

Evaluation Research on the Implementation of Talent Quality Management System in Medical Institutions

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Abstract

This study focuses on exploring performance evaluations before and after medical institutions in central Taiwan import and promotes a Talent Quality-Management System (TTQS). We implement the design of this study in two stages. The first stage is based on “Talent Quality-Management System Imported to Performance Evaluations and New Indicators Plan” carried out by the Research and Development Institute of Vocational Training and authorized by Taiwan’s Workforce Development Agency, aiming to adjust and modify the questionnaire of “TTQS Imported to Performance Evaluations” presented in the planning report so as to better meet the industrial pattern of medical institutions. Through the results of the quantitative analysis conducted in the first stage, important questionnaire items are drafted based on five dimensions of PDDRP (Plan, Design, Do, Review, and Outcome) of TTQS to conduct in-depth interviews in the second stage.

Based on the results of quantitative analysis, the second stage executes qualitative analysis to conduct research by means of in-depth interviews. Sorting and exploring the information obtained from the interviews reveal that if the establishment of an organization is equipped with a complete training process and system, then organizational staff people can achieve their targeted accomplishments following training, and all departments can better communicate with one another in order to come to an agreement, thus helping the organization enhance its operations. This study finds for medical institutions importing it that TTQS provides them, management-wise, with sound systems of internal and external training, which allows the departments to communicate smoothly and reach a consensus. The results of this study not only can help medical institutions to substantially promote their manpower performance, but also can allow related appraisal units to refer to the TTQS plan when offering different counseling projects for various industries based on their needs, in order to successfully spur industrial talent cultivation.

Keywords: medical institutions, Talent Quality-management System, performance evaluations, in-depth interviews

JEL Classifications: M12

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1. Introduction

The Executive Yuan established a quality verification system for the talents training industry in respect of the “measures of developing talents training service industry”, under which the Workforce Development Agency is charged with planning on the introduction of international specifications for training quality and presenting viable strategic programs. According to a number of documents, Talent Quality-management System, TTQS, has exhibited significant effectiveness in small- and medium-scale conventional industries, semiconductor industry, textile industry, hotel industry, and financial industry, the military, hospitals and trade unions. (Wan, 2004; Wang and Chao, 2009; Bai and Kung, 2010; Lin et al., 2010; Lee, 2011; Lin et al., 2011; Wang et al., 2012; Bai and Chen, 2013; Li et al., 2013; Han, 2014; Fangtsou et al., 2014; Lian et al., 2014; Jou et al., 2015; Huang et al., 2017).

This study explores the differences in and performance by medical institutions in central Taiwan before and after they introduced TTQS, and whether it really helped them in increasing their operational goals and personal training after the introduction. This study is hoped to enable, through the results of analysis of variance and questionnaire analysis as well as in-depth interviews provided herein, the medical institutions who have carried out or intend to introduce TTQS to make planning assessment of how to effectively execute TTQS in the items of assessed indicators and in turn to increase overall human resources competitiveness of the medical practice.

In the research method section, the design of this study was implemented in two phases. The first phase is based on the "Quality Management System for Introducing Performance Evaluation and New Indicators Program" implemented by the Vocational Training Research and Development Institute authorized by the Labor Development Bureau, and aims to adjust and modify the "TTQS introduced in the planning report" "Import performance evaluation" to better meet the industry structure of medical institutions.

Therefore, the results of this research can not only help medical institutions to greatly improve their human performance, but also allow relevant evaluation units to refer to the TTQS plan and provide different consulting projects for various industries according to their needs, in order to successfully provide them with industrial talents to cultivate. The objectives of this study are:

- (1) To investigate the effectiveness of organizational training by medical institutions after they introduced TTQS;
- (2) To investigate how process indicators and outcome indicators mutually affect;
- (3) To understand, by means of in-depth interview, the effectiveness of introduction and implementation of TTQS by medical institutions in central Taiwan.

2. Materials

2.1. Medical Institutions

Medical industry, in a broad sense, refers to any medical institution like an institution in relation to mental and physical health, a hospital or clinic, or clinical lab, and its personnel. Medical service industry is defined, in a narrow sense, as the trade of medical practice under license from competent authorities. This study will limit the scope of exploration to the latter. In general, medical institutions mostly operate on Healthcare Information System, HIS, which emphasizes on daily operations without covering anything in human resources management or training for medical personnel (Tsai, 2008). The medical service industry provides patients with intangible services and tangible care, drugs or treatments, where the patients who are better satisfied have higher loyalty and the institution enjoys growth of business from constant increasing loyal customers and elevates its competitiveness.

In addition, in a country with higher national income, the higher is the average healthcare expense per capita. In Taiwan where the tendency is that the national income keeps increasing and the demographic structure is becoming older, the need for national healthcare grows rapidly; however, there are huge rooms of growth for medical institutions (Yeh 2009). Hence if an organization is set up with sound training processes and system, makes it possible for its personnel to achieve effectiveness through training, and allows the departments to communicate with one another smoothly to arrive at consensus, then the organization will operate more perfectly.

2.2. Talent Quality-management System, TTQS

Human Resource Development (HRD) emerged in 1980s, which mainly focuses on the management strategies and activities for enhancing organizational human resource quality. HRD puts more emphasis on individual development, individual inner cooperation with the organizational outer development, whereas TTQS is a system of HRD training management as well as a structure of education and training which integrates international human resource development with enterprise upgrading, aiming to cultivate national human capital and increase human resource competitiveness.

The Executive Yuan established a quality verification system for the talents training industry in respect of the “measures of developing talents training service industry”, under which the Workforce Development Agency is charged with planning on the introduction of international specifications for training quality and presenting viable strategic programs. The Vocational Training Bureau began in 2005 to promote specifications for training quality, in which it took into account ISO10015, European policies of vocational training, British Investors in People program (IIP), and Australian active vocational training policy. The Bureau also assesses ten benchmarking human power training institutions in Taiwan, finding the current difference of the enterprises and institutions, before it finally formulated Taiwan’s

own Taiwan Train Quality System, TTQS, as references in set-up of policies and programs of training quality specifications for Taiwan's businesses and training institutions (Chou, 2007).

Table 1: TTQS' Constructs of PDDRO

	Construct	Description
Training quality system	Plan	Specificity, continuity, systematization, capability
	Design	<ol style="list-style-type: none"> 1. systematic design of training programs 2. stakeholders' involvement in the process 3. orientation of demand for training 4. specified purchase process of training products and services
	Do	<ol style="list-style-type: none"> 1. how exactly the contents of training are executed 2. how systematically (much by information) the training is recorded and managed
	Review	<ol style="list-style-type: none"> 1. carry out assessments and integrated analysis on regular basis 2. monitor throughout the process and deal with anomalies
	Outcome	<ol style="list-style-type: none"> 1. levels (diversified) and completeness of training result assessments 2. general functions of the training system (diverse feedback, enabling continued improvement on the training)

Source: Courtesy of Lin *et al.* (2009)

TTQS involves five stages, which are Plan, Design, Do, Review and Outcome, short for PDDRO. These constructs make up the evaluation framework of TTQS, linking one another and executing endlessly one after another into a cyclic system. TTQS processes have a principle that makes it a point that every training organization must have appropriate, sound pattern of plan when making any vocational training plan (P), have executive process and contents that observe predefined systematic design (D), do (D) thoroughly, employ quantitative data during the process for review (R), and assess the final outcome (O) in a diversified and complete manner to serve as reference for a next stage of training in improvement and making basic value of sound pattern of plan Lin (2006). The points of focus of each of TTQS' construct are outlined as Table 1 shows.

2.3. In-depth Interview

Interviews are conversations between two or more persons, of whom at least one is interviewer(s) and one or more interviewee(s). Interviews are a tool of gathering information, where with appropriate control and arrangement, the interviewer can inquire into the thoughts of the other person(s) to obtain desired answers (Wan, 2004). Dialogues between researchers and interviewees allow constructing interpretation on issues. In-depth interviews emphasize on discovering rather than assessing facts; they are suitable for exploratory research and can probe the inner of interviewees to understand their psychological activities and conceptualization, where as the repetition of the interview's reply increases, the profile of facts becomes clearer (Hsieh, 2009).

Additionally, in-depth interviews feature the understanding of interviewees' subjective

thinking, experience and feeling, and are an open, democratic, reciprocally interactive way of dialogue, by which the researchers continuously exchange, face-to-face, with the interviewees to understand their subjective views and inner feelings, in order to predict the key variables of personal behaviors, present and future (Fan, 1994). A number of researchers (Lin, 1998; Yeh, 2011; Yu, 1996) stated that experts selected as interviewees in “in-depth interview” should actually be engaged in the teaching and research that are relevant to the subjects of the research.

3. Methods

This study explores the “assessment of performance of TTQS imported by Medical Institutions in Central Taiwan”, whereby to extend to the effects on medical institutions after they imported TTQS. The processes and steps of the methods hereof are elaborated below.

3.1. Choice and Usage of Research Methods

This study is designed with a two-stage execution. The first stage is quantitative analysis, which uses the results of sorting questionnaires retrieved as the basis of analyses herein for validity and Anova analyses, to examine the effectiveness of performance evaluation indicators, so as to understand the difficulties facing and solutions for the medical institutions during their introduction of TTQS. The second stage involves qualitative analyses, where in-depth interviews are conducted to persons of various levels at the medical institutions to understand the effectiveness to the organizations and their personnel before and after their import of TTQS.

3.2. Questionnaire Reliability Analysis

Reliability of the questionnaires herein is reviewed in order to ensure this measuring tool is capable of measuring the contents of measurement that the researchers really want, for the purpose of stability and consistence of the scale, as Table 2 shows.

3.3. Subject of Research

The subjects of research herein are those medical institutions who import TTQS. it mainly emphasizes sequentially planning management strategies for business operation, connecting to the plan (P) of education and training, and making the curriculum design (D) based on this plan, including the important resources which can affect education and training, such as interested parties, course contents, places, contracts, and so on. Do (D) the concrete project of this design and evaluate the performance of education and training by means of behavior changes and growth of achievements. Therefore, in the aspect of performance evaluation, this study adopts the two-phase method to have a discussion. In the first phase, questionnaires are given to the organizational TTQS in-charge staff and department heads, the organizational self-evaluations introduce benefits, and then the questionnaires are collected to

conduct a statistical analysis. In the second phase, the subjects for interviews mainly focus on top-level and middle-level supervisors, and a list of interviews is made for in-depth interviews.

Table 2: Scope of Reference of Reliability Coefficient

Reliability coefficient	Credibility
reliability \leq 0.30	Not reliable
$0.30 <$ reliability \leq 0.40	Barely reliable, being preliminary study
$0.40 <$ reliability \leq 0.50	Slightly reliable
$0.50 <$ reliability \leq 0.70	Reliable (most common range of reliability)
$0.70 <$ reliability \leq 0.90	Very reliable (second common range of reliability)
$0.90 <$ reliability	Highly reliable

Source: Courtesy of Lee (2009); Villa *et al.* (2009); Aydin *et al.* (2016); Veiga (2016).

3.4. Data Gathering and Analysis

3.4.1. Descriptive Statistical Analysis

This study conducts descriptive statistics on the information contained in 41 copies of distributed questionnaire, to understand the distribution of the basic information on the organizations being interviewed.

3.4.2. One-way ANOVA

When the distribution of the data herein has undergone descriptive statistical analysis, the one-way ANOVA is further employed to examine the following questions:

- (1) Would the effectiveness of introduction vary by involved department?
- (2) Would the effectiveness of introduction vary by the type of position?
- (3) Would the results differ as a result of different purposes among the applying enterprises?

3.4.3. Pearson's Correlation Analysis

This study uses "Pearson's (correlation analysis)" to examine the correlations between 16 process indicators and six outcome indicators to find out whether correlations exist between the factors.

3.4.4. Process Indicators and Outcome Indicators

Sort the process indicators that correspond to the constructs of PDDRO, and the outcome indicators, as Tables 3 and 4 below show.

Table 3: Aspect of Process Indicators

Construct	Mapping outcome indicator	Factor and item
Plan	A1-1	The import of TTQS helps in elevating corporate image
	A3-1	The import of TTQS helps establishing complete training management system
	A5-1	The import of TTQS helps in combining human resources system and corporate operational goals
	A2-1	The import of TTQS helps in setting specific core training categories
	A3-2	The import of TTQS helps the value of establishing training quality management system
	A3-3	The import of TTQS helps in establishing relevant managing rules, procedures and manuals
	A3-4	The import of TTQS helps training organization increase its ability of training administrative management
Design	A5-2	The import of TTQS helps in the standard of selection and specification for training products or services
	A6-1	The import of TTQS helps establishing the process of stakeholder participation
Do	A2-2	The import of TTQS helps increasing accuracy of selection of learners
	A4-1	The import of TTQS helps in appropriateness of selection of teaching materials
	A4-2	The import of TTQS helps in selection of teachers
	A4-3	The import of TTQS helps in selection of teaching methods
	A5-3	The import of TTQS helps in thorough performance of tasks and recording in training management
	A2-3	The import of TTQS helps in sorting and filing of training data
Review	A6-2	The import of TTQS helps in the awareness of monitoring over training process
	A6-3	The import of TTQS helps in the awareness of correction of errors during training process
Outcomes	A1-2	The import of TTQS helps in the awareness of effectiveness of assessment of training results

Table 4: Aspect of Outcome Indicators

Item
A1. Helps increasing corporate image
A2. Helps increasing employees' learning and growth
A3. Helps increasing organizations' operational performance
A4. Helps increasing investment in training for employees
A5. Helps in achieving corporate operational goals
A6. Increases stakeholders' participation in training

3.5. In-depth Interview

From the data gathered in literature review and those of statistical analysis of the questionnaire to the effectiveness assessment of TTQS introduction, the guidance and questions of interviews are drawn. The in-depth interview is conducted in the following steps:

Step 1. Set out guidance for interview

The guidance is designed based on the topic hereof, for the purpose of “validating” the quantitative results of statistical analysis of the questionnaire to effectiveness assessment of TTQS introduction. The contents are conceptualized focusing on the questions in the interview about the constructs, PDDRO, of TTQS, along with the comprehensive discussion over the issues on the “effectiveness assessment of TTQS” to be conducted subsequently. It is hoped to be able to combine and probe into the perspectives about the proposed constructs in the “questionnaire to effectiveness assessment of TTQS introduction”, to achieve the effect in terms of both “quantity and quality”. The items of interview designed herein are listed below.

- (1) What is the purpose of your application for TTQS?
- (2) Do you think whether the import of TTQS will help increasing the image of your institution? How to also let the coworkers understand the corporate operational goals and its core values?
- (3) Do you think whether it helps in the increase of the employees' learning and growth after the import of TTQS? How the enterprise can provide incentives to increase growth and learning?
- (4) Do you think whether the import of TTQS will help increase organizational operational performance? How will it help improving existed internal processes and increasing managerial efficacy (e.g., setting out management rules and procedures)?
- (5) How do you think to increase the investment in training for employees after the import of TTQS? (e.g., increase hard- and software, increase training fees, nurture coaches, or have employees trained outside--give specific statements.)
- (6) Do you think whether TTQS can help your institution in planning on long- and short-term education and training courses and goals? How to let the supervisors clearly know the effectiveness of education and training?
- (7) How do you think the import of TTQS achieve the operational goals of your institution?

(Give specific data or explain the achievement of the goals.)

- (8) How do you think to let senior and middle-level supervisors know the company's allocation of human resources, and the questions of empowering able persons to reduce fluctuation of human power after the import of TTQS and stakeholders increase their participation in the training?
- (9) Which of your institution's operations do you think that receives most benefit from improvement by TTQS? (e.g., finance, management, manufacturing process)

Step 2. Interview subjects

The subjects of interview herein are the specialists and supervisors who made happen and perform TTQS at the institutions, whose abundant viewpoints are hoped to make the findings hereof more complete and allow deeper insight into the relevant issues.

Step 3. Data process and analysis

In the interviews with open questions, sound was recorded to enable data gathering; the gathered data were then analyzed by "qualitative method". A qualitative analysis comprises data sorting, data analysis and integration and summarization.

4. Results Analysis

4.1. Reliability Analysis

For reliability analysis, the SPSS software of statistics was used to analyze the 41 valid copies of questionnaire. Table 2 reveals that the reliability coefficient is as high as 0.70, a reliable level. The Cronbach's alpha (α) for the two aspects were both above 0.8, at 0.944 for the "aspect of process indicators" and 0.920 for the "aspect of outcome indicators". Such result clearly demonstrated the high reliability of the survey questionnaire herein.

Table 5: Basic Information on Interviewees

	Number of persons	Percentage
Department		
Sales dept.	5	12.2%
administrative management dept.	21	51.2%*
Human resources dept.	8	19.5%
others	7	17.1%
Position		
Senior supervisors	7	17.1%
Middle-level supervisors	9	22.0%
Basic-level personnel	24	58.5%*
others	1	2.4%

4.2. Descriptive Statistics

Table 5 shows the basic information on the respondents, where the administrative management department and the position of basic level are predominant, accounting for

51.2% and 58.5%, respectively

4.3. One-way ANOVA

4.3.1. Departmental ANOVA

A comparison of the scores on the questionnaire contents by department revealed differences between groups in the “increase in investment in training for employees”. That suggests the effectiveness of TTQS introduction has different effects on the increase in investment in training for employees among different departments.

4.3.2. Position-wise ANOVA

Table 6 shows the comparison of the scores on the questionnaire contents by position. Items 2, 3 and 6 are seen with inter-group differences, suggesting that the effectiveness of TTQS introduction has different effects on helping increase of employee learning and growth, helping increase in organizational operational performance, and increasing stakeholders’ participation in training among different positions.

Table 6: Summary of ANOVA by Position

Item	p
1. Helps increase of corporate image	0.104
2. Helps increase employee learning and growth	0.029*
3. Helps increasing organizational operative performance	0.022*
4. Increase of investment in training for employees	0.201
5. Helps in achieving corporate operational goals	0.284
6. Increase stakeholders’ participation in training	0.026*

Notes: * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$

4.3.3. ANOVA of Different Grades in 2011 TTQS Evaluation

Table 7 shows the comparison of different grades in the scores on questionnaire contents in 2011 TTQS evaluation, which results reveal no inter-group differences, suggesting that the effectiveness of TTQS introduction has not different effect due to different grades in evaluation.

Table 7: Summary of ANOVA on Different Grades in 2011 TTQS Evaluation

Item	p
1. Helps increasing corporate image	0.146
2. Helps increase employee learning and growth	0.753
3. Helps increasing organizational operative performance	0.532
4. Increase of investment in training for employees	0.199
5. Helps in achieving corporate operational goals	0.477
6. Increase stakeholders’ participation in training	0.120

Note: * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$

4.4. In-depth Interview

The questionnaire herein has the contents that are based on TTQS review indicators;

investigation and interview were made in the order of “P, D, D, R and O”. As such, the TTQS review table was intended as key issues in the interview with the subjects of the in-depth interview herein that were the medical institutions who imported TTQS. The process of interview was hoped to allow probing deeper into the institutions’ view and questions regarding the introduction of TTQS. The coded and sorted data from interviews are given below.

Table 8: Structure of Coded Data from In-depth Interview

Stage	Code	Secondary code	Secondary coded item	Preliminary code	Preliminary coded item
Plan	1	1-01	Disclosure of organizational vision/mission/strategies	1-01-01	To increase corporate image and specialization
		1-02	Setup of goals and needs	1-02-01	Operational goal of next year, which can serve as training target for the departments
		1-03	Specific training policy	1-03-01	More sound education and training system in the company
Design	2	2-01	To increase investment in training for employees	2-01-01	The expenses of education and training courses can be for the company’s account
				2-01-02	To increase expenses of education and training courses
				2-01-03	To nurture seed trainers
		2-02	Combination of training and target needs	2-02-01	Education and training increase overall employees’ quality and corporate image
				2-02-02	To train employees in taking initiative in learning and growth
		2-03	Stakeholders’ participation in the process	2-03-01	Participation by senior and middle-level supervisors
				2-03-02	Supports from senior supervisors
Do	3	3-01	Assessment of training results	3-01-01	The employees have higher working efficiency
				3-01-02	The employees returning from external training should give reports
		3-02	Working environment for transfer of learning results	3-02-01	The import of TTQS helps employees in increasing learning and growth
Review	4	4-01	Assessment report and periodical summarized analysis	4-01-01	Able to decrease the problem of human power mobility and save personnel cost
				4-02-01	To review training results and do evaluations on regular basis
		4-02	Monitoring and handling	4-02-02	To monitor and handle issues during processes
Outcome	5	5-01	Organizational spreading effect of training	5-01-01	The import of TTQS did help increase operational performance
		5-02	Diversification and completeness of assessment of training results	5-02-01	Improvement on management and manufacturing processes
				5-02-02	To develop diversified means of training

4.4.1. Sorting and Coding the Questionnaire Data

Table 8 shows the overall qualitative contents, in notions, of the interview questionnaire that was administered to six interviewees for in-depth interview, sorted and coded, and then,

with the center of the topic hereof, corresponding to and validated by the quantitative constructs of level analysis into secondary and preliminary coded items.

4.4.2. Data of Interview—Scope of Plan

Table 8 shows the results of interview, where in the scope of “Plan”, the coded and sorted data of interview results are divided in the notions of “Disclosure of organizational vision/mission/strategies”, “Setup of goals and needs”, and “Specific training policy”.

“Disclosure of organizational vision/mission/strategies” can conceptually be comprised of the basic items, namely, “To increase corporate image and specialization”, and “Operational goal of next year, which can serve as training target for the departments”, of which

- (1) Regarding the item “To increase corporate image and specialization”, many interviewees unanimously considered that the import of TTQS helped increasing corporate total image and visibility, while allowed the coworkers to know the company’s intended establishment of specialization and direction for operation, as well as let the general consumers understand the company’s products and helped in expanding market shares.
- (2) The notion “Operational goal of next year, which can serve as training target for the departments” originates from the ISO10015 Education and training quality system; to have real training performance in human resources and to effectively foster excellent talents, the interviewees all considered it necessary to let the departments clearly know the future operational goal of the company and to have the departments set out their own executive goals, which should also be evaluated.

In addition, regarding “More sound education and training system in the company”, most of the interviewees stated that the companies had not been provided with a sound education and training system or had not preserved complete training process until TTQS was imported, which led to poor and varied quality of members and lacking or insufficient hard- and software equipment for training, because more equipment can be acquired by using government subsidies; moreover, there was high awareness of selection of teacher’s quality and teaching materials and the creation of complete education and training systems.

4.4.3. Data of Interview—Scope of Design

Table 8 reveals the results of interview, where in the scope of “Design”, the coded and sorted data of interview results are divided in the notions of “To increase investment in training for employees”, “Combination of training and target needs” and “Stakeholders’ participation in the process”.

- (1) The notion “To increase investment in training for employees” can comprise of the basic items of “The expenses of education and training courses can be for the company’s account: “To increase expenses of education and training courses” and “To nurture seed

trainers”. The first two of these notions are understood from the company’s purpose of application for TTQS, that because enterprises recognize employees as one of the key factors to successful business operation, they are willing to increase expenses on training. Furthermore, in respect of “To nurture seed trainers”, the interviewed companies have their senior and middle-level supervisors or able employees educated outside the company in order to foster seed trainers for giving internal education and training.

- (2) “Combination of training and target needs” can conceptually comprise of the basic items of “Education and training increase overall employees’ quality and corporate image” and “To train employees in taking initiative in learning and growth”. The former item should couple with the preceding stage “Plan” and be designed in line with the goals and needs of plan at Stage one. Moreover, the latter notion has an ultimate goal of hoping to see employees learn and grow out of their own will through the activities of education and training.
- (3) “Stakeholders’ participation in the process” can conceptually comprise of the basic items of “Participation by senior and middle-level supervisors” and “Supports from senior supervisors”. In the former, senior supervisors can join in the making of education and training strategies and be involved in the training process. In addition, for the latter, if supports from senior supervisors are available in the scope of “Design”, it can significantly increase the executive effects of the project.

4.4.4. Data of Interview—Scope of Do

As Table 8 shows, in the scope of “Do” of the interview results, the coded and sorted data of interview results are divided in the notions of “Assessment of training results” and “Working environment for transfer of learning results”.

- (1) “Assessment of training results” can conceptually comprise of the basic items of “The employees have higher working efficiency” and “The employees returning from external training should give reports”. Regarding the former, the most obvious training results the interviewed corporations received after the import of TTQS were higher working efficiency of the employees, and, next to it, the improved manufacturing processes in favor of product delivery. The latter notion is to understand the effectiveness of the training that employees received outside the corporation, while to be able to share the training results and to take them into the employee evaluations.
- (2) “Working environment for transfer of learning results” can conceptually comprise of the basic item of “the import of TTQS helps in increasing employee learning and growth”. Most interviewed corporations are positive about the import of TTQS helping in increasing employee learning and growth, and believe that increase of investment in education and training for employees helps enhancing corporate business performance.

4.4.5. Data of Interview—Scope of Review

As Table 8 shows of the interview results, in the scope of “Review”, the coded and sorted data of interview results are divided in the notions of “Assessment report and periodical summarized analysis” and “Monitoring and handling”.

- (1) “Assessment report and periodical summarized analysis” can conceptually comprise of the basic item of “Able to decrease the problem of human power mobility and save personnel cost”. Periodical assessment of human resources inside the corporation helps selecting, empowering and promoting the able. Also, assessment of the current needs by the departments for human power can save unnecessary personnel costs and avoid idle human power.
- (2) “Monitoring and handling” can conceptually comprise of the basic items of “To review training results and do evaluations on regular basis” and “To monitor and handle issues during processes”. The former being the core concept of monitoring and handling, can provide the assessment results for evaluation in the training results by stakeholders instead of evaluation after the whole education and training is completed. Furthermore, the latter is to monitor the process of project execution at all times, during which modifications and corrections are constantly made to avoid the training project from becoming finally inexecutable or poor results.

4.4.6. Data of Interview—Scope of Outcome

As Table 8 shows of the interview results, in the scope of “Outcome”, the coded and sorted data of interview results are divided in the notions of “Organizational spreading effect of training” and “Diversification and completeness of assessment of training results”.

- (1) “Organizational spreading effect of training” conceptually takes “The import of TTQS did help increase operational performance” as a sub-notion of result. Besides helping enterprises training and nurturing talents, TTQS also helps them increase corporate image and make their management system sound to fulfill their business goals.
- (2) The notion “Diversification and completeness of assessment of training results” can conceptually comprise of “Improvement on management and manufacturing processes” and “To develop diversified means of training”. In the former, the result assessments of such training allow the stakeholders of the project to know the effectiveness of the implementation and take it as basis for reference in a next plan to draw up training courses that meet corporate business goals and personal needs. Most of the interviewees believe that the benefits after the import of TTQS are most significant in the area of management and manufacture.

In addition, the latter is of the hope that enterprises are able to develop diversified training management. The interviewed companies herein have implemented their internal platform for education and training, on which the employees can search all the training courses and

data without being subject to time and spatial limits, so that they can learn freely without affecting their working progress.

5. Conclusions

This study found in the medical institutions who imported TTQS, it allowed them, management-wise, to be provided with sound systems of internal and external training, which allows the departments to communicate smoothly and reach consensus. And, in respect of capacity gap, that allows them to give training in the areas with greater gap, where when improvement has been complete internally, external reviews are employed to further reinforce insufficiencies. With internal and external improvements complementing each other, the systems are made more sound, which in turn upgrades the corporate image of the medical institutions and increases supervisors' awareness of education and training. This study makes only academic exploration; to increase the service quality of medicine, it is necessary to actually implement the PDDRO constructs of TTQS, making them link one another, to continuously improve and increase specialties and techniques in employees. It is also necessary to provide medical institutions with planning on future operational goals as reference in drawing up education and training, and further to increase future executive effectiveness of education and training systems in Taiwan. Easy words, if medical institutes or enterprises can help their internal personnel to conduct a functional analysis based on their business development concepts, visions, and missions, they can discover the functional gaps and undertake suitable function intensifying education and training according to the TTQS train quality system, so that the entire human operational efficiency and competitiveness can be lifted.

Since its planning and formulation till date, TTQS has been able to assist in the elevation of human resources and systematic planning, which positively helps the training mechanisms of medical institutions and thus can be extended to other business entities in Taiwan. For different needs of the industries, the basis of reference of TTQS project provides various counsel programs that facilitate multiplied benefits of counseling and successful promotion of talent fostering in the industries.

This study has reached its aims, there is an unavoidable limitation regarding the data performance evaluation. Because this study only focus on performance evaluations of talent quality-management system imported by medical institutions in central Taiwan. It would be better representing real situation if the data is the Asia or global.

References

- Aydin, S., Harputlu, L., Güzel, S., Çelik, S. S., Ustuk, Ö., & Genc, D. (2016). A turkish version of foreign language anxiety scale: anxiety scale: reliability and validity. *Procedia - Social and Behavioral Sciences*, **232**, 250–256.

- Bai, J. W., & Kung, Y. H. (2010). Analysis of Key Success Factors on the Taipei City Worker Union That Adopt TTQS. *Asia-Pacific Economic and Management Review*, **14**, 89-111.
- Bai, J. W., & Chen, W. D. (2013). Analysis of key factors of success in TTQS introduction by associations. *Employment & Labor Relations Quarterly*, **3**, 105-124.
- Chou, Y. A. (2007). How to apply ISO10015 PLUS validation to identify competence factor and performance factor of corporate competitiveness. Social network for business training contact.
- Fan, L. C. (1994). Introduction to In-depth Interview. *Research in Outdoor Play*, No.2, Vol. 725-35.
- Fangtsou, C. T., Chen, R. Y., & Yang, M. H. (2014). Optimizing recommendations with an rfid-based approach for the taiwan trainquali document management system. *International Journal of Electronic Commerce Studies*, **5**, 1-25.
- Han, H. L. (2014). Strengthening Effective Military Trainings by the. TTQS Management Principle. *National Defense Journal*, **29**, 101-120.
- Huang, P. L., Lee, B. C. Y., Wang, C. S., & Sun, C. T. (2017). Relative Importance of the Factors under the ISO-10015 Quality Management Guidelines that Influence the Service Quality of Certification Bodies. *Journal of Economics and Management*, **13**, 105-137.
- Hsieh, Ang-fen. (2009). A Study of Investigating Blog Knowledge Sharing Motivation and Behavior for Educational Application Blog. Master-degree thesis at National Chung Cheng University.
- Jou, Y. T., Wu, Y. C., & Lin, W. T. (2015). Applying decision tree and neural network to raise the performance of human training quality. *Journal of Quality*, **22**, 383-403.
- Li, C. H., Chen, C. J., & Chen, M. H. (2013). A Study for Taiwan Train-Quali System into International Tourist Hotel Industry. *Tamsui Oxford Journal of Tourism*, **11**, 13-37.
- Lee, F. H. (2009). Reliability and Validity. extracted on Sept. 10, 2013, [http://163.17.61.21/lobo/971210/reliability & validity.ppt](http://163.17.61.21/lobo/971210/reliability%20&%20validity.ppt).
- Lee, Y. H. (2011). Applying grey relational analysis to construct the training quality system in enterprise. *Journal of Grey System*, **14**, 107-115.
- Liao, P. W., Chao, C. C., Chang, C. H., & Yu, C. C. (2014). A Case Study of the Taiwan TrainQuali System of Taipei 101 based on the Competency Model. *Asia-Pacific Economic and Management Review*, **18**, 21-40.
- Lin, C. S. (2006). Human Resources Development and TTQS. *Employment Security*, **5**, 44-51.
- Lin, Y. H. (1998). A Study on the Evaluating Factors of River. a master-degree thesis at Feng Chia University, Taiwan.
- Lin, W. T., Kung, C. Y., & Lin, L. L. (2009). Comparing IIP, ISO10015 and TTQS. *Quality Magazine*, **45**, 52-56.
- Lin, W. T., Wu, Y. C., Tung, C. L., Huang, M. R., & Qin, R. S. (2010). Establishing ISO 10015 accreditation system performance model for domestic enterprises. *Expert Systems*

- with Applications, **37**, 4119–4127.
- Lin, W. T., Wang, S. J., Wu, Y. C., & Ye, T. C. (2011). An empirical analysis on auto corporation training program planning by data mining techniques. *Expert Systems with Applications*, **38**, 5841-5850.
- Tsai P. (2008). Medical Industry Analysis. *Industry Analysis Report* by the National Formosa University, Taiwan.
- Veiga, F. H. (2016). Assessing student engagement in school: development and validation of a four-dimensional scale. *Procedia - Social and Behavioral Sciences*, **217**, 813–819.
- Villa Medina, J. L., Boque, R., & Ferre, J. (2009). Bagged k-nearest neighbors classification with uncertainty in the variables. *Analytica Chimica Acta*, **646**, 62–68.
- Wan, W. L. (2004). Applications of In-depth Interviews in Qualitative Research. *Living Technology Education*, **37**, 17-23.
- Wang, C., & Chao C. (2009). A Case Study of the Successful Key Factors of Exploring Training Alliance--Changhua County Industrial Association. *Service Industry Management Review*, **7**, 24-48.
- Wang, Y., Huang, C., Chu, T., & Lee, L. (2012). Before and After Comparison of the Employee Perception Using TTQS-A Case Study of a Hospital in Taipei. *Quality Magazine*, **48**, 25–30.
- Yeh, C. H. (2011). Establishing assessment system for creation of natural parks from similar wetlands. *Journal of National Park*, **11**, 159-176.
- Yeh, M. C. (2009). The Application of Industrial Engineering and Engineering Management in Hospital Administration—an Example of Regional Hospital in North Taiwan. Master-degree thesis at the National Tsing Hua University, Taiwan.
- Yu, C. C. (1996). Delphi Technique and It's Application in Curriculum Study. *Journal of National Hualien Teachers College*, **6**, 1-24.