

DEVELOPING CULTURAL INTELLIGENCE TEST FOR BASIC EDUCATION TEACHERS IN MYANMAR

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Abstract

The main aim of this study is to develop cultural intelligence test for basic education teachers in Myanmar. A total number of 620 teachers (92 males and 528 females) from Mandalay Region, Yangon Region and Ayeyarwaddy Region participated in this study. The participants were collected by using random sampling method. Test items were received from “Diagnosing your cultural intelligence” of Christopher Earley and Elaine Mosakowski (2004), “Cultural intelligence scale” of Ang et al. (2007) and “11-dimension Expanded CQ scale” of Van Dyane et al. (2012). Cultural Intelligence test consists of four factors; metacognitive, cognitive, motivational and behavioural. Pilot testing was done with the sample of 50 basic education teachers from Madaya Township in Mandalay Region. In this pilot testing, 67 items was contained. After that, Cronbach alpha was conducted. According to the results, Cronbach alpha value for Cultural Intelligence Test was 0.95 and cronbach alpha values for each dimension were also high. Then, field testing was conducted with 620 basic education teachers from selected Regions. Exploratory factor analysis and confirmatory factor analysis have been used to analyze the data. After loading exploratory factor analysis, four items which are not correlated with any factors are removed. Cultural Intelligence test, a four-factored construct consisting of 63 items explaining 43.351 % of total variance is obtained. According to the result of confirmatory factor analysis, its reliability and validity is also good enough to be used as an instrument to study cultural intelligent of basic education teachers.

Keywords: Cultural Intelligence, Exploratory factor analysis, Confirmatory factor analysis

Introduction

Today, enhancing organizational performance and increasing productivity are among the key objectives of organizations for achieving sustainable development. In this regard, the role of human resources, especially in varying occupational and organizational conditions, is of particular importance. The cultural diversity may act as a challenge for teachers because the ability to interact effectively in multiple cultures is not a skill possessed by all. As teachers continue to work with an increasingly culturally and linguistically diverse student population, their role has become more complex in addressing not only the academic and institutional demands of their work, but also the interpersonal and intrapersonal demands of meeting the needs of all learners. Teachers who thoroughly understand different cultural systems are able to interpret symbols from one frame of reference to another, can mediate cultural incompatibilities, and know how to build bridges or establish linkages across cultures that facilitate the instruction process. Teachers higher in CQ can more easily navigate and understand unfamiliar cultures, theoretically, they are expected to be more successful when working and communicating with cultures other than their own. Cultural intelligence helps teachers to think more deeply about their own cultural intelligence capabilities as well as help them to apply these ideas in the teaching-learning process. Teachers can also use cultural intelligence to monitor their own actions as well as those of their students. Therefore, this study intends to develop cultural intelligence test for examining the cultural intelligence of basic education teachers in Myanmar.

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Purpose of the Study

The main aim of the present study is to develop Cultural Intelligence Test for basic education teachers in Myanmar.

Definition of Key Term

Cultural Intelligence: an individuals' ability to perform in an effective manner in a culturally diverse setting (Ang & Dyne, 2008).

Exploratory factor analysis: a classical formal measurement model that is used when both observed and latent variables are assumed to be measured at the interval level (Thompson & Daniel, 1996).

Confirmatory factor analysis: a popular statistical method for providing support of construct validation in the psychological assessment literature (Thompson & Daniel, 1996).

Related Literature Review

Cultural Intelligence

In 2003, Christopher Earley and Soon Ang introduced the concept of Cultural Intelligence (CQ) to the social sciences and management disciplines. CQ is an extension of theory associated with contemporary approaches to understanding multiple intelligences. CQ has its roots in interpersonal intelligence (Gardner, 1983) and also in social emotional intelligence (Goleman, 1995; Goleman & Boyatzis, 2008) which is the ability to recognize, understand, and manage emotions both in ourselves and in others. Based on Sternberg and Detterman's Integrative Theoretical Framework on Multiple Loci of Intelligences, Ang et al. (2007) defined CQ as a multidimensional construct with four dimensions: metacognitive, cognitive, motivational, and behavioral.

Metacognitive CQ is the person's cultural consciousness and awareness of cultural cues during interactions with people from other cultural backgrounds (Ang & Van Dyne, 2008). It includes processes such as planning, monitoring and revising mental models of cultural norms for different countries or groups of people. Cognitive CQ is a competence based on the knowledge of norms, practices, and conventions used in different cultural settings, acquired through education and personal experience (Ang et al., 2008). It includes knowledge of the economic, legal, and social systems of different cultures, as well as the value system of these cultures. Motivational CQ represents a capability to direct attention and energy toward learning about and functioning in situations characterized by cultural differences (Ang et al., 2008). It is an individual's preference to be intrinsically motivated to adapt, to understand, to relate, and to adjust to diverse cultures. Finally, behavioral CQ refers to the capability to exhibit appropriate verbal and nonverbal behavior when interacting with people from different cultures (Ang et al., 2008).

Method

Sampling

The population for this study included basic education teachers from selected regions. A total of 620 basic education teachers were selected. Among them 92 were male teachers and 528 were female teachers. In order to ensure the representation of all basic education teachers, a random sampling method was applied. Basic Education teachers of one region from Upper Myanmar (Mandalay Region) and two regions from Lower Myanmar (Yangon Region and Ayeyarwaddy Region) were participated.

Research Method

In this study, the researcher used descriptive survey design and quantitative approach.

Research Instrumentation

Test items for cultural intelligence test were received from the Cultural Intelligence Scale (CQS) by Ang et al. (2007), 11-dimension Expanded CQ scale (the E-CQS) by Van Dyne et al. (2012) and Diagnosing Your Cultural Intelligence by Earley and Mosakowski (2004). As conceptualized by Ang et al. (2007), CQ is a multidimensional construct with four dimensions: metacognitive, cognitive, motivational, and behavioral.

Firstly, the items were modified in Myanmar Language. With respect to conformity of meaning, the experts in the field of Educational Psychology were requested to do the editorial review of items. In order to validate the instrument, pilot testing was done with the sample of 50 basic education teachers from Madaya Township in Mandalay Region. In this pilot testing, 67 items for Cultural Intelligence Test were contained. And then, reliability analysis was made by using Cronbach’s alpha value. When analyzing for test reliability, the internal consistency reliability (Cronbach’s alpha) was 0.95. Thus, it is obvious that the internal consistency of Cultural Intelligence Test was high. Then, the test was administered to 620 basic education teachers from selected Region for the field testing. The data obtained were analyzed by using exploratory factor analysis and confirmatory factor analysis.

Data Analysis and Research Findings

Exploratory Factor Analysis of Cultural Intelligence Test

Before the exploratory factor analysis, the appropriate of subscales for factor analysis was assessed. Table 1 gives information about two assumptions of factor analysis. To determine if the subscales were suitable for factor analysis, the Bartlett Test of Sphericity and KMO (Kasier-Meyer Olkin Measure of Sampling Adequacy) tests were used. The first test examined if the subscales of the scale are inter-independent, and the latter examined sample sufficiency. As shown in Table 1, $KMO=0.944>0.70$ indicated that the sample data are suitable for factor analysis (Hair et al., 2006). The Bartlett’s Test ($p<0.001$) showed that the correlations coefficients are not all zero. As a result, both assumptions required for factor analysis are satisfied.

Table1: The results of KMO and Barlett’s tests

Kasier-Meyer-Olkin Measure of sampling		.944
Bartlett’s Test of Sphericity	Approx. Chi-Square	39082.276
	Df	2211
	Sig	0.000

After this, Figure 1 shows a scree plot of eigenvalues plotted against the factor numbers. The criterion of Eigenvalue>1 was used for determining the number of the factors the graphic. In figure 1, the curve has an instant it could be interpreted that the scale has four factors.

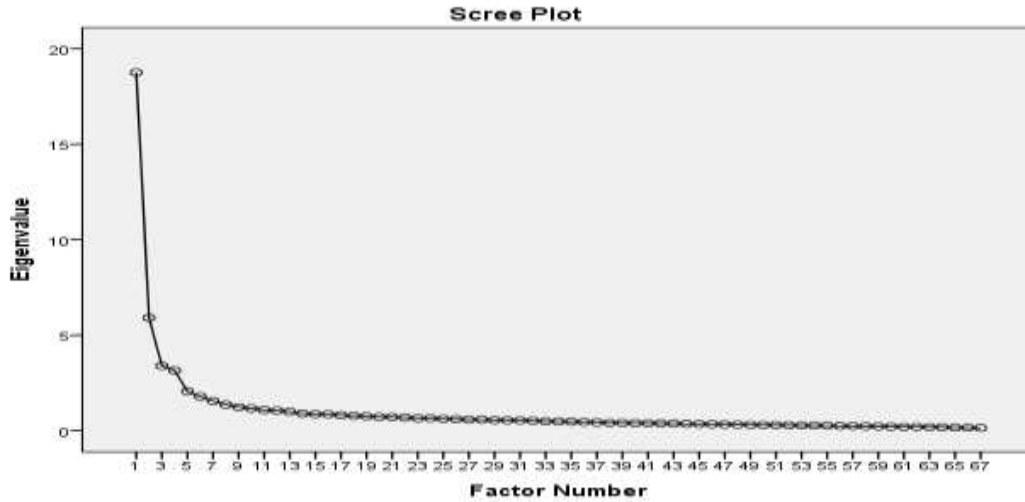


Figure 1: The Scree plot of Cultural Intelligence Test

A Principal axis factoring was run with varimax rotation to check the scale construct validity. In Table 2, four factors explaining 43.351 % of total variance were obtained. First factor explained 12.754% of total variance and has factor loadings ranging from 0.509- 0.771. Second factor explained 12.597% of total variance and has factor loadings ranging from 0.405-0.791. Third factor explained 10.331% of total variance and has factor loadings ranging from 0.427-0.685. Fourth factor explained 7.669 % of total variance and has factor 4 loadings from 0.416-0.698. After loading exploratory factor analysis, items of CQ16, CQ33, CQ14, CQ32 are not correlated with any factors and they are removed. By this way, a four-factored construct consisting of 63 items explaining 43.351 % of total variance is obtained.

Table2: Factor loadings for principle axis factoring with Varimax Rotation on Cultural Intelligence items

Items	Factor			
	1	2	3	4
CQ55	.771			
CQ54	.764			
CQ58	.763			
CQ59	.734			
CQ53	.717			
CQ56	.704			
CQ52	.678			
CQ64	.652			
CQ51	.631			
CQ66	.628			
CQ65	.609			
CQ67	.561			

Items	Factor			
	1	2	3	4
CQ60	.561			
CQ57	.560			
CQ63	.556			
CQ61	.547			
CQ62	.509			
CQ23		.791		
CQ26		.759		
CQ21		.755		
CQ22		.749		
CQ25		.701		
CQ30		.692		
CQ28		.671		
CQ17		.608		
CQ19		.598		
CQ15		.592		
CQ18		.573		
CQ29		.538		
CQ31		.527		
CQ24		.515		
CQ27		.503		
CQ14		.493		
CQ20		.405		
CQ49			.685	
CQ46			.673	
CQ48			.664	
CQ47			.659	
CQ50			.618	
CQ40			.616	
CQ39			.608	
CQ41			.601	
CQ43			.583	
CQ38			.576	

Items	Factor			
	1	2	3	4
CQ37			.485	
CQ36			.474	
CQ42			.467	
CQ44			.436	
CQ35			.434	
CQ45			.427	
CQ4				.609
CQ8				.570
CQ7				.564
CQ6				.549
CQ2				.548
CQ5				.528
CQ11				.508
CQ12				.497
CQ3				.493
CQ9				.492
CQ1				.463
CQ10				.462
CQ13				.416
% of total variance	12.754%	12.597%	10.331%	7.669

Each factor was named in accordance with the construct explained by the items. First factor could be named as Behavioral CQ. The items under this factor consisted of 17 items with loadings between 0.509 - 0.771% of total variance. Second factor could be named as Cognitive CQ. The items under this factor consisted of 17 items with loadings between 0.405 - 0.791% of total variance. Third factor could be named as Motivational CQ. The items under this factor consisted of 16 items with loadings between 0.427- 0.685% of total variance. Fourth factor could be named as Metacognitive CQ. The items under this factor consisted of 13 items with loadings between 0.416- 0.609% of total variance. Therefore, this test contains total items of 63 and is generally said to be reliable and valid measure. Next, in order to more reliable, confirmatory factor analysis on cultural intelligence test is also computed.

Confirmatory Factor analysis on Cultural Intelligence Test

Confirmatory factor analysis was also used to establish the four factors of cultural intelligence test. According to Hu and Bentler (1999), the maximum cutoff value of 0.8 for RMSEA and the maximum cutoff value of 0.90 for TLI and CFI and a p-value for the Chi square less than 0.005 can be considered as the model is a good fit. Fit indices for assessing the goodness of fit in confirmatory factor analysis is presented in Table 3.

Table 3: Fit Indices for Assessing the Goodness of Fit in Confirmatory Factor Analysis (Bentler, 1999)

Name	Index	Level of acceptance
Discrepancy chi square	Chisq	0.000
Root Mean Square of Error of Approximation	RMSEA	<0.08
Comparative fit index	CFI	>0.90
Tucker-Lewis Index	TLI	>0.90

Table 4: Model Fit Indices of Cultural Intelligence Test

Cultural Intelligence Test	Chisq	RMSEA	CFI	TLI
	0.0000	0.051	0.890	0.906

The data of fit of the models of cultural intelligence test was examined in Table 4. Based on the data presented in Table 4, CFI and TLI was nearly 0.90 and RMSEA ranged from 0.05 to 0.1 and chi-square was found significant at $p < 0.05$. Therefore, the model fit indices of cultural intelligence test with 63 items.

Validity and Reliability of Cultural Intelligence Test

Convergent Validity

Convergent validity is also an evidence to test construct validity. To establish convergent validity, factor loading of the indicator variables, composite reliability (CR) and average variance extracted (AVE) should be used. AVE and CR values were computed by the formula using Microsoft Excel. Table 5 showed that the result of AVE and CR of cultural intelligence test.

Table 5: Construct reliability (CR) and average variance extracted (AVE) of Cultural Intelligence Test

Factor	CR	AVE
Mecognitive CQ	0.881	0.57
Cognitive CQ	0.928	0.622
Motivational CQ	0.912	0.647
Behavioral CQ	0.917	0.836

The AVE values for the model ranged from 0.57 to 0.836. The CR values ranges from 0.881 to 0.928. According to Fornell and Larcker (2011), AVE should be above 0.5 and CR should be 0.6 and above. According to Table 5, AVE values were above 0.5 and CR values were above 0.6 so that convergent validity was achieved for this construct. Cultural intelligence test was assumed that it was a valid instrument to measure cultural intelligence of basic education teachers in Myanmar.

Discriminant Validity of Cultural Intelligence Test

Discriminant validity was used to show that the construct is actually differing from one another empirically. Discriminant validity was evaluated with square root of AVE with correlations of latent construct. The results were shown in Table 6.

Table 6: Square root of AVE with Correlations of Latent Factors of Cultural Intelligence Test

Factors	Mecognitive CQ	Cognitive CQ	Motivational CQ	Behavioral CQ
Mecognitive CQ	<i>0.755</i>			
Cognitive CQ	0.500	<i>0.788</i>		
Motivational CQ	0.510	0.552	<i>0.804</i>	
Behavioral CQ	0.455	0.386	0.616	<i>0.836</i>

The diagonal numbers in italic are the square root of AVE values.

According to Table 6, all the square root of AVE values was greater than 0.5 and these values were greater than all the inter-latent factor correlations for all factors in the relevant rows and columns. According to Fornell and Larcker (2011), square root of AVE should be above 0.5. Then, according to Hair et al (2011), square root of AVE values was greater than the inter-latent factor correlations. Thus, the results of the discriminant validity of Cultural Intelligence Test were congruent with Fornell and Larcker and Hair et al (2011). According to Table 6, discriminant validity can be accepted for the measurement model and the discriminant model and the discriminant validity between the constructs.

Reliability of Cultural Intelligence Test

After the result of confirmatory factor analysis of Cultural Intelligence Test, it consisted of four subscales with 63 items in this study. Table 7 showed that the number of items and described reliability coefficient for each subscale of Cultural Intelligence Test.

Table 7: Number of Items retained and Reliability Coefficient for each subscale of Cultural Intelligence Test

Factor	Number of items	Cronbach's Alpha
Mecognitive CQ	13	0.862
Cognitive CQ	17	0.931
Motivational CQ	16	0.914
Behavioral CQ	17	0.941

Based on Table 7, reliability coefficient of each subscale ranged from 0.862 to 0.941 and the reliability coefficient of Cultural Intelligence Test was 0.950. Thus, cultural intelligence test was reliable to measure Cultural intelligent of basic education teachers in Myanmar.

Discussion

In order to promote teacher quality, recently researchers have proposed and developed the concept of CQ to better understand and explain differences in cross-cultural effectiveness. To measure CQ, many researchers developed the cultural intelligence scale, which has been used in an increasing number of studies. However, the validity of previous CQ studies might be questionable, due to the omission of discriminant validity tests. To overcome these limitations, this research examines the validity and reliability of the CQ construct by testing the Cultural

Intelligence Test with a sample of 620 basic education teachers. Cultural Intelligence Test provides satisfactory reliability, convergent validity and discriminant validity. As does any research, this research contains some limitations. This research used self-reported Cultural Intelligence Test, further research could use peer or superior reviewed measures to obtain more objective data. Alternatively, other measurement methods could be applied. To prevent measures of attitudes rather than adaptation behavior, the use of role- playing and critical incident techniques might be beneficial.

Conclusion

In this research, Cultural Intelligence Test for Myanmar Basic Education Teachers was constructed by using exploratory and confirmatory factor analysis. Firstly, Cultural Intelligence Test contained 67 items. However, after loading factor analysis, four items that are not correlated with any factor were discarded. Therefore, final Cultural Intelligence Test with a four-factored construct consisting of 63 items explaining 43.351 % of total variance is obtained. This test will give good enough information about cultural intelligence of basic education teachers in Myanmar.

Acknowledgements

I would like to express my sincere appreciation and gratitude to those whose support and encouragement made this research possible. First and foremost, I would like to offer respectful gratitude to Rector Dr. Kay Thwe Hlaing, Pro-rector Dr. May Myat Thu, Pro-rector Dr. Khin Khin Oo, Pro-rector Dr. Nyo Nyo Lwin, and Professor of Yangon University of Education for their official permission to do this research. Especially, I am grateful to Dr. Khin Hnin Nwe (Professor and Head of Department of Educational Psychology, Yangon University of Education), Dr. Ei Mon Mon Aung (Lecturer, Department of Educational Psychology, Yangon University of Education), and Dr. Su Myat Aye (Lecturer, Department of Educational Psychology, Yangon University of Education) for their encouragement and valuable comments. Finally, I am especially grateful to participants for their cooperation and time given to enable this research to be possible.

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