and then analyzed this number is considered sufficient based on Maccallum *et al.* [10]. The number of respondents conducting this exploratory factor analysis (EFA) is a minimum of 60 respondents and according to Hair *et al.* [11] study involving EFA based on a suitable sample size of 100 people.

2.2. Instrumentation

The culturally responsive leadership framework was used in the development of this research questionnaire [9]. Four constructs in the framework will be used to measure the culturally responsive leadership level of headmasters at small schools. Shaping culturally sensitive teachers, critical self-reflection, parent and community involvement, and inclusive school environments are the constructs. The development of this questionnaire is also through the process of analyzing leadership theories, among which are the Trait leadership theory by Stodgill [12], the social justice theory of Rawls [13], the transformational leadership theory of Bass [14], and Burns [15]. The semi-structured interview process conducted by the researcher is to obtain more accurate additional information from those responsible for small schools and respondents who will be studied as a process in building questionnaire items. The interview involved officials from the Departments of the Malaysia Ministry of Education, such as the teacher professionalism division, the educational planning and research division, the inspectorate, headmasters, and teachers from small schools.

Next, to ensure the validity of the questionnaire, the researcher used the method of face validity and content validity, referring to 10 experts to evaluate the questionnaire items. To determine the reliability between experts average congruency percentage (ACP) is used [16]. Meanwhile, Waltz suggested that the ACP value should reach 90% or above [17]. After receiving feedback from the experts, there is one item that does not reach the level that has been set. The researcher has dropped the items, and subsequently to ensure the reliability of the questionnaire, the researcher will conduct a pilot study.

After the pilot is carried out, the data will be analyzed to see the item's validity and reliability level through EFA and Cronbach's alpha. The final construct to perform EFA consists of four components, with 40 items. The scale used in this study is (1 for strongly disagree to 5 for strongly agree). Using a five-interval

scale is used to raise the response rate and response quality while decreasing respondents' "frustration level" [18], increasing the response rate and response quality more effectively [19].

2.3. Exploratory factor analysis

After the EFA is carried out, the items that have been received will be grouped according to the constructs that have been set. The next process is to determine the reliability of each construct formed in this instrument due to the EFA produced. This reliability value determines the extent to which this instrument can be used in real studies of real studies [20]. If a high-reliability value is obtained on the instrument, it helps to obtain more accurate data in line with the objective requirements of the study [21].

3. RESULTS

The original item construct had 41 items from all four culturally responsive leadership constructs. After expert evaluation, 1 item was dropped, and only 40 items were made for the entire construct. The results of the EFA and reliability analysis, which included all of the items, are discussed in the subsection.

3.1. Exploratory factor analysis for validity

There are 40 items in culturally responsive leadership that have been analyzed using EFA with a varimax rotation solution. However, the factor loading for some items are not under the factor from the EFA that has been done. In addition, there are also items with a factor loading value of less than 0.60. This is in line with the recommendation by Hair *et al.* [11], these items that are less than the recommended value have been eliminated. Tables 1 to 3 shows the results of the EFA conducted for the construct validity of the instrument tested. The variance values for each factor, eigenvalues, Kaiser-Meyer Olkin (KMO) values, and Bartlett's Test of Sphericity values will be explained in detail.

Based on the KMO and Bartlett's Tests are used to determine the appropriateness of items for factor analysis [22]. The KMO test is used to determine whether the study sample is suitable for conducting factor analysis. Factor analysis in statistics is about identifying factors or underlying causes that can be used in the relationship between two or more variables. In order to determine the multicollinearity of the items in this instrument, the KMO test was also conducted. Multicollinearity is a value that determines whether there exists between two or more items to measure the same thing.

In contrast, Bartlett's Test of Sphericity identifies whether there is a correlation between items or a statistical test to see the correlation between variables that gives the statistical probability that the correlation matrix has a significant correlation between at least some variables. Based on Table 1, the appropriateness test of the use of factor analysis and uniformity of items for the culturally responsive leadership construct was found to be suitable because the KMO value that measures the adequacy of the sample showed a value of 0.86, which is above the minimum recommended value of 0.60 [23]. According to previous studies [11], [24], a KMO value in the range of 0.80 is considered proud. The value of Bartlett's Test of Sphericity is significant ($p < 0.05$), which supports the factorization of the correlation matrix and provides evidence that the variables are independent and suitable for factor analysis [25].

Table 1. Appropriateness test using factor analysis and uniformity of KMO items and Bartlett's Test of culturally responsive leadership construct

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin measure of sampling adequacy		0.860
Bartlett's Test of Sphericity	Approx. Chi-square	3610.247
	Df	780
	Sig.	0.000

Next, the value of the explained variance (total variance explained) is the percentage of items that are important to the researcher to be used to measure the study variables. The results of the analysis of the culturally responsive leadership construct show that the items with the variance contribution weighting value of each factor are shown in Table 2. The amount of explained variance' to measure this culturally responsive leadership construct is 65.16% which is adequate and acceptable because it exceeds the 50% minimum set [24], [26]. The four factors explain as much as 65.16% of the total variance in the construct. While the variance value is 32.88%, which is less than 50% showing that the data does not occur with common method bias [27]. The results found four main factors extracted in the culturally responsive leadership construct and correspond to the results in Table 2.

Table 2. Total variants (n=102) for culturally responsive leadership instrument

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	13.152	32.881	32.881	13.152	32.881	32.881
2	8.395	20.986	53.867	8.395	20.986	53.867
3	2.506	6.264	60.132	2.506	6.264	60.132
4	2.013	5.032	65.164	2.013	5.032	65.164

A component matrix with varimax rotation (rotated component matrix) is conducted to show the correlation between the items and their factors after varimax rotation. All items from the four constructs of culturally responsive leadership were analyzed. Table 3 shows the weighting value of the rotated factor analysis for the culturally responsive leadership construct. A total of 40 items were constructed for the culturally responsive leadership construct; after the factor analysis was tested, of the total, only 33 items met the conditions for the culturally responsive leadership construct. On the other hand, as many as seven items had to be dropped because they did not meet the conditions of having a factor weighting value of less than 0.60.

Table 3. Items of the culturally responsive leadership instrument after EFA: factor loading (FL) based on principal axis factoring and varimax (FL<0.60 removed)

No. item	No. item		FL components			
			1	2	3	4
1	B1	Critical self-reflection	0.857			
2	B2		0.841			
3	B3		0.824			
4	B4		0.822			
5	B5		0.790			
6	B6		0.709			
7	B7		0.669			
8	B8		0.668			
9	B9		0.632			
10	B10	Forming culturally sensitive teachers		0.879		
11	B11			0.868		
12	B12			0.813		
13	B13			0.804		
14	B14			0.790		
15	B15			0.732		
16	B16			0.654		
17	B17			0.720		
18	B18	Inclusive school environment			0.791	
19	B19				0.786	
20	B20				0.743	
21	B21				0.732	
22	B22				0.713	
23	B23				0.706	
24	B24				0.652	
25	B25				0.698	
26	B26	Parent and community involvement				0.754
27	B27					0.719
28	B28					0.702
29	B29					0.684
30	B30					0.632
31	B31					0.728
32	B32					0.661
33	B33					0.616

Refer a rotated factor weighting analysis of the culturally responsive leadership construct represented by the forming culturally sensitive teachers subconstruct, critical self-reflection, parent and community involvement, and inclusive school environment. Factor analysis of the sub-construct of self-reflection critically shows that nine accepted items are out of 10 constructed items from B1 to B9, with factor weighting values ranging from 0.632 to 0.857. Factor analysis for the sub-construct of forming a culturally sensitive teacher shows eight accepted items out of 10 constructed items from B10 to B17, with factor weighting values ranging from 0.654 to 0.879. While the factor analysis for the inclusive school environment sub-construct shows that only eight items are accepted out of 10 constructed items from B18 to B25, with factor weighting values ranging from 0.652 to 0.791. Factor analysis for the parent and community

involvement sub-construct shows that there are eight accepted items out of 10 constructed items which are B26 to B33 with factor weighting values ranging from 0.616 to 0.754.

3.2. Item analysis for reliability

The data obtained from the findings of the study were analyzed using IBM SPSS Statistic version 26 with the internal consistency method (internal consistency approach). The method is often used in measuring the reliability of a questionnaire instrument is the calculation of the reliability coefficient index (Cronbach's alpha). According to Gay, Mills, and Airasian [28], reliability refers to the concept of consistency and stability of an instrument. Consistency means that the same item has been tested repeatedly at different times and on the same subject, but the result score or answer given is still the same, while stability is freedom from error and able to produce consistent results [29].

Next, Cronbach's alpha coefficient index test was conducted to determine the reliability of this research instrument, and the sufficient and adequate alpha value of the index is between 0.00 and 1.00 [28]. While for Hair *et al.* [11], an alpha value between 0.7 and 0.8 is acceptable, and a lower alpha value means the reliability of the instrument is also lower. An alpha coefficient value of around .90 is considered "excellent", around .80 is "very good" and a value of around 0.50 to 0.79 is adequate. While values less than 0.50, it is considered unacceptable [29]. Cronbach's alpha classification is as in Table 4.

Table 4. Cronbach's alpha reliability index for culturally responsive leadership construct

	No. of items	Cronbach's alpha value
Critical self-reflection	9	0.932
Forming culturally sensitive teachers	8	0.928
Inclusive school environment	8	0.926
Parent and community involvement	8	0.878
Total	33	0.933

Table 4 shows Cronbach's alpha value coefficient index for the culturally responsive leadership constructs. Cronbach's alpha value coefficient index analysis for the element of critical self-reflection is 0.932, forming culturally sensitive teachers is 0.928, the inclusive school environment is 0.926, and for parental involvement and community analysis, Cronbach's alpha value index is 0.878. Overall, Cronbach's alpha value (α) for the whole instrument of culturally responsive leadership was 0.933. Thus, this shows that the items in the construct of culturally responsive leadership have high and consistent reliability values.

4. DISCUSSION

Malaysia is a country with racial diversity, and this diversity has an influence on the school environment. The practice of leadership in schools is a determinant of the success of an excellent school direction, but nowadays there are various challenges in the aspect of leadership in schools both outside and within the school organization [30]. In the context of leadership, there are fewer and fewer school leaders practicing leadership practices that emphasize the aspect of developing a school environment that involves all students regardless of background [7]. In addition, in when compared to other schools, small schools have slightly different management and leadership responsibilities for teachers and school leaders [31]. Culturally responsive leadership is one of the best approaches to ensure leadership practices that accept and recognize the culture of students, families, and society [7]. Based on the statement, there is a need to develop an instrument that will be used to measure the level of culturally responsive leadership practices in small schools.

Therefore, the culturally responsive leadership instrument developed based on the culturally responsive leadership framework of Khalifa, Gooden and Davis was adapted to be used for small schools in Malaysia, and factor analysis was first conducted on the instrument to ensure the validity and reliability of the instrument to be used [9]. High reliability and validity values show the high quality of the study instrument. Value on the score reliability explains that the instrument used is consistent and stable [20]. Consistency on the instrument is when the researcher receives almost the same score after conducting the test repeatedly and at different times [32]. Factor analysis is used to reach that level of excellence. Factor analysis is a statistical approach for identifying and reducing a large number of survey items into particular dimensions or constructs under the variables found in the study. This method is also a solution to remove items that overlap and have the same meaning [23]. Explain the relationship between all variables and all extracted factors in factor analysis [11]. Appropriate use of EFA requires intelligent and informed researchers to make decisions.

Therefore, an EFA analysis using the varimax rotation solution was done on the 40 culturally responsive leadership items. This research found that seven items do not exceed the required minimum value for the loading factor, which is 0.6. This situation required the researcher to drop items that did not reach the minimum factor fit value and made only 33 items accepted. According to the eigenvalue, all of the components recorded values of 2.03 or above, which is above 1.0. The eigenvalue is an indication that determines the formation of the required number of components in the actual research instrument [20]. It can be concluded that all items in the dimension have a high degree and that all study components should be maintained [11]. Next, look at the results of the Bartlett's Test for Sphericity; the KMO value is 0.86, indicating that the sample size is suitable. The use of factor analysis is suitable if the KMO value is more than 0.70 [11], [33]. While the cumulative variance of the formation of EFA is 65.16%. It shows that these four components for 65.16% account for the variance change. This value is sufficient to determine the composition of the research instrument because it is limited exceeding the minimum amount of 60% [34].

A reliability analysis makes up the second analysis. In addition to fulfilling the established objective criteria, high instrument reliability helps in the acquisition of more accurate data [20]. Findings are shown the reliability value of the components formed in the study instrument. Overall, the instrument's Cronbach's alpha value (α) is 0.93, which is very high. Four of the produced components also have a very high value, which ranges from 0.87 to 0.93. Discovery shows that the item has very good and high reliability. To determine the reliability of this research instrument, a Cronbach alpha value between 0.7 and 0.8 is acceptable, and a lower Cronbach alpha value means the reliability of the instrument is also lower [11]. A Cronbach alpha coefficient value of around .90 is considered "excellent", around 0.80 is "very good", and a value of around 0.50 to 0.79 is adequate. While values less than 0.50, it is considered unacceptable [29]. As a result, this instrument has a high level of credibility and reliability, making it suitable for future research to assess the level of leadership practices that are culturally responsive in Malaysia's small schools.

5. CONCLUSION

This study is intended to increase the contribution to the field of measurement in the development of culturally responsive leadership instruments, especially in the context of small schools in Malaysia. The results of the research conducted have successfully developed 33 items that can change the practice of responsive cultural leadership in Malaysia, especially in small schools. Based on the findings obtained in this research, it can be concluded that culturally responsive leadership instruments have been developed and can be used to implement leadership practices. This is based on testing each item, which shows reliability. The results of the EFA analysis test have also proven that all four dimensions of culturally responsive leadership, with 33 items each, have met the criteria of a good and reliable instrument, as well as having a good level of content validity and construct validity. Next, the KMO value obtained in this study shows that there is a suitable item according to its dimensions. The findings of this study are also supported by Cronbach's alpha value of 0.93 for this culturally responsive leadership instrument. This finding explains that this culturally responsive leadership instrument has a very good consistency and high reliability.

In conclusion, this research's findings have resulted in the creation of an instrument for leadership, especially in Malaysia. The leadership strategies used by school leaders in Malaysia, particularly in small schools, can be implemented using the culturally responsive leadership instrument that has been developed. In order to measure the level of culturally responsive leadership practices in small schools, decision-makers can use a valid instrument. According to the instrument's excellent reliability and validity, it is recommended to be utilized as the best instrument for measuring culturally responsive leadership practices among Malaysian school leaders. This instrument can also be used as a reference and guidance for the development of future leadership-related assessment instruments.

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