Indicators of Resourceful Leadership for Secondary School Principals: Developing and Testing the Structural Relationship Model

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Abstract

The purpose of this descriptive study was to examine the structural relationship model of resourceful leadership indicators for secondary school principals. The proposed model was developed from theoretical frameworks and empirical data collected by using the 5-level rating scale questionnaire. The reliability of the questionnaire was .978. The population consisted of 2,359 secondary school principals under the jurisdiction of the Office of the Basic Education Commission. We employed 20:1 sample members and parameters for the sample size, getting 700. The data analysis was done with the 618 returned questionnaires. The results showed that the proposed model was consistent with empirical data with the following statistical metrics: relative Chi-square (CMIN/DF), root mean square error of approximation (RMSEA), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), comparative fit index (CFI), and normed fit index (NFI). Those were conformed to defined research hypotheses.

Keywords: indicator, resourceful leadership, secondary school principal

1. Introduction

1.1 Research Problem

In 2013, the Teachers' Council of Thailand stipulated the professional standards of the school principals in three areas, namely knowledge and professional experience, teaching performance, and teacher's behavior (code of conduct). Particularly, "being and building leaders" was tremendously highlighted as a key element of teacher's performance to be investigated.

> The 11th Standards of Leadership and Building Leadership-Professional executives create organizational culture by sharing, leading, implementing, and organizing the system aligned with the culture. Those who have successfully completed their tasks are eligible to be nominated for an award. Rewarding leads to self-development, self-determination, self-improvement of all members. Professional executives must be clear on what the corporate culture is and consistently committed to it so that members can act toward the culture accordingly. Thus, the principals should create a sense of accomplishment to all members equally as well as build leadership in all position levels, leading to a true learning of the organization. (Teachers' Council of Thailand, 2013)

In addition, the National Education Act B.E. 2542 (1999) and Amendments (Third National Education Act B.E. 2553 (2010) stated that "the school principals are responsible for managing the education for the optimal benefit, developing quality of the education to keep pace with the rapid change, and constantly seek greater development. By doing these tasks, the leadership of the school principals was a key to success" (Ministry of Education, 2010). Therefore, the leadership of the school principals is a critical topic that educational authorities of Thailand have paid close attention. The previous theories, studies, and researchers also indicated that there are various leadership styles e.g. transformational leadership, spiritual leadership, sustainable leadership, innovation leadership, global leadership, etc. Recently, resourceful leadership has become increasingly addressed in several perspectives as it reflects the abundant intellectual ability of the leaders. However, its definition and practices have been unclearly defined. From the literature review, the sixteen sources were found (National College for Leadership of Schools and Children's Services and C4EO, 2011; Hall, 2014; Wilkes et al., 2011; Self, 2013; Cox, 2008; Robinson, 2009;

Voelte, 2009; Murphy, 2014; Milligan, 2013; Earley, 2015; Parker, 2014; Knowledge Base, 2014; Alphonse, 2011; Jonathan, 2013; Linkedin, 2008; Campbell, 2016).

In 2016, Campbell identified that most intellectual leaders had 70 leadership attributes that were highly referred in most theoretical frameworks. According to the highest frequency of leadership attributes (7 and above), the four critical qualities could be proposed as indicators of Resourceful Leadership (RESOL) Measurement including Having Visions (HAVI), Networks (NETW), Teamwork (TEAM), and Openness to Learn (OPEN), respectively. The result of the present study synthesis contributed to further question: what the sub-components of each key attribute are. Consequently, the sub-components were grouped into the following four models: (1) Having Visions Measurement Model (HAVI) including its three sub-components such as Formulating (HAVI1), Articulating (HAVI2), and Implementing (HAVI3), (2) Networks Measurement Model (NETW) consisting of its four sub-components such as Goals (NETW1), Stakeholders participation (NETW2), Network Management (NETW3), and Interaction (NETW4), (3) Teamwork Measurement Model with its three sub-components such as Creating Learning (TEAM1), Exchange Learning (TEAM2), and Communication (TEAM3), and (4) Openness to Learn Measurement Model (OPEN) including its three sub-components such as Systematic thinking (OPEN1), Creativity (OPEN2), and Self-development (OPEN3), respectively. The integration of the intellectual leadership attributed measurement model and the four-dimensional resourceful leadership measurement model conduced toward the structural relationship model of indicators of resourceful leadership consisting of four main components and its thirteen sub-components as shown in Figure 1.
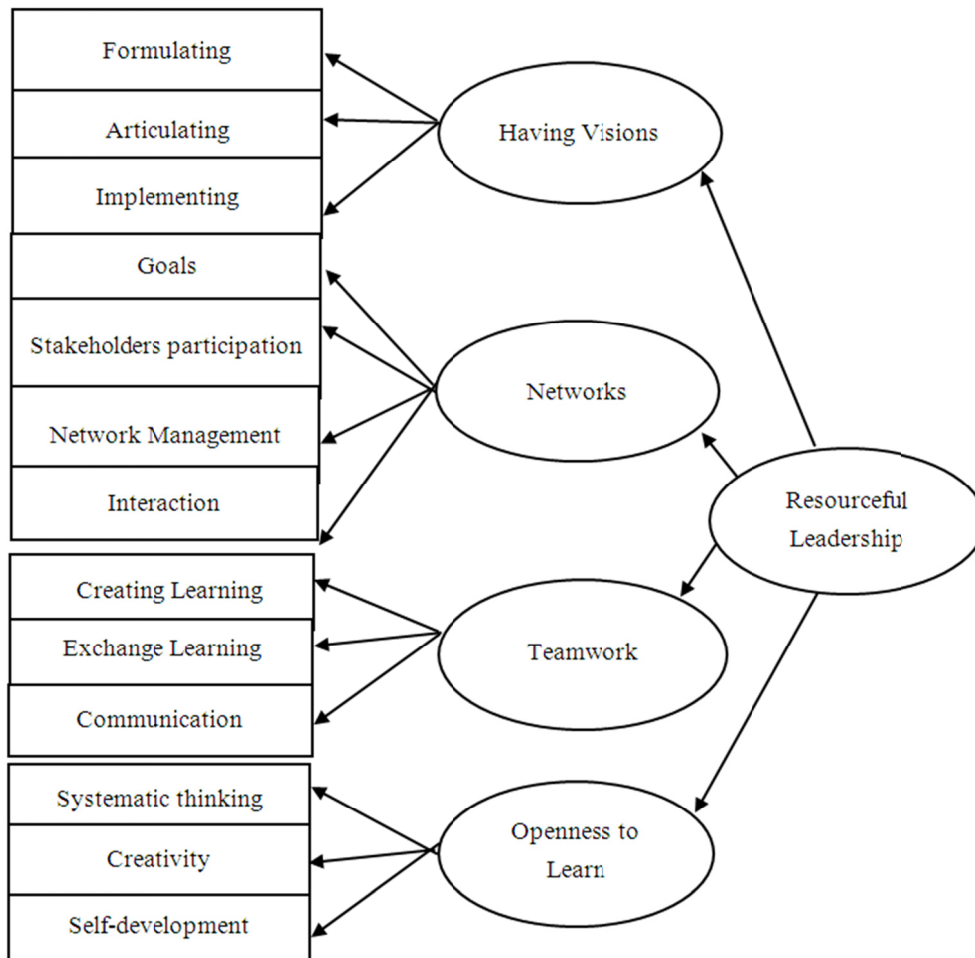

Figure 1. Structural relationship model of indicators of resourceful leadership

According to the model, we examined the operational definition of each sub-component to identify the linkage between the indicators that reflected the leadership behaviors of each sub-component. A total of 57 indicators were

composed of a structural relationship model of resourceful leadership indicators both in the key component and sub-component levels. These indicators were constructed from theoretical or hypothetical models developed by us on theories and recent research background. The proposed model was examined for its consistency with the empirical data collected from the selected samples of the population of secondary school principals nationwide under the jurisdiction of the Office of the Basic Education Commission of Thailand.

1.2 Hypothesis

Structural relationship model of resourceful leadership indicators for secondary school principals was developed from the theoretical frameworks, previous studies and various primary data to identify the key components and sub-components of the model. In the study of Kerlinger and Lee (2000), the Max-Min-Con approach was used to determine the sample size, random techniques, research tools, and data collecting. Therefore, the hypotheses of the present study was formulated as follows: (1) The 57 indicators were examined if they were fitted in the structural relationship model of resourceful leadership for secondary school principals based on the suggestion of Konkarn's (2004) study with the mean ≥ 3.00 and CV $\leq 20\%$, (2) Structural relationship model of the resourceful leadership indicators for secondary school principals developed from theoretical frameworks and previous research were consistent with empirical data as suggested in the study of Hair et al. (2010). The statistical results showed the relative chi-square (CMIN/DF) of 1 -3 or less, the root mean square error of approximation (RMSEA) < 0.05, the goodness-of-fit index (GFI) of 0.90-1.00, the adjusted goodness-of-fit index (AGFI) from 0.90 to 1.00, comparative fit index (CFI) from 0.90 to 1.00, and normed fit index (NFI) from 0.90 to 1.00, and (3) The factor loadings were equal to or greater than 0.70 as recommended for the key components based on Farrell and Rudd (2009), citied in Tojib (2009). According to Tacq (1997), the factor loadings were equal to or greater than 0.30 as suggested for the sub-components and indicators.

1.3 Purpose of the Study

The purpose of the present study was to examine the structural relationship model of resourceful leadership indicators for secondary school principals from the theoretical frameworks and recent research with empirical data. If the existing data was consistent with the empirical findings, the indicators were verified to be used as a prototype model for the development of resourceful leadership for secondary school principals under the Office of the Basic Education Commission. In the study process, testing of the indicators aimed to validate its suitability in the model prior examining the consistency of the proposed model and the empirical data. The factor analysis was also employed to examine the factor loadings of the key components and sub-components as well as indicators, respectively.

2. Method

In this descriptive research, the population included 2,359 secondary school principals of the academic year 2000 (Basic Education Policy and Planning Office, B.E. 2560). The ratio of the sample size to the number of parameters was 20:1 as recommended by Gold (1980). The number of parameters was derived from the combination of 5 latent variables, 13 observed variables, 17 influence lines, and totaling 35 parameters; consequently, the sample of 700 was set in this study. The research tool was questionnaire divided into 2 parts: (a) checklist questions regarding the status of the respondents, and (b) 5-level rating scale questions regarding the level of resourceful leadership for secondary school principals. The 57 questions were categorized into the key components and sub-components. The reliability using Cronbach's method was 0.978. Data were collected from 700 respondents by using proportional random sampling method. The questionnaires were distributed to the secondary school principals by postal mail. The respondents were requested to return the completed questionnaires within three-week period. As a result, a total of 618 questionnaires were returned, or 88.29 percent. The data were analyzed by computer program for the following statistics: (a) Frequency and percentage showing the status of the respondents, (b) Mean and distribution coefficients determining the appropriate set of indicators, (c) Pearson's correlation coefficient and Barlette's Test of sphericity used to verify variables and Kaiser-Meyer-Olkin (KMO) Test used for examining sampling adequacy, and (d) First order confirmatory factor analysis used in the four measurement models (i.e. Having Visions (HAVI), Networks (NETW), Teamwork (TEAM), and Openness to Learn (OPEN)), and second order confirmatory factor analysis used in the Resourceful Leadership (RESOL) measurement model.

3. Results

The results of the mean and distribution coefficients adopted to determine the suitability of the set of indicators to be used in the model showed that the 57 indicators in the four measurement models were appropriate when compared with the criteria of the research hypotheses. The means ranged from 3.77 to 4.88, and the distribution coefficients ranged from 8.21 to 15.33, respectively. From the first order confirmatory factor analysis used to examine the consistency of the measurement model developed from the theoretical frameworks, the results

showed that the four measurement research models were consistent with the empirical data as follows: (a) Having visions (HAVI) measurement model showed CMIN/DF = 0.95, RMSEA = 0.000, GFI = 1.00, AGFI= 0.98 , CFI = 1.00, and NFI = 1.00, (b) Networks (NETW) measurement model showed CMIN/DF = 0.964, RMSEA = 0.000, GFI = 0.99, AGFI= 0.97, CFI = 1.00, and NFI = 1.00, (c) Teamwork (TEAM) measurement model showed CMIN/DF = 0.812, RMSEA = 0.000, GFI = 0.99, AGFI= 0.98 , CFI = 1.00, and NFI = 1.00, and (d) Openness to Learn (OPEN) measurement model showed CMIN/DF = 1.146, RMSEA = 0.015, GFI = 0.99 , AGFI= 0.97, CFI = 1.00, and NFI = 1.00. The results of the second confirmatory factor analysis of the RESOL model showed that CMIN/DF = 1.118, RMSEA = 0.014, GFI = 0.99, AGFI= 0.97, CFI = 1.00, and NFI = 1.00, consistent with the criteria set in the research hypothesis as shown in Table 1.

Table 1. First and second order confirmatory factor analysis

Factors/Components	Factor Loading Matrix			Regression Coefficients
	λ	SE	t	(R^2)
Results of the first order confirmatory factor analysis				
Having Visions Measurement Model (HAVI)				
HAVI1	0.77	-	-	0.59
HAVI2	0.83	0.03	22.23**	0.69
HAVI3	0.84	0.03	18.57**	0.70
CMIN/DF = 0.95, RMSEA = 0.000, GFI = 1.00, AGFI= 0.98, CFI = 1.00, NFI = 1.00				
Networks Measurement Model (NETW)				
NETW1	0.83	-	-	0.68
NETW2	0.91	0.02	27.63**	0.82
NETW3	0.83	0.02	24.45**	0.68
NETW4	0.85	0.03	25.57**	0.72
CMIN/DF = 0.964, RMSEA = 0.000, GFI = 0.99, AGFI= 0.97, CFI = 1.00, NFI = 1.00				
Teamwork Measurement Model (TEAM)				
TEAM1	0.90	-	-	0.81
TEAM 2	0.91	0.02	34.06**	0.83
TEAM 3	0.84	0.02	29.05**	0.71
CMIN/DF = 0.812, RMSEA = 0.000, GFI = 0.99, AGFI= 0.98, CFI = 1.00, NFI = 1.00				
Openness to Learn Measurement Model (OPEN)				
OPEN1	0.84	-	-	0.71
OPEN2	0.83	0.03	23.01**	0.69
OPEN3	0.91	0.03	26.27**	0.83
CMIN/DF = 1.146, RMSEA = 0.015, GFI = 0.99, AGFI= 0.97, CFI = 1.00, NFI = 1.00				
Results of the second order confirmatory factor analysis: Resourceful Leadership Measurement Model (RESOL)				
HAVI	0.90	0.05	19.33**	0.82
NETW	0.97	0.04	23.72**	0.94
TEAM	0.99	0.04	27.98**	0.99
OPEN	0.96	0.04	21.82**	0.92
CMIN/DF = 1.118, GFI = 0.99, AGFI = 0.97, RMSEA = 0.014, CFI = 1.00, NFI =1.00				

The results of factor loadings of the components were described as follows: (a) The key components of the four-dimensional resourceful leadership were statistically significant at 0.90-0.99 with the p-value of .01, (b) The three sub-components of Having Vision factors were positive, ranging from at 0.77-0.83 at the statistical significance level of .01, (c) The four sub-components of Network Building factors were positive, ranging from 0.83 to 0.91 at the statistical significance level of .01, (d) The three sub-components of Teamwork factors were positive, ranging from 0.84-0.91 at the statistical significance level of .01, (e) The three sub-components of Openness to Learning factors were positive, ranging from 0.83 to 0.91 at the statistical significance level of .01, respectively. In addition, the factor loadings of 57 indicators were positive, at 0.43-1.00, and at the statistical significance level of .01. These results showed that the structural relationship model was verified to be used as indicator of resourceful leadership measurement model for secondary school principals since the 4 key components, 13 sub-components, and 57 indicators met the criteria as set in the hypothesis of this study. Thus, the model was developed to be a prototype model to enhance the level of resourceful leadership for secondary school

principals under the Jurisdiction of the Office of the National Education Commission in a structural and effective manner.

4. Discussion

According to the present findings, the mean and distribution coefficients of the total of 57 indicators were in accordance with the criteria. Therefore, the set of indicators was appropriated to be used in the measurement models. In this study, the structural relationship model was developed by using method of empirical definition with the theoretical background. Moreover, the first and second order confirmatory analysis and factor loading analysis using the operational definition were consistent with the previous studies (Chongsatit-au & Pinmanee, 1986, cited in Sanrattana, 2015) mentioning that *"verifying the quality of indicators used in the model was important. Development of the set of indicators should be based on the theoretical concepts. If the indicators were poorly developed, even with the effective statistical method, would lead to the poor model development."* Sanrattana (2015) also stated that *"the study based on theories and research to determine the key components, sub-components, operational definition, and indicator must take validity of the content into account."* In addition, the selected research methodology in this study was in accordance with the Max-Min-Con Approach recommended by Kerlinger and Lee (2000) in determining the sample size, and sampling method. The development of research tools used in the present study was followed by academic principles. The results of the present study were in the line with the findings, purpose of study, research hypothesis, and research methodology of Wadlom (2016)'s study on the topic of the Attributes of Global Leadership for the School Principals under the Office of Basic Education Commission.

From the findings, the model was consistent with the empirical data since the statistical results met the criteria as defined in the research hypothesis. The findings were described into two following perspectives.

(a) From the perspective of theories and research used for developing model, the findings were consistent with the expression or behaviors of samples used in the study. That is, the technological advances contribute to the human's greater access to information at anytime from anywhere, so-called Technologicalization, according to Canton (2006) and Freedman (2011). Particularly in the era of digital globalization, the theory-based information and research is distributed quickly and extensively, compared to the previous decade. McKinsey (2016) defined the 'Internet of Things' in the article of "Disruptive technologies: Advances that will transform life, business, and the global economy" that things are linked to the internet-based world. Human can control devices via the internet, leading to the rapid change for human life in the next decade. Therefore, theories and research used to develop the model in the present study were consistent with the expression or empirical current behavior of samples in the present study.

(b) From the perspective of the empirical data obtained from the samples, it was found that the behaviors indicating the level of resourceful leadership were in the line with the theories and recent research used in the present study. The empirical data were also related to Thailand's National Education Act B.E. 2542 and Amendments (Third National Education Act B.E. 2553 in terms of Professional Autonomy for school principals. Likewise, policy framework or guidelines for the secondary school principal development defined in the 20-year national strategy (2017-2036) combined with the national strategic plan for the National Economic and Social Development No. 12 (2017-2021) has addressed on the educational reform by developing the educational principals in order to increase the effectiveness of the management of educational institutions (Office of the Education Council, 2016). ONEC (2014) also indicated that the leadership of school principals was required to be prioritized in order to meet the expected qualities defined in the National Education 4.0 Policy. The desired leadership attributes of the school principals should enable learners to optimize any available knowledge, to become creative, to develop innovations, and to meet the requirements of today's rapid change. Based on our findings, the development of resourceful leadership for secondary school principals should consider 4 key components, 13 sub-components, and 57 indicators as concluded in the results of this study. The present study also found the factor loading, factor sub-components and indicators, respectively.

Additionally, the results of the present study showed that the structural relationship model of the resourceful leadership for the secondary school principals can be used as "prototype model" to enhance the level of resourcefulness of the secondary school principals by considering the importance of the factors of the key components, followed by sub-components, and the indicators, respectively. Furthermore, the model should be implemented both theoretically and practically. The model can be used in monitoring and evaluation approach to determine how effective the objectives have been completed, and in controlling the organization to ensure that its performance is in accordance with the standards or goals of the organization. Particularly, by adopting the model, the achievement of school leaders and leadership can be examined whether it is in accordance with the professional

standards of school principals as defined by the Teacher's Council of Thailand and Thailand's National Education Act B.E. 2542 and Amendments (Third National Education Act B.E. 2553). This model can be used as a reference for further study as well as academic development, for instance, structural equation modeling, research and development, or participatory action research. In addition, the proposed model defined the key components, sub-components, and the indicators of resourceful leadership for secondary school principals from the grounded theories and related studies to present a holistic model that fits in the current social setting and context of Thailand. Therefore, the results of this study can be used to investigate and compare with different models developed from the related theories and research which helps extend academic knowledge.

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