



Research Article

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Quality Factors of Management for Vocational Education Institutions

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Abstract

Given the rapid advancements faced in modern times, effective leadership is pivotal to the achievement of desired goals, competitiveness and overall success in organizations. This study aims to investigate the construct validity of management quality for vocational education institutions. The sample was 350 directors and deputy directors from vocational education institutions in Thailand, determined through Multistage Random Sampling and the research tool was a questionnaire with content validity and covering 7 sets of factors with a reliability of 0.98. The correlation of variables as determined by Kaiser-Meyer-Olkin is 0.983 and Bartlett's test of sphericity is statistically significant. Therefore, the correlation of variables are sufficient for factor analysis. The results from the construct validity investigation of the quality management measurement model of vocational education institutions by the second order confirmatory factor analysis show that the model conforms to the empirical data derived from Chi-Square= 915.32, df= 857 and p= 0.08167 while χ^2 is not significantly different from 0 at the level of 0.05 and χ^2/df is lower than 2 at 1.0680. In addition, RMSEA= 0.014 and RMR= 0.012, both lower than 0.05, and GFI= 0.900 and CFI= 1.00, higher than 0.90. It was concluded that the quality management measurement model of vocational education institutions has construct validity and conforms to the empirical data.

Keywords: leadership factors, management quality, vocational education institutions

1. Introduction

As we are presently subject to changes that come quickly and aggressively in every dimension, notably affecting economic, social, political and technological perspectives and practices, countries

around the world are struggling to change the paradigm for their citizens in order for them to realize the conditions brought about these changes and adapt to them for the sake of elevating or maintaining their country to be “world class” and capable of being competitive. In Thailand, emphasis was placed not only on organizational structures, processes, procedures and resource management, but significantly on the management systems needed to foster, support and improve overall quality (Office of the Education Council, 2010), which can be achieved by facilitating development of potential administrators through education (Fonseca, 2015) in accordance with the National Education Act of 1999. This legislation’s third amendment of 2010 pertained to vocational education, which is responsible for the development of members of the workforce integral to the nation’s competitive edge, and described vocational education management and vocational training as being provided by state schools, private education institutions, establishments in cooperation between educational institutions as well as industrial ventures (Ministry of Education, 2003). In Thailand, the Office of Vocational Education Commission oversees vocational education management as prescribed by the National Education Act of 1999 and acts to insure that vocational education provides people with the knowledge and skill necessary to prosper in careers, to be self-reliant, and to live with dignity in promotion of the economic development of the community and as a benefit to the nation.

As countries recognize the importance of prioritizing the needs of the labor market in the production and development of technicians and workers to positively advance economic and social conditions, the Thai Vocational Education Act of 2008 was enacted for vocational education management and vocational training in state schools, private education institutions and other related establishments in regard to the quality, performance, and achievement of vocational school staff and students in accordance with the National Economic and Social Development Plan and National Education Plan of the Office of Vocational Education Commission (Office of Vocational Education Commission, 2009). Leaders, or administrators, are very important to drive organizations toward desired achievement and the management of vocational institutions needs to be monitored continuously. Administrators have to possess the potential and capacity for appropriate leadership in order to achieve organizational goals. The ability to do so will foster faith among stakeholders and encourage confidence, which will in turn create a cooperative environment beneficial to change. As such, educational management is very important and administrators need to have the necessary knowledge and adaptive skills to develop their institutions to achieve and maintain necessary degrees of quality (Runcharoen, 2017).

2. Objective

The research aims to study management quality factors for vocational education institutions through review of literature and related research to determine factors for quality management leadership of vocational education institutions and to investigate the construct validity of a quality management measurement model for vocational education institutions that can act as a guideline for effective management of vocational education institutions.

3. Methodology

3.1 Population and Sample

The population consisted of directors and deputy directors of Thai vocational education institutions from the Institutes of Vocational Education in Central Regions 1 to 5, Institutes of Vocational Education in Southern Regions 1 to 3, Institutes of Vocational Education in the Eastern Region, Institutes of Vocational Education in Northeastern Regions 1 to 5, Institutes of Vocational Education in Northern Regions 1 to 4, Institute of Vocational Education in Bangkok, and Agricultural Vocational Training Institutes in the Central, Southern, North and Northeastern regions.

The sample group from the above population was determined using Multistage Random Sampling, with the sample size of 350 directors and deputy directors of vocational education institutions set following criteria established by Hair (Hair et al, 2010) in accordance with a factor

loading of 0.30 to make the model strong for hypothesis testing and consistent with empirical data.

3.2 Research Tool

The analysis tool used to gather data pertaining to quality management leadership factors for vocational education institutions was a questionnaire developed by the researcher according to conceptual frameworks determined from the review of literature and related research and given to the sample group. The questionnaire was separated into 2 parts, with the first part collecting general information pertaining to vocational education institution administrators through multiple choice-questions and the second part measuring the quality management of vocational education institutions using a Likert rating Scale (Likert, 1932).

The questionnaire had content validity appraised by experts using 46 questions covering 7 sets of factors in the areas of 1) Strategic Planning, 2) Process Management, 3) Leadership, 4) Personal Development, 5) Customer Focus, 6) Measurement and Evaluation, and 7) Results. The reliability of the observed variables for each question sets is good according to a formula (Cronbach, 1951). The reliability of the questionnaire is 0.98 and scores for each set can be shown as follows: Strategic Planning is 0.90, Process Management is 0.94, Leadership is 0.94, Personal Development is 0.94, Customer Focus is 0.88, Measurement and Evaluation is 0.92, and Results is 0.94.

3.3 Data Analysis

Preliminary analysis from sample data was done using frequency and percentage and analysis of the distribution of the data was done by mean and S.D. Variables were verified in relation to Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity to verify the appropriation of variables and their relations, which will be used to analyze the factors. If KMO is higher than 0.50, the data is appropriate for further analysis and Bartlett's test of sphericity must ensure sufficient correlation of variables to analyze the factors.

From the analysis, correlation coefficients (r) for all 46 observed variables are significantly higher than 0 at the level of 0.01 for every pair. Therefore, correlation coefficients are positively correlated with values ranging from 0.471 to 0.741. In addition, Bartlett's Test of Sphericity to verify the Identity Matrix found that Chi-Square= 15880.193, df= 1035, and p= 0.000, significantly differing from 0 at the level of 0.01. The Kaiser-Meyer-Olkin (KMO) is 0.983, which is close in value to 1 so the correlation matrix of observed variables is not a unique matrix and there is sufficient correlation to perform confirmatory factor analysis to verify the construct validity of the model.

Analysis of the construct validity of the quality management measurement model of vocational education institutions was done using the Second Order Confirmatory Factor Analysis (2nd Order CFA) with LISREL.

4. Results

From the analysis of the construct validity of the quality management measurement model of vocational education institutions by the Second Order Confirmatory Factor Analysis (2nd Order CFA), the model conforms to the empirical data as shown in Table 1.

Table 1: Criteria and theory of the study's Values of Goodness-of-Fit appraisal

Criteria Index	Criteria	Values	Results	Supporting Theory
1. χ^2 - Sig. (p)	> 0.05	0.082	passed	(Joreskog and Sorbom, 2012)
2. RMSEA	< 0.05	0.014	passed	(Schumacker & Lomax, 2010)
3. CFI	> 0.90	1.000	passed	(Schumacker & Lomax, 2010)
4. GFI	> 0.90	0.900	passed	(Hooper et al, 2008)
5. RMR	< 0.05	0.020	passed	(Schumacker & Lomax, 2010)

From Table 1, the results from the verification analysis of the quality management measurement model of vocational education institutions by the Second Order Confirmatory Factor Analysis (2nd Order CFA) show that the model conforms to the empirical data with Chi-Square= 915.32, df= 857, and p= 0.08167. In other words, χ^2 is not statistically different from 0 at the significant level of 0.05 and $\chi^2/df= 1.0680$, which is lower than 2. Furthermore, RMSEA= 0.014 and RMR= 0.012, which is less than 0.05. GFI= 0.900 and CFI= 1.00, which is higher than 0.90. Therefore, the quality management measurement model of vocational education institutions has construct validity.

The analysis of the construct validity of the quality management measurement model of vocational education institutions by The Second Order Confirmatory Factor Analysis (2nd Order CFA) to determine factor loading is shown in Table 2.

Table 2. Second Order Confirmatory Factor Analysis

Factors	Observed variables	factor loading				R ²
		bsc	S.E.	t	p	
1 st						
STR	A1	.67	<- ->	<- ->	<- ->	.60
	A2	.67	.04	16.63	.000	.66
	A3	.73	.04	17.43	.000	.70
	A4	.72	.04	16.52	.000	.65
	A5	.66	.04	16.18	.000	.62
	A6	.74	.05	16.05	.000	.71
	A7	.70	.04	16.28	.000	.63
PRO	B1	.64	<- ->	<- ->	<- ->	.62
	B2	.72	.04	17.92	.000	.70
	B3	.69	.04	17.50	.000	.69
	B4	.71	.04	17.22	.000	.67
	B5	.69	.05	15.36	.000	.61
	B6	.70	.04	16.74	.000	.64
LEA	C1	.67	<- ->	<- ->	<- ->	.62
	C2	.67	.04	16.60	.000	.63
	C3	.65	.04	17.36	.000	.60
	C4	.66	.04	16.90	.000	.64
	C5	.63	.04	16.01	.000	.59
	C6	.69	.04	16.85	.000	.64
	C7	.67	.04	15.66	.000	.65
	C8	.73	.04	16.52	.000	.71
	C9	.73	.04	17.27	.000	.66
PER	D1	.74	<- ->	<- ->	<- ->	.71
	D2	.74	.04	19.85	.000	.70
	D3	.74	.04	19.90	.000	.70
	D4	.72	.04	19.81	.000	.70
	D5	.71	.04	18.51	.000	.68
	D6	.72	.04	18.83	.000	.66
CUS	E1	.74	<- ->	<- ->	<- ->	.68
	E2	.78	.04	19.71	.000	.71
	E3	.71	.04	17.74	.000	.62
	E4	.70	.04	18.05	.000	.64
	E5	.69	.04	17.56	.000	.61
	E6	.64	.04	16.66	.000	.57
MEA	F1	.76	<- ->	<- ->	<- ->	.70
	F2	.74	.04	19.54	.000	.70
	F3	.71	.04	19.40	.000	.69
	F4	.81	.05	16.71	.000	.62
	F5	.68	.04	17.97	.000	.63
	F6	.71	.04	16.77	.000	.64
RES	G1	.70	<- ->	<- ->	<- ->	.65
	G2	.78	.05	17.18	.000	.71
	G3	.77	.04	19.07	.000	.73
	G4	.70	.04	18.23	.000	.69
	G5	.75	.04	18.70	.000	.71
	G6	.72	.04	17.69	.000	.66

Factors	Observed variables	factor loading				
		bsc	S.E.	t	p	R ²
2 nd	STR	.92	.06	15.77	.000	.84
	PRO	.92	.06	16.07	.000	.84
	LEA	.98	.06	17.11	.000	.96
	PER	.96	.05	18.50	.000	.93
	CUS	.99	.05	18.56	.000	.97
	MEA	.95	.05	18.20	.000	.91
	RES	.97	.06	17.56	.000	.95

Note: Chi-Square= 915.32, df= 857, p= .082, $\chi^2/df= 1.0680$, RMSEA= .014, RMR= .012, GFI= .900, CFI= 1.00
Remark: bsc is standard factor loading, R² is coefficient of determination, <- -> values are controlled parameters not shown in S.E., t, and p.

From Table 2, factor loading of every variable is positive and significantly different from 0 at the level of 0.05. The coefficient of determination (R²), which explains the covariance of the quality management measurement model of vocational education institutions, is 0.63 - 0.81. Each set of factors can be explained as follows;

The Strategic Planning Factor (STR) set, which consists of 7 observed variables, has a range of factor loading from 0.66 to 0.74 and the significant level of 0.05 for every variable. The variable with the highest factor loading is A6, which equals 0.74 and R²= 0.71.

The Process Management Factor (PRO) set, which consists of 6 observed variables, has a range of factor loading from 0.64 to 0.72 and the significant level of 0.05 for every variable. The variable with the highest factor loading is B2, which equals 0.72 and R²= 0.70.

The Leadership Factor (LEA) set, which consists of 9 observed variables, has a range of factor loading from 0.63 to 0.73 and the significant level of 0.05 for every variable. The variable with the highest factor loading is C8, which equals 0.73 and R²= 0.71.

The Personal Development Factor (PER) set, which consists of 6 observed variables, has a range of factor loading from 0.71 to 0.74 and the significant level of 0.05 for every variable. The variable with the highest factor loading is D1, which equals 0.74 and R²= 0.71.

The Customer Focus Factor (CUS) set, which consists of 6 observed variables, has a range of factor loading from 0.64 to 0.78 and the significant level of 0.05 for every variable. The variable with the highest factor loading is E2, which equals 0.74 and R²= 0.71.

The Measurement and Evaluation Factor (MEA) set, which consists of 6 observed variables, has a range of factor loading from 0.68 to 0.81 and the significant level of 0.05 for every variable. The variable with the highest factor loading is F4, which equals 0.81 and R²= 0.62.

The Result Factor (RES) set, which consists of 6 observed variables, has a range of factor loading from 0.70 to 0.78 and the significant level of 0.05 for every variable. The variable with the highest factor loading is G2, which equals 0.78 and R²= 0.71.

From the second order confirmatory factor analysis, the quality management measurement model of vocational education institutions, which consists of 7 factors, conforms to the empirical data. The most important factor is Customer Focus (CUS), with factor loading= 0.99 and R²= 0.97. The next is Leadership (LEA), with factor loading= 0.98 and R²= 0.96. The next is Result (RES), with factor loading= 0.97 and R²= 0.95, followed by Personal Development (PER), with factor loading= 0.96 and R²= 0.93 and Measurement and Evaluation (MEA), with factor loading= 0.95 and R²= 0.91. The last factors are Strategic Planning (STR), with factor loading= 0.92 and R²= 0.84 and Process Management (PRO), with factor loading= 0.92 and R²= 0.84 respectively.

5. Discussion

From the Second Order Confirmatory Factor Analysis, the quality management measurement model of vocational education institutions, which consists of 7 factors, conforms to the empirical data and the importance of each factor, sorted in importance from most to least, are as follows:

The Customer Focus (CUS) set, with factor loading= 0.99 and R²= 0.97, conforms to the concepts of the Thailand Productivity Institute (2004), which highlight customer focus and marketing as key factors affecting decision-making. This is reflected by awards organizations such as the

Thailand Quality Award (TQA), the Malcolm Baldrige National Quality Award (MBNQA), and the Singapore Quality Award (SQA). The Australian Business Excellence Awards also prioritize the customer focus.

For the Leadership (LEA) set, the leadership quality management measurement model of vocational education institutions conforms to the concept of Dubrin (1988), which identified that leaders who are able to make organizations flourish and achieve desired goals are those who have positive and meaningful relationships with subordinates, who create stability and who help others to achieve group targets. These may cause every factor loading to be positive and significantly different from 0 at the level of 0.05. R^2 , which explains the covariance of a leadership quality management measurement model of vocational education institutions, and has values that range from 0.58 - 0.71. These show that the leadership quality management measurement model of vocational education institutions' administrators conforms to the empirical data.

The Result (RES) set, with factor loading= 0.97 and $R^2= 0.95$, conforms with the award guidelines of the European Quality Award (EQA) (Kok et al, 2001), in which results are an important factor.

Personal Development (PER), with factor loading= 0.96 and $R^2= 0.93$, conforms to the award guidelines of the Singapore Quality Award (SQA) (Tan & Khoo, 2002) and the Australian Business Excellence Awards, which prioritize personal development (Australian Business Excellence Awards, 2000).

Measurement and Evaluation (MEA), with factor loading= 0.95 and $R^2= 0.91$, conforms to the award guidelines of the Malcolm Baldrige National Quality Award (MBNQA), which prioritizes measurement, analysis, and knowledge management as key factors (Giunta, 2015).

Strategic Planning (STR), with factor loading= 0.92 and $R^2= 0.84$, conforms to the award guidelines of the Singapore Quality Award (SQA) (Tan, K. C. and Khoo, 2002) and Australian Business Excellence Awards, which prioritize strategic planning for the quality of the organization (Australian Business Excellence Awards, 2000).

Process Management (PRO), with factor loading= 0.92 and $R^2= 0.84$, conforms to the award guidelines of the European Quality Award (EQA) (Kok et al, 2001) and Singapore Quality Award (SQA), which prioritize process management as a factor for organizational quality (Tan, K. C. and Khoo, 2002).

6. Conclusion & Recommendation

From the study, there are 7 main factors which affect management quality factors of vocational education institutions and 46 variables which can be used in the conceptual framework or theory for the study of management quality of vocational education institutions as derived from the review of literature and related research. These factors and variables are verified for construct validity by the Second Confirmatory Factor Analysis, with the construct validity being good.

For further development, the questions which were used to measure variables for the appropriation of the contexts for each institution's management should be reviewed and amended to apply to a wider range of institutions given that all questions used in this study were limited to the context of vocational education institutions.

Also, the study of management quality factors of vocational education institutions can be improved by applying Structural Equation Modeling (SEM) to ascertain factors from each set, which can be used to plan the development of vocational education to conform with future contexts.

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