Confirmatory Factor Analysis of Multicultural Leadership Development for Chinese School Administrators in Northeast Region of Thailand

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Abstract

This study aimed to explore factors and related indicators of multicultural leadership development for Chinese school administrators in northeast region of Thailand. The researchers conceptualized the factors and indicators by examining related documents and cross-examining with five experts to confirm them. A quantitative research design using questionnaire to 255 respondents consisting of 90 school administrators and 165 teachers. The results indicated that goodness of fit for the identified factors and indicators are compliance with empirical data: $\chi^2 = 74.564$, $df = 47$, $\chi^2/df = 1.586$, p-value = 0.064, RMSEA = 0.048, SRMR = 0.021, CFI = 0.989, TLI = 0.984.

Keywords: *Confirmatory factor analysis, Chinese school administrators, indicators, multicultural leadership development model*

Introduction

Multicultural leadership development refers to the process of preparing individuals to lead and work effectively in diverse and multicultural environment (Webb et al., 2013). As the global workforce becomes increasingly diverse, school organizations recognize the importance of cultivating school administrators who can navigate and leverage the benefits of cultural diversity. As a result, school administrators can enhance their ability to thrive in diverse markets, foster innovation, and create inclusive workplaces where all teachers can contribute their best by investing in multicultural leadership development (Vinney, 2024, February 20). In global perspective, school administrator is encouraged to adopt a global mindset and understand the implications of cultural differences on educational administration. Subsequently, exposure to international experiences, either through work assignments or cultural immersion programs, can be valuable (Webb et al., 2013)

Multicultural leadership is a style of leadership that emphasizes the ability to effectively lead and manage diverse teams in a multicultural environment. Therefore, multicultural leadership development involves a set of skills, attitudes, and behaviours, namely personnel development (Nonye, et al., 2019), multicultural educational management (Arya Sunu, 2020), multicultural communication (Strani et al., 2023), and multicultural competencies (Wilson, 2013) that contribute to creating an inclusive and harmonious work environment (Uma & Lesley, 2012). Nonye et al. (2019) emphasized the crucial role of personnel development in the overall framework of multicultural leadership development. It involves the intentional and systematic

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process of enhancing the skills, knowledge, and capabilities of teachers within a school. In the multicultural leadership model, personnel development contributes to building a workforce that is culturally competent, adaptable, and capable of leading diverse teams effectively. By integrating personnel development into a multicultural leadership development model, school administrators can empower their workforce to thrive in diverse environments, foster inclusive leadership behaviours, and contribute to the overall success of the school in a global context (Nonye, et al., 2019).

According to Arya Sunu (2020), multicultural educational management involves the effective administration and leadership of schools in diverse and culturally rich environments. It focuses on creating an inclusive and equitable learning environment that respects and values the diverse backgrounds perspectives, and experiences of students and teachers. Effective multicultural communication for school administrators is crucial for fostering an inclusive and supportive educational environment (Strani et al., 2023). In other words, school administrators who prioritize multicultural communication strategies, contribute to a more inclusive, respectful, and welcoming educational environment. Effective communication is crucial in multicultural leadership because school administrators need to be skilled in cross-cultural communication, ensuring that messages are clear, respectful, and accessible to individuals from various cultural backgrounds (Strani et al., 2023). Therefore, effective multicultural communication fosters positive relationships, supports student success, and creates a sense of belonging for all members of the school community (Strani et al., 2023). Wilson (2013) defined multicultural competencies for school administrators involve a set of skills, knowledge, and attitudes that enable effective leadership in diverse educational settings. By embodying these multicultural competencies, school administrators can contribute to the creation of an inclusive and culturally responsive educational environment, ultimately promoting positive learning outcomes for all students (Wilson, 2013).

The above literature has suggested that school administrators' preparation and training do not adequately provide the necessary multicultural knowledge, awareness, and skills. Consequently, the researchers would like to explore fully how a Chinese school administrator might develop multicultural leadership practice or factors and related indicators may develop Chinese school administrator's multicultural leadership style. In short, this study aimed to explore factors and related indicators of multicultural leadership development model following by examination of its goodness of fit with empirical data.

Materials and Methods

Research Design and Research Procedure

An explanatory research design with a cross-sectional approach is a study design that combines elements of both explanatory and cross-sectional research (Creswell & Plano Clark, 2011). The primary goal of explanatory research is to explore and explain the relationships between variables. This explanatory research design aims to uncover the reasons behind a particular phenomenon or behaviour. Explanatory research goes beyond describing relationships by seeking to identify causal factors and understand the underlying mechanisms at play (Gay et al., 2009). In the first phase, the researchers conducted a thorough document analysis to analyze relevant previous literature, reports, and public policies to identify the important factors and indicators associated to multicultural leadership development. The explanatory research design was used to provide a deeper understanding of the observed relationships to identify key factors

and indicators associated to multicultural leadership development model by interviewing the five experts (Morgan, 2022).

In the final phase, a cross-sectional approach involves collecting data from a sample of the population at a single point in time was employed. The aim of using cross-sectional approach was to capture a snapshot of the population's characteristics or behaviours (Gay et al., 2009). Cross-sectional studies are non-longitudinal, meaning they do not follow the same teachers over time. Instead, data is collected from different teachers or groups simultaneously (Gay et al., 2009). The data collection occurs at a specific moment, allowing the researchers to analyze the relationships between variables at that particular time. The researchers combined explanatory research with cross-sectional approach. The focus of this design is on exploring and explaining the relationships between variables rather than merely describing them. Causal relationships and underlying mechanisms were investigation to provide a more in-depth understanding of the observed phenomena. The explanatory aspect might involve the use of statistical techniques or additional analysis to uncover the reasons behind the observed patterns.
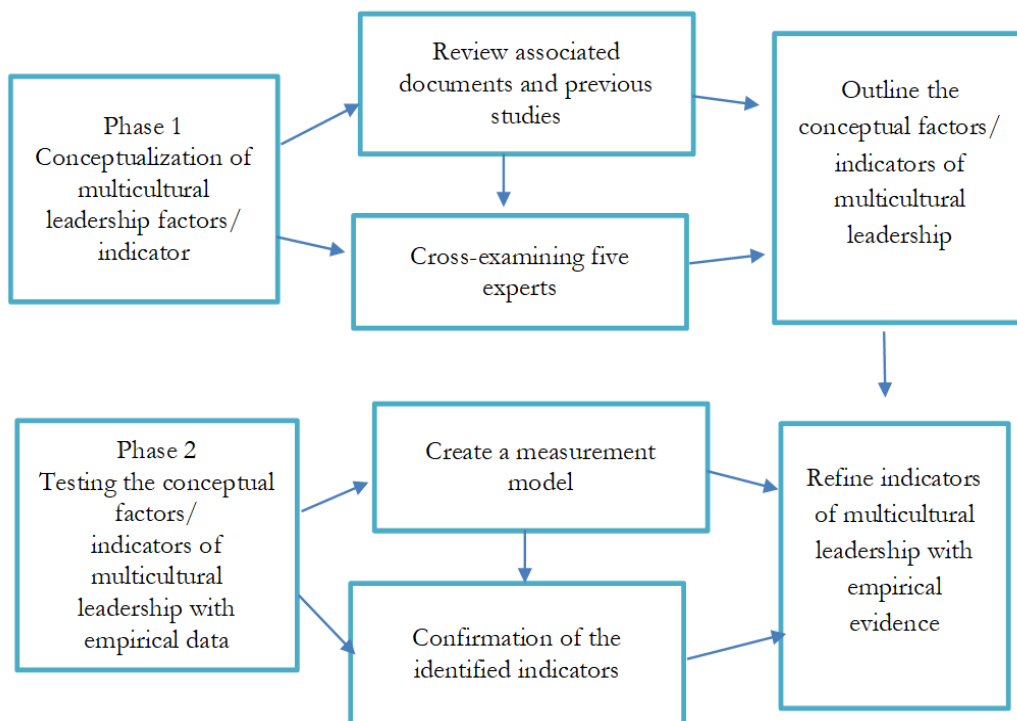
Figure 1. Research Procedure.

Population and Sampling

Stratified random sampling is a basic and widely used method while the researchers employ a research design with a cross-sectional approach. First of all, the researchers selected the entire group of Chinese school administrators in northeast region of Thailand to make inferences about. Then, stratified random sampling method was employed by dividing the population into two subgroups, namely school administrators and teachers. Then, a random sample was independently selected from teacher subgroup. This method ensures representation from each subgroup, allowing for more accurate analysis and conclusions (Gay et al., 2009). Table 1 shows the distribution of population and sample groups.

Table 1: Distribution of Population and Sample Groups.

No.	Name of the School	Population		Sample Size	
		Administrator	Teacher	Administrator	Teacher
1.	Vanichnukul School	4	150	4	20
2.	Udonwittaya School	3	103	3	14
3.	Kiaownum School	3	90	3	12
4.	Khonkaen Huakhiew Wittayalai School	5	85	5	11
5.	Bamrungwittaya School	3	80	3	11
6.	Wanitwittaya School	4	80	4	11
7.	Kengtek School	9	75	9	10
8.	Nongkhai Huaqiao Gonghug School	2	75	2	10
9.	Huakhiao School	5	68	5	9
10.	Juihuawittaya School	5	65	5	9
11.	Yasothon Wittayakhan School	3	52	3	7
12.	Hua Qiao Ubonratchathani School 2	6	50	6	7
13.	Suying School	5	49	5	7
14.	Tekkadaruntham School	8	45	8	6
15.	Banphai Wittaya Foundation School	4	39	4	5
16.	Ngaengkuang School	4	38	4	5
17.	Koratwittaya School	8	35	8	5
18.	Huachiewgonghak Ubon School	5	24	5	3
19.	Tongjia School	4	20	4	3
	Total	90	1223	90	165

Research Instruments and Data Analysis

Field notes were the research instrument for document analysis to determine the factors and indicators of multicultural leadership development. The researchers started each field note by recording essential details about the documents the researchers were analyzing them. The document details include information such as the title, author, date, source, and any relevant contextual information. This helps in identifying and referencing the document later (Gay et al., 2009). The researchers summarized the content of the field notes to provide an overview of the document's content. The researchers identified the main themes, arguments, or ideas that related to quality culture presented in the documents. This was followed by noting any key findings, evidence, or examples that support the document's central message (Gay et al., 2009).

The researchers employed a questionnaire consisted of 36 items with five-point Likert scale as a tool for collecting quantitative data from respondents. The questionnaire was administered as an online survey using closed-ended items. These closed items were clear concise and appropriately worded to elicit the desired information that fit into four pre-determined factors and 12 indicators from the findings of the first phase. Before administering the questionnaire to the full sample, the researchers conducted pilot testing to identify the address any issues with question wording, formatting or sequencing. A continuous five-point Likert scale was used to evaluate 255 respondents' perceptions of multicultural leadership development. There were five sections with a total of 36 items consisting of four items about demographic information and 32 items about four factors of multicultural leadership development.

Section A collects basic demographic data about the respondents namely age, gender, educational level, and work experience. Section B to Section E which was particularly designed by the researchers to obtain data about the personnel development, multicultural educational management, multicultural communication, and multicultural competencies, respectively.

Thematic analysis was the methodology used to systematically analyze and interpret qualitative data, that was text documents obtained from the first phase to identify patterns, themes, and relationships within the data (Kibiswa, 2019). Firstly, the researchers developed a coding scheme, which was a set of codes that captured different aspects of the content within the documents. The coding scheme should be aligned with the research objective and provide a systematic framework for analyzing the qualitative data. Codes could be predetermined (priori codes) or emerge during the analysis (emergent codes). Secondly, the researchers read and examined each document, systematically applying the coding scheme to identify and assign relevant codes to specific sections, passages, or themes within the text. This process involved systematically categorizing the content based on the coding scheme. Finally, the researchers organized and analyzed the coded data. This could involve creating tables to display the distribution of codes across documents or comparing codes within and across different documents (Kibiswa, 2019).

The researchers employed structural equation modelling (SEM) to analyze quantitative data for developing a multicultural leadership development model. The use of SEM software was to estimate the parameters of the multicultural leadership development model based on the collected data. The estimation process involved iterative calculations to find the best-fitting model that minimized the discrepancy between the observed data and the model's implied covariance structure (Hair et al., 2013). Then, the researchers assessed model fit by evaluating the goodness-of-fit of the estimated model. The goodness-of-fit of the estimated model was examined using various fit indices such as the chi-square test, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). These common fit indices indicate how well the model fits the data and whether the model is acceptable (Hair et al., 2013).

Findings and Discussion

The findings of this study are presented according to the study objectives indicated above. The initial findings were the important factors and indicators of multicultural leadership development conceptualized for Chinese school administrators. Then, the researchers continued to assess the validity of the observable variables using factor loading to examine the goodness of fit of the multicultural leadership development factors and indicators with empirical data.

Identification of Multicultural Leadership Development Factors and Indicators

The findings of document analysis and cross-examined by the five experts have identified four important factors of multicultural leadership development, namely (i) personnel development (PD); (ii) multicultural educational management (EM); (iii) multicultural communication (CM), and (iv) multicultural competencies (CP). A total of 12 indicators were identified by the five experts using cross-examination based on the four factors derived from document analysis. Moreover, there were 12 multicultural leadership development indicators which derived from the four important factors with regards to fit the Thai context. In addition, all five experts agreed to determine a cut-off point as a mean score of more than 3.00, and less than 20 percent

as the coefficient of scattering (CV), to identify those indicators on the foundation of initial studies related to the formation of multicultural leadership development model. Table 2 display the details of the important factors and their indicators of multicultural leadership development.

Table 2: Identification of Factors and their Indicators of Multicultural Leadership Development

Factors	Indicators	Mean	Std. Dev	CV
Personnel development (PD)	Developing personnel knowledge (PD1)	4.397	0.479	10.9
	Encouraging personnel (PD2)	4.425	0.474	10.7
	Motivating personnel (PD3)	4.420	0.519	11.7
Multicultural educational management (EM)	Developing curriculum (EM1)	4.443	0.513	11.6
	Community participation (EM2)	4.546	0.411	9.00
	Promoting equality (EM3)	4.524	0.471	10.40
Multicultural Communication (CM)	Avoiding conflict (CM1)	4.486	0.430	9.60
	Having multicultural communication skills (CM2)	4.539	.446	9.80
	Being awareness of cultural variation (CM3)	4.532	0.447	9.90
Multicultural competencies (CP)	Multicultural attitudes (CP1)	4.610	0.415	9.00
	Multicultural knowledge (CP2)	4.597	0.412	9.00
	Multicultural skills (CP3)	4.622	0.408	8.80

Demographic Data of Respondents

A total of 255 distributed questionnaires were successfully collected from 19 research schools, giving a response rate of 100 percent. The majority of respondents are females (69.41%). The demographic data showed that researchers obtained a comprehensive and representative sample in terms of their age and work experience as a good practice when conducting surveys to gather quantitative data. An equal distribution of respondents in terms of their age, namely 55 (21.57%), 99 (38.82%) 61 (23.92%), and 40 (15.69%) of respondents' age between 21 to 30 years old, 31 to 40 years old, 41 to 50 years old and 51 to 60 years old respectively. On the other hand, findings showed an equal distribution of respondents in terms of respondents' work experience too such as 61 (23.92%) of respondents' work experience was less than six years; 50 (19.61%) of respondents' work experience was between six to 10 years; 44 (17.25%) of respondents' work experience was between 11 to 15 years; 33 (12.94%) of respondents' work experience was between 16 to 20 years; 32(12.55%) of respondents' work experience was between 21 to 25 years, and 35 (13.73%) of respondents' work experience was more than 26 years.

Furthermore, a total of 255 respondents consisted of 90 (35.29%) school administrators and 165 (64.71%) teachers with a majority of them possessing a bachelor's degree as the highest academic level (136, 53.33%). This was followed by 60 (23.53%) of respondents have lower than bachelor's degree, and 47 (18.43%) have a master's degree. Only 12 (4.71%) of respondents were awarded a doctoral degree as the highest academic level. This demographic data of respondents helps the researchers to capture diverse perspectives and insights across different demographic groups. Table 3 demonstrates the demographic data of respondents.

Table 3: Profile of Respondents.

Background	Frequency (N= 255)	Percentage (%)
Gender:		
-Male	77	30.20
-Female	177	69.41
-Other	1	0.39
Total	**255**	**100**
Age		
-21 to 30 years old	55	21.57
-31 to 40 years old	99	38.82
-41 to 50 years old	61	23.92
-51 to 60 years old	40	15.69
Total	**255**	**100**
Work experience		
-<6 years	61	23.92
-6 to 10 years	50	19.61
-11 to 15 years	44	17.25
-16 to 20 years	33	12.94
-21 to 25 years	32	12.55
->26 years	35	13.73
Total	**255**	**100**
Position		
-School administrators	90	35.29
-Teachers	165	64.71
Total	**255**	**100**
Academic qualification		
-Lower than bachelor's degree	60	23.53
-Bachelor's degree	136	53.33
-Master's degree	47	18.43
-Doctoral degree	12	4.71
Total	**255**	**100**

Intercorrelation between Multicultural Leadership Development Indicators

A multicultural leadership development model was then developed by the researchers which representing the identified four factors and 12 indicators through arranging them in a logical manner to reflect their interrelationships. Hence, this model would provide a comprehensive and structured overview of the ethical considerations relevant to multicultural leadership development within the researchers' selected scope. The results of Pearson correlation coefficients were used to assess the linear relationships between pairs of 12 indicators.

Table 4 clarifies the findings of intercorrelation between the 12 indicators of multicultural leadership development indicating that there are positive correlations for all relationships between pairs of 12 indicators. This implies that as one indicator increases, the other tends to increase too. In addition, the magnitude of the correlation coefficients ranged from 0.495 to 0.813 revealing the strengths of the relationships from moderate to strong, with values closer to 1 representing a stronger correlation and all the relationships are statistically significant at 0.01 level. Consequently, results also showed that the relationship between having multicultural

communication skills indicator (CM2) and being awareness of cultural variation indicator (CM3) (r = .815; r<.01) was the highest magnitude of the correlation coefficient. However, the lowest magnitude of the correlation coefficient was community participation indicator (EM2) and having multicultural communication skills indicator (CM2) (r = .495; p<0.01), as illustrated in Table 4.

Table 4: Correlations of Variance / Covariance Matrix of Variables.

	PD1	PD2	PD3	EM1	EM2	EM3	CM1	CM2	CM3	CP1	CP2	CP3
PD1	1.00	.788**	.651**	.660**	.588**	.637**	.558**	.588**	.592**	.613**	.593**	.543**
PD2		1.00	.789**	.613**	.580**	.647**	.601**	.594**	.570**	.565**	.629**	.555**
PD3			1.00	.595**	.570**	.629**	.550**	.553**	.567**	.527**	.583**	.516**
EM1				1.00	.684**	.621**	.534**	.540**	.545**	.569**	.642**	.516**
EM2					1.00	.720**	.505**	.495**	.518**	.550**	.537**	.497**
EM3						1.00	.585**	.524**	.548**	.543**	.538**	.515**
CM1							1.00	.723**	.626**	.560**	.544**	.469**
CM2								1.00	.813**	.543**	.514**	.468**
CM3									1.00	.520**	.585**	.549**
CP1										1.00	.750**	.679**
CP2											1.00	.751**
CP3												1.00

**Correlation Coefficient is Significant at the 0.01 Level (2-Tailed).

The Goodness of Fit of the Multicultural Leadership Development Factors and Indicators with Empirical Data

The researchers intended to attain estimates of the parameters of the multicultural leadership development model, the validity of the identified factors and their factor loading of the multicultural leadership development. In particular, factor loading means the 'relative importance' of the identified indicators that collectively form a specifically identified factor in the multicultural leadership development model of Chinese school administrators that had been considered. The co-variance with the multicultural leadership development factors ranged from 65.30 to 82.30 percent. As shown in the following Table 5, the factor loading of all the multicultural leadership development factors are ranged from 0.808 to 0.907 and is statistically significant at 0.01. The factor with the highest factor loading value is personnel development. This is followed by multicultural educational management, and multicultural competencies. The factor that has the least capacity factor loading value is multicultural communication. As a result, the researchers concluded that all the identified factors are found to be important constructs of multicultural leadership development for Chinese school administrators in northeast region of Thailand.

On top of that, the co-variance with the multicultural leadership development indicators is in the range of 65.20 to 85.20 percent. As illustrated in the Table 5, the factor loading of all the multicultural leadership development indicators are ranged from 0.807 to 0.923 and is statistically significant at 0.01. Following this line of reasoning, all the identified indicators are considered important construct for the multicultural leadership development model.

Table 5: The Results of CFA for Key Factors and Indicators of Multicultural Leadership Development.

Factors and their indicators	Factor Loading			R^2	Coefficient of Score (FS)
	β	S.E.	t		
Personnel development (PD)	0.907	0.020	45.114	0.823	0.003
Developing personnel knowledge (PD1)	0.888	0.020	45.217	0.789	0.134
Encouraging personnel (PD2)	0.896	0.016	54.930	0.802	0.068
Motivating personnel (PD3)	0.872	0.021	45.456	0.760	0.113
Multicultural educational management (EM)	0.894	0.023	38.096	0.800	0.003
Developing curriculum (EM1)	0.863	0.026	33.575	0.745	0.113
Community participation (EM2)	0.807	0.026	31.310	0.652	0.041
Promoting equality (EM3)	0.879	0.024	36.009	0.772	0.133
Multicultural competencies (CP)	0.841	0.027	31.065	0.708	0.003
Multicultural attitudes (CP1)	0.835	0.023	35.565	0.697	0.054
Multicultural knowledge (CP2)	0.905	0.018	50.995	0.818	0.098
Multicultural skills (CP3)	0.821	0.024	33.648	0.674	0.050
Multicultural Communication (CM)	0.808	0.029	27.919	0.653	0.001
Avoiding conflict (CM1)	0.848	0.027	31.030	0.718	0.073
Having multicultural communication skills (CM2)	0.870	0.021	41.941	0.756	0.016
Being awareness of cultural variation (CM3)	0.923	0.020	46.133	0.852	0.102

The multicultural leadership development measurement model whether is acceptable or not in SEM depends on the fit indices, highlighted by Ullman (2001). The findings of goodness of fit indicated that the multicultural leadership development model fits between the obtained values of collected data and the expected values as follows: $\chi^2 = 744.564$, df = 47, p-value = 0.064, CFI = 0.989, TLI = 0.984, RMSEA = 0.048, and SRMR = 0.021. After referring to the following experts' rules of thumb and their recommended cut-off values, the researchers concluded that the related real values are fitting to the expected values in the multicultural leadership development model. Table 6 presents the details of goodness of fit indexes and their interpretations.

Table 6: Interpretation of Goodness of Fit for Multicultural Leadership Development Model.

Goodness of Fit Index	Real Values	Rules of Thumb or Cut-off Values	Specialist	Interpretation
χ^2/df	1.586	<2 <5	Ullman (2001) Schumacker and Lomax (2004)	Pass
CFI	0.989	≥ 0.95	Hu and Bentler (1999)	Pass
TLI	0.984	≥ 0.95	Hu and Bentler (1999)	Pass
RMSEA	0.048	<0.06 <0.07	Hu and Bentler (1999) Steiger (2007)	Pass
SRMR	0.021	<0.05	Byrne (1998)	Pass

Based on the above discussion, researchers finalized the multicultural leadership development model is approved with the empirical data. Hence the researchers established precise and significant paths of the multicultural leadership development model as illustrated in Figure 2.
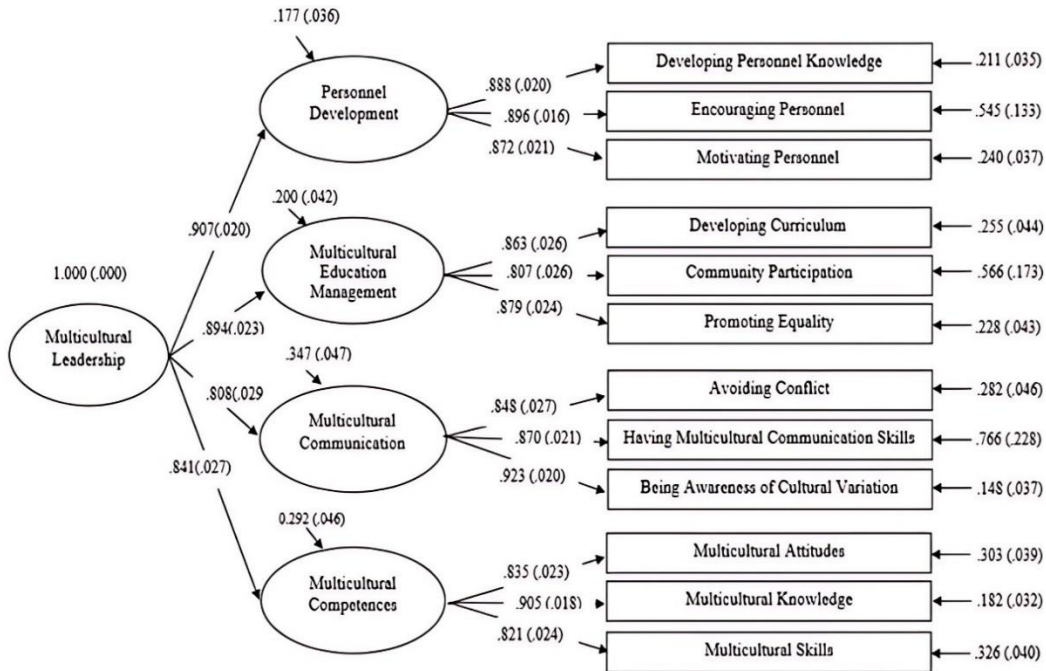

Figure 2: Multicultural Leadership Development Model.

Conclusion

The findings of this study indicated that Chinese school administrators can develop their multicultural leadership development by incorporating the four components and their indicators into multicultural leadership development that encourage a culture of continuous learning where Chinese school administrators stay informed about cultural trends, global developments, and best practices in multicultural leadership. The findings are reinforced by the past research such as Vinney (2024, February 20) and Webb et al. (2013). Overall, multicultural leadership is about recognizing, respecting, and leverage the strengths that diversity brings to a school. Chinese school administrators who embrace multicultural leadership contribute to the creation of inclusive workplaces that celebrate differences and promote collaboration among people from various backgrounds.

The main finding of this study is proposing and testing a model relating multicultural leadership development with its four important factors and 12 indicators. To address these challenges and leverage multicultural leadership strengths, Thai Ministry of Education should provide training programs that focus on developing cultural competence among Chinese school administrators. This includes understanding and appreciating different cultural norms communication styles, and values. Moreover, findings imply that Chinese school administrators should emphasize the development of effective communication skills across cultural boundaries. Chinese school administrators should be adept at navigating diverse communication styles and adapting their approach to different audiences. However, the specifies of a multicultural leadership

development model may vary based on the educational industry, school size, and other factors. Following this line of reasoning, while a school administrator adopts a multicultural leadership development model, he or she has to involve a comprehensive and on-going commitment from all levels of a school organization.

In conclusion developing a multicultural leadership development model for Chinese school administrators in Thailand has both theoretical and practical implications. Such a model would aim to enhance leadership skills and cultural competence, taking into account the diverse cultural contexts within Thailand. For example, ground the model in established cultural intelligence frameworks, integrating concepts like cultural knowledge, motivation, mindfulness, and behaviour to provide a comprehensive theoretical foundation. On the other hand, design leadership development programs that are tailored to the cultural nuances and educational context in Thailand providing practical skills and strategies for Chinese school administrators to navigate multicultural challenges.

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