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Instrument development for assessing knowledge management of quality assurers in Rajabhat universities, Thailand

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ABSTRACT

This research was conducted for the purpose of developing a valid and reliable instrument to evaluate knowledge management of quality assurance personnel in tertiary institutes. The literature review on knowledge management discovered that 15 items were used to classify 4 latent variables. From this literature review, a knowledge-management instrument was created. The content validity of the instrument was 0.70–1.00, and the internal consistency reliability of each latent variable was 0.82–0.89. The knowledge management instrument was used to collect data from 126 quality assurers in 40 Rajabhat universities using simple random sampling, with a response rate of 83.33 percent. The results of instrument quality analysis showed that the loading of total variables passed the criterion at 0.79–0.92 with an indicator reliability of 85 percent. Cronbach's alpha coefficient revealed each latent variable was valued at 0.784–0.904 with a reliability at 0.867–0.933, passing both convergent and discriminant validity tests. The analysis of the second order model showed a high level of prediction coefficient in 2 latent variables (knowledge dissemination and knowledge application), while the other 2 (knowledge conversion and knowledge acquisition) were at an average level. The total effect size of all variables, reflected via knowledge management elements, was significant at .01.

Introduction

To meet the global standard and to enhance competitive ability in the world market, the state and private sectors are expected to develop their administrative efficiency based on the Thailand Quality Award (TQA) criteria. The criteria used from 2010 to 2015 focused on knowledge management at both the individual and organizational levels, particularly Section 4, concerning measurement, analysis, and knowledge management. The main content emphasizes roles in selecting, collecting, analyzing, managing, and improving information for the administrative improvement of the organization (Thailand Quality Award Office, 2010, 2011, 2013). The latest criteria applied in 2014–2015 state that knowledge management requires a process of collecting and sharing knowledge of the individual and applying excellent practices in operating and developing the organization into a genuine learning organization. The operation of Section 4 is directly related to Section 5 (highlighting the workforce and leader development). Learning and development systems within the organization are needed in completing the requirements of the organization and the development of the individual.

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The Royal Decree on rules and procedures of good governance B.E. 2546, Code 11 states that the government sectors should function in regular knowledge development of the organizations by creating a system of information perception, processing knowledge for accurate application, encouraging and developing the knowledge and ability of the government officials to be up to date to maximize contributions and virtues in work performance, and to build up participant culture in knowledge sharing among government servants. Work performance, therefore, can be effectively developed under the systematic application of new public sector management administration.

In accordance with the National Education Act, B.E. 2542, the revised 2nd issue, B.E. 2545, and the ministerial regulations on systems, criteria, and educational quality assurance methods, B.E. 2533, Rajabhat universities developed a unit responsible for internal and external quality assurance (Office of the Higher Education Commission [OHEC], 2011). The knowledge management principle is widely employed for tracking the progress of quality assurance. There have also been networks established for sharing knowledge management ideas among institutes and faculties with the major purpose to effectively accomplish a quality assurance plan.

Objectives

1. To identify knowledge management factors and their indicators for quality assurance personnel in Rajabhat universities.
2. To affirm the quality of knowledge management factors and their indicators of quality assurance personnel in Rajabhat universities.

Literature Review

Many educators have defined the meanings of knowledge management in a variety of ways. Debowski (2006) stated that knowledge management was the process of specifying, selecting, systematizing, and publicizing intellectual knowledge, which would have a long-term impact on the operation of the organization. Wunram (2000) pointed out that systematic knowledge management aimed at the application of internal and external knowledge of the organization. The knowledge (either tacit or explicit) would lead to the construction of knowledge, value, innovation, and operational improvement. For Ichijo and Nonaka (2007), knowledge management was defined as creating and sharing knowledge assets. Similarly, Thai educators like Lorsuwanrat (2008) defined knowledge management as creating, assessing, publicizing, and applying knowledge for more effectiveness in operation. Vicheanpanya (2004) explained that knowledge management was the system of assessing data, information, ideas, performances, and personal experiences. Knowledge or innovation created was stored and easily accessed via different channels that the organization prepared for the application of the personnel. This encouraged knowledge sharing, transferring, and finally circulating existing knowledge within the organization in a balanced way for production and organizational development. The Office of the Public Sector Development Commission (2012) noted that knowledge management was a systematic process in obtaining, creating, exchanging, and applying data in developing the proficiency of the personnel and their working performance in order to achieve the objectives of the organization.

To summarize, knowledge management is a process of acquiring, assessing, disseminating, exchanging, and applying knowledge in working effectively. Supportive systems, therefore, should be provided in order to create a knowledge management atmosphere within the organization.

This research followed the conceptual framework of Jafari, Akhavan, and Nikookar (2013) and Cheong and Tsui (2011), who suggested two levels of a new trend in knowledge management—personal knowledge management and organizational knowledge management. Personal knowledge management is required as the first step of knowledge management as the organizational personnel are specialists and investors of intellectual capital that would be beneficial for the organization. However, previous studies focused on organizational knowledge management rather than its personal aspect. Frand and Hixon (1998) pointed out that personal knowledge management was a strategic process in knowledge accumulation of the organization. The knowledge applied in each job was selected and collected from different sources of information by the individual whose continual application affected the knowledge management of the organization. Personal knowledge management was, therefore, a branch of organizational knowledge management. Similarly, the concept of the application of information in knowledge management of Davenport (2007) suggested the importance of personnel as direct performers of activities. For that reason, the organization should motivate its personnel to apply internal and external information and knowledge in improving personal productivity. Cheong and Tsui (2011) added that personal knowledge management was crucial for the individual, the organization, and society, as it showed information management skill in the improvement of personal working proficiency which would be reflected in the achievements of the organization over the long term.

This study focused on four steps of personal knowledge management in quality assurance based on the classification of Thanyasunthornsakun (2011) and Úbeda-García (2012) as follows:

1) Knowledge acquisition—aiming at the pursuit of, or construction on, new knowledge related to job descriptions. In this step, knowledge arises with relationship, cooperation, and interpersonal communication among the personnel.

2) Knowledge conversion—being the process of documenting the latent knowledge of the individual or knowledge spread both in and out of the organization to be accessible and usable knowledge.

Table 1
Latents and their variables

Latent	Variable/Item
Knowledge acquisition	1. You knew of reliable sources publicizing quality assurance knowledge. (AP1)
	2. You regularly searched for information about quality assurance from different reliable sources. (AP2)
	3. You often consulted quality assurance specialists when having problems or questions about your jobs. (AP3)
	4. You usually searched for sources of quality assurance knowledge such as training programs. (AP4)
Knowledge conversion	5. You often compiled the knowledge from the quality assurance specialists to produce articles, newsletters, or blogs. (CP1)
	6. You always used your quality assurance experiences in composing articles, newsletter, or blogs. (CP2)
	7. You often suggested appropriate quality assurance methods to your colleagues. (CP3)
Knowledge dissemination	8. You always shared the experience of quality assurance with the personnel in your institutes. (DP1)
	9. You always shared the experience of quality assurance with the personnel in other institutes. (DP2)
	10. You often shared the knowledge gained from training, seminars, and conferences with your colleagues. (DP3)
	11. You often disseminated information about quality assurance that you created or collected within your institutes. (DP4)
Knowledge application	12. You always used the knowledge shared within the institutes or gained from the outside in developing working performance. (APLI1)
	13. You often employed the problem solutions derived from quality assurance performance in setting preventive measures for repetitive problems. (APLI2)
	14. You often used the best practice in quality assurance in creating working performance standards. (APLI3)
	15. You often raised the best practice in quality assurance as an example to the personnel in your institutes. (APLI4)

3) Knowledge dissemination—focusing on the process of disseminating or sharing knowledge both within and out of the organization by means of formal and informal activities such as holding meetings, emailing information, web board announcements, and knowledge sharing.

4) Knowledge application—being the process by which knowledge is applied for effective production. The process includes the evaluation of knowledge application in order to store necessary knowledge and eliminate unnecessary information.

Methods

A literature review on knowledge management was conducted and the development of an instrument was constructed. The instrument questions were adapted from Úbeda-García (2012), Ba (2004), Debowski (2006), Meireles, Cardoso, and Albuquerque (n.d.) and Thanyasunthornsakun (2011) and were assessed for content validity. The index of congruence of the test was 0.70–1.00. The tryout with the quality assurance personnel found Cronbach's alpha coefficient of each latent variable to be higher than 0.80, meeting the pass criterion (George & Mallery, 2009).

The developed instrument was used for data collection from quality assurance personnel in state tertiary institutes by mail. The population consisted of 132 quality assurance personnel in 40 Rajabhat universities in Thailand. Based on a sample estimate population of 99 percent of the population, 126 subjects were selected by simple random sampling (Teddlie & Tashakkori, 2009). From the 126 subjects, 105 questionnaires (83.33%) were returned to the researchers.

The data obtained were examined before the analysis of instrument quality.

Missing data were discovered in 10 observed variables. The lowest missing data value was 1 respondent or 0.95 percent, while 2 respondents or 1.90 percent presented the highest missing data. The mean of nearby points, therefore, was utilized in data imputation estimation. The outlier examination of the samples by measuring the Mahalanobis distance found no outliers. Partial Least Square Structural Equation Modeling and SmartPLS 2.0 program were used in the analysis of instrument quality (Ringle, Wende, & Will, 2005). Related values were evaluated using the criteria of Hair, Hult, Ringle, and Sarstedt (2014), which included 1) indicator reliability assessed from indicator loadings should be above 0.70 since that number squared equals 0.50 (50%) with a significant level of .05; 2) Composite Reliability (CR) should be above 0.80; 3) convergent validity evaluated from the average variance extracted (AVE) of at least 0.50, and 4) discriminant validity demonstrated that the latent variable was unique and captured phenomena not represented by other latent variables in the model, Fornell–Larcker criterion analysis or the comparison of the square root of AVE and R^2 between latent variables was carried out (Fornell & Larcker, 1981).

Results

Respondent Characteristics

Nearly three-fourths of respondents were females (73.3%), and educational level consisted of Bachelor (51.4%) and Master (42.9%) degrees. The average age of the respondents was 34 yrs and they had an average of 5 years of work experience in quality assurance.

Knowledge Management in Quality Assurance

The knowledge-management instrument was developed and met all criteria being composed of four latent and 15 variables as shown in Table 1.

Quality of measurement model: The analysis showed that variable quality met the criterion with an indicator loading of over 0.70. Table 2 illustrates the loadings between 0.797 and 0.920 and the highest and lowest ability in phenomenon explanation were 84.60 and 63.50, respectively. Cronbach's alpha coefficient of each latent variable

Table 2
Variable loading, variable reliability, statistical significance, Cronbach's alpha coefficient, latent variable reliability, and convergent validity

Latent variable	Variable	Loading	Reliability	t	*p*	α	CR	AVE
Acquisition Process (AP)	AP1	0.820	0.672	20.951	.001	0.853	0.900	0.693
	AP2	0.867	0.752	30.230	.001			
	AP3	0.845	0.714	32.660	.001			
	AP4	0.797	0.635	18.654	.001			
Conversion Process (CP)	CP1	0.801	0.642	11.576	.001	0.784	0.867	0.686
	CP2	0.851	0.724	13.104	.001			
	CP3	0.831	0.691	31.746	.001			
Dissemination Process (DP)	DP1	0.887	0.787	34.938	.001	0.904	0.933	0.777
	DP2	0.816	0.666	19.691	.001			
	DP3	0.900	0.810	50.626	.001			
	DP4	0.920	0.846	55.403	.001			
Application Process: (APLI)	APLI1	0.864	0.746	37.464	.001	0.897	0.929	0.765
	APLI2	0.913	0.834	42.851	.001			
	APLI3	0.901	0.812	36.422	.001			
	APLI4	0.818	0.669	17.138	.001			

was 0.784–0.904. The reliability of latent variables was 0.867–0.933, passing the criterion at 0.80; the convergent validity was 0.686–0.777. This showed that the variable in each latent variable was well related and clearly explained its own latent variable.

Table 3 shows that the convergent validity in every latent variable was higher than the correlation with other latent variables. For example, the square root of AVE in the latent variable of knowledge conversion equaled 0.828 and was higher than the correlation of other variables with correlations at 0.415–0.748. The model, therefore, had discriminant validity.

A reflective–reflective model was placed at the second order. The prediction coefficient was ranked as: >0.75 indicating a high level of prediction power; >0.50 a moderate level; and >0.25 a low level (Hair et al., 2014). The analysis results in Table 4 and Figure 1 illustrate the highest level of prediction coefficient in two latent variables (knowledge dissemination and application) with coefficients of 0.826 (82.60%) and 0.805 (80.50%), respectively, while the prediction coefficients of the other two latent variables were at an average level. The consideration of overall loading of the latent variables reflected via the elements of knowledge management discovered that all latent variables were significant at .01. The dissemination process had the highest loading (0.909), while the lowest loading was found in the acquisition process (0.747).

Discussion and Conclusion

The development of the instrument to evaluate personal knowledge management in this research was classified into four processes and reflected in a series of 15 questions in accordance with the literature review. During the process, the information available, both nationally and internationally, was researched for instrument development. The developed instrument was evaluated by specialists for validity and tested for reliability before being used with the sampling subjects. The discovery that the first and the second order models passed the criterion reflected the reliability and validity of the instrument and confirmed that it could be applied to evaluate individual knowledge management of the quality assurance personnel in this research. The findings were a result of the correlation between the questions or developed variables and the knowledge management concept which focused on knowledge acquisition, assessment, dissemination, exchange, and application of the personnel in developing themselves for effective working performance (Cheong & Tsui, 2011). The findings in this research, however, differed from those of Parkart (2014), who discovered that the National Institute of Development Administration employed knowledge management in five aspects of educational quality assurance: 1) knowledge identification, 2) knowledge creation and acquisition, 3) knowledge storage and access, 4) knowledge sharing, and 5) knowledge application.

Table 3
Square root of convergent validity and latent variable correlation

Latent variable	AP	APLI	CP	DP
AP	**0.832**			
APLI	0.558	**0.875**		
CP	0.415	0.633	**0.828**	
DP	0.560	0.748	0.672	**0.881**

The bold values indicate that the square root of convergent validity is higher than the latent variable correlation

Table 4
Prediction coefficient, total effect and significance level of latent variables

Latent variable	R^2	Total effect	t	*p*
Acquisition	0.558	0.747	12.630	.001
Conversion	0.608	0.780	28.684	.001
Dissemination	0.826	0.909	59.877	.001
Application	0.805	0.897	45.983	.001

Recommendation

Rajabhat universities and other tertiary institutes can apply this instrument in evaluating the personal knowledge management of their quality assurance personnel. Based on the evaluation results, personnel development plans can be set accordingly for greater strength and less weakness. The information can also be used as a basis for

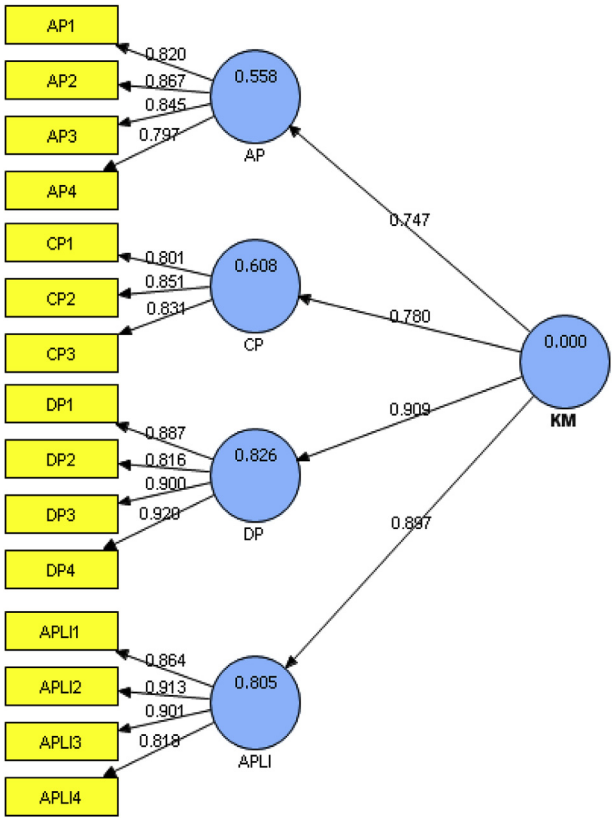

Figure 1 Measurement models 1st and 2nd level of knowledge management elements

knowledge management of working groups and organizations. Quality assurance personnel in Rajabhat universities can also employ the instrument in appropriate self-development programs for personal knowledge management principles.

Conflict of Interest

There is no conflict of interest.

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