Examining the Relationship among TQM, Organizational Learning and Innovation Performance

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Abstract: TQM and organizational learning are considered as management practices that can enhance innovation performance. However, the question still remains regarding the nature of relationship among these concepts. Although there are many studies in the literature, most of them are prescriptive and case studies which did not provide evidence that can be generalized. Thus, this study examines the relationships among TQM practices, organizational learning capability and innovation performance and determines the mediating relationship between TQM and innovation performance through organizational learning. The data were collected by using on-line survey approach to manufacturing companies. One hundred and thirty nine Malaysian manufacturing companies participated in this study. The findings of this study supported all hypotheses.

Key words: Total quality management (TQM) • Organizational learning • Innovation performance • Partial Least Square PLS

INTRODUCTION

It is becoming increasingly difficult to ignore the vital role of innovation performance in preserving the organizations’ competitive advantage and its survival, especially in the environment characterized by rapid changes and turbulence. Innovation has been considered as, the fuel of growth of novel products and brands, as a current review of extant literature implies that most sustainment of incumbents, productivity, creation of new market, transformation of industries and promotion of the global competitiveness of a nation [1]. Amabile, Conti, Coon, Lazenby and Herron [2] identify innovation as the successful implementation of creative ideas in the organization. According to Alegre and Chiva [3], innovation is developed through the learning process of an individual and the group in an attempt to find novel ways to solve problems. Consequently, innovation appears to depend on the organizational learning capability of the company through which novel knowledge develops, is distributed and utilized [3]. According to Bontis, Crossan and Hulland [4] and Nonaka and Takeuchi [5], learning ability can motivate the capability of organizational innovation and can assist in maintaining a competitive advantage in trying types and environments. An organizational learning capability can be described as a set of tangible and intangible resources or skills the firm’s utilize in an attempt to achieve competitive advantage [3]. In this vein, reviewing the previous studies shows that many studies have considered total quality management (TQM) philosophy as an invaluable tool for encouraging learning and maximizing the company’s competitive advantage [6]. But a current review of extant literature implies that most of the papers dedicated to the topic are of a theoretical nature or case studies [6]. According to Barrow [7], the principal consequence of applying TQM is organizational learning, which leads to sustaining the competitive advantage. Although the previous discussion displays the integrating relationship between TQM and organizational learning, only a few empirical and quantitative studies have been conducted to examine this relationship [8]. Moreover, the previous studies examine the direct relationship between TQM and organizational learning capability. Therefore, only a very few studies have been conducted such as Hung et al. [8] who investigate the mediating role of organizational learning capability in the relationship between TQM and innovation performance. However, Hung’s et al.’s [8] study lacks the theoretical basis supporting this relationship. In addition, that study focuses only on
high-tech companies. Thus, there is need to examine this relationship in different and comprehensive sectors to be able to generalize the results.

Since many past studies have mentioned the direct relationship between TQM and innovation [9, 10], the current study tries to get a deeper understanding regarding this relationship through figuring out the indirect association between TQM and innovation through organizational learning capability with the help of absorptive capacity theory. Therefore, the purpose of this study is a) to examine the relationships among TQM practices, organizational learning and innovation performance in the Malaysian context by focusing on manufacturing sector; b) to determine the indirect relationship (mediating relationship) between TQM and innovation performance through organizational learning capability and finally, to provide empirical evidence regarding this relationship by using Partial least Square (PLS) statistical approach.

**TQM and Organizational Learning:** The relationship between TQM and organizational learning is complementary [11]. According to Garvin [11], to achieve improvement continually, solve problems, introduce products, re-engineer processes, all need considering the world in a new light and acting accordingly. The author also confirms that without learning organizations and individual will repeat old practices. Moreover, quality practices stimulate continuous improvement, change and learning [12]. Martinez-Costa and Jimenez-Jimenez [13] recommend that TQM practices should be applied to foster the organizational learning processes in the organizations. A culture based on critical quality management can quickly leverage employees as sources of new learning [12]. Furthermore, both supplier development and customer focus within fragmented markets have resulted in virtual organizations as pools of new knowledge from varying locations [12]. Stata [14] considers quality improvements as the engine that speeds up organizational learning. A review of literature reveals that TQM practices bring many benefits related to organizational learning in different ways that assist to build a suitable base for developing organizational learning and facilitating learning orientations comprising of vocational, academic, personal and social. Moreover, TQM practices posses advantageous synergy as they contribute to transferable skills including, communications, group work, personal, interpersonal and organizational skills, teaching and training, learning, information gathering, problem solving, language, information technology and entrepreneurship in the of organizational learning framework [15]. Ruiz-Moreno et al. [12] assert that TQM practices offer the chance to learn the nuances of what “excellence” means for the organization, the extent of the organization’s advance towards excellence, the extent of its capability and its position compared to other companies. The authors also refer that TQM practices provides leadership that believes on the importance of intellectual stimulation, individualized consideration and inspirational motivation, which has been considered as the idealized facilitators of organizational learning capability.

From the discussion above, it can be concluded that companies that apply TQM are inclined to learn much better than other companies. Thus, the current study proposes that TQM affect organizational learning.

**Hypothesis 1:** There is a positive relationship between TQM and organizational learning.

**Organizational Learning and Innovation Performance:** Saban [16] stated that organizational learning is a significant element in the innovation of new product development. He claims that prior to the improvement of the firm’s innovative capability, management should conduct an analysis of its present organizational learning. In the same line, Hughes and Chafin [17] expounded on the forces in the external environment characterized by the increasing technological customer demands that modify the product development lifecycle into an ongoing learning process.

Building on the existing literature review, innovation needs individuals’ to acquire existing knowledge whether internal or external to the company and share it throughout the company levels [18]. The acquisition of the external knowledge relies on the capacity of the company to absorb new ideas; in other words, the companies’ ability to assimilate and apply the new external knowledge to commercial ends [19]. According to Sanz-Valle, Naranjo-Valencia, Jimenez-Jimenez and Perez-Caballero [20], organizational learning reinforces the assimilative capacity of the companies. In the same context, Wang and Ellinger [21] indicate that organizational learning has considerable impact on an individual’s performance regarding their attitude towards learning and acquiring the knowledge. According to the previous discussion, it is notable that organizational learning is the antecedence of innovation, which helps to
provide the infrastructure that stimulates innovation performance. Therefore, the following hypothesis can be formulated:

Hypothesis 2: There is a positive relationship between organizational learning and innovation performance.

TQM and Innovation Performance: TQM’s principles include many practices that help the organizations to be open and nearer to the customers and these include, continuous improvement, a culture that encourages involvement of all the employees in decision-making, a cooperative relationship with the suppliers, decisions based on the fact and plans and support from the top management in different aspects to achieve the organizations’ aims [22] - all these principles have been considered as critical factors to innovation success [23].

Prajogo and Sohal [24] synthesize the role of the TQM principles in enhancing innovation performance. In this regard, customer focus is one of the TQM principles that stimulate organizations to determine constantly new customers’ needs and expectations and their latent desires, which provide useful data for companies to develop and introduce new products. Furthermore, the connection with suppliers in long-term relationship will help the supplier to provide suitable primary products based on customer perspective and market [25]. Likewise, continuous improvement encourages the creative thinking in different levels in the organization to improve the work and solve the problems in different ways [24]. The way that TQM principles are used to manage people asserts the development of the employees through involving them in many training programs, opening the door for suggestions, encouraging participating in making decision processes - all these practices encourage the people to be more responsible and more active to produce creative ideas [26]. Of course, all the previous practices need the top management support and commitment to apply all TQM principles successfully. Management is required to be tolerant, knowledgeable and open minded [26]. As result of the previous discussion the following hypothesis is formulated:

Hypothesis 3: There is a positive relationship between applying TQM and innovation performance.

From the previous discussion it can be summarized that organizational learning mediates the relationship between TQM and innovation performance. Thus, the following hypothesis is formulated:

Hypothesis 4: Organizational learning mediates the relationship between TQM and innovation performance.

Method: The present study uses a survey research method to collect the data to test the theoretical model. The instrument has been adopted from the related previous studies [22, 27, 28]. The 48-item survey was administrated to 500 manufacturing companies listed in the Federation of Malaysian Manufacturing (FMM). The unit of analysis for the present study consists of one of the following managers: CEO, quality manager, RandD manager, or factory manager who is knowledgeable of organizational practices on quality and innovation in their organizations. The data was collected by using on-line survey approach and the respondents were reminded by phone to complete the questionnaire and re-send it on-line. A total of 500 questionnaires were distributed randomly to the manufacturing firms. Out of these distributed questionnaires, 139 were returned, representing a response rate of 27.8%.

Data Analysis: Partial Least Squares (PLS) analysis, a Structure Equation Modeling (SEM) technique, was utilized for the present model’s assessment. SmartPLS version 2.0.M3 was used in data analysis to assess the measurement and structural models. Having an adequate measurement model pave the way to go further to test the structural model, the essential criterion for this assessment is the coefficient of determination (R²) of endogenous latent variables, where R² gets the following values (0.412, 0.576 and 0.995) respectively. By comparing the R² of the current study to the threshold values of R² (0.67, 0.33, 0.19) substantial, moderate and weak respectively [29], it can be said that the R² of this study is adequate. The second step in evaluating the structural model, is to examine path loadings between constructs to determine the significance by using bootstrapping and to compare it with computed T-statistic for two-tailed; Table (1) below shows the path coefficient of the inner model.

After excluding the mediating variable and running the direct relationship between TQM and IP, a significant direct relationship has been found (0.567, p> 0.001). Comparing to the path value between TQM and IP in

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<th>Table 1: The path coefficient values</th>
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<td>Construct</td>
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<td>H1: TQM -&gt; OL</td>
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<td>H2: OL -&gt; IP</td>
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<td>H3: TQM -&gt; IP</td>
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the two cases i) with mediating effect, ii) without the mediating effect, it is found that this path value reduces when mediating variable OL is in the framework. Thus, OL is established as a partial mediator in this relationship. This mediating effect of OL is confirmed by z statistic which comes out with 4.29 [30]. The result supports the mediating effect of OL in the relationship between TQM and IP (H4 supported), which implies that it has an indirect influence on IP. To estimate the size of the indirect effect, the current study used the variance accounted for (VAF) value, which represents the ratio of the indirect effect to the total effect. The VAF value indicates that 62% of the total effect of TQM on IP is explained by indirect effect (OL).

**DISCUSSION AND CONCLUSION**

This study contributes to the existing body of knowledge on the relationship between TQM and innovation performance mediated by organizational learning. The present study addresses the relationship between the TQM, organizational learning and innovation performance, especially the mediating role of organizational learning between TQM and innovation performance. The findings of this study confirm that TQM has a significant and positive influence on organizational learning and is consistent with that of the previous studies by Barrow [7], Martinez-Costa and Jimenez-Jimenez [13], who indicate that TQM practices provide a quality culture that correlate positively with organizational learning. The study also found that TQM has a significant and positive impact on innovation performance; a result compatible with past literature such as Juran [25], Prajogo and Sohal [27], where TQM practices are not just regarded as management tools but it enhances and reinforce the quality. TQM also creates a good environment for sharing knowledge, trust and learning, reflected in a positive manner on innovation performance.

The results of the present study indicate that organizational learning has a significant and positive influence on innovation performance whereby organizational learning is considered as antecedent of the innovation performance. Furthermore, organizational theory postulates that organizational learning is the processes of acquiring and developing new knowledge and capabilities, which have been considered as the main actions to enhance innovation performance of organizations [5, 11]. Furthermore, the present study shows that organizational learning partially mediates the relationship between TQM and innovation performance. The result also indicates that 62% of the total effect TQM on innovation performance is explained by indirect effect (organizational learning). This finding is compatible with Hung et al., [8] who examined the mediating effect of organizational learning by using SEM model.

Finally, this study has provided some useful managerial implications. One of them is that it justifies the resources and time invested in TQM and organizational learning initiatives by the firms to enhance the innovation performance. The findings of this study clarify the role of TQM as a strategy in reinforcing the organizational learning of the companies through providing and emphasizing on quality culture that associate positively with organizational learning within the organization. In addition, this study asserts the importance of developing organizational learning as one of the steps that provide open environment learning and following new trends of knowledge and technologies.

**REFERENCES**