



## International Journal of Economic Research

ISSN : 0972-9380

available at <http://www.serialsjournals.com>

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Volume 14 • Number 19 • 2017

## Managing Absorptive Capacity to Enhance the Influence of TQM Practices on Product Innovation Performance

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**Abstract:** Innovation, nowadays classified among the best strategies of the organizations' survival. However, innovation combines with high level of risk that requests certain level of capabilities in order to face different kinds of risks. Therefore, this study is an attempt to investigate the relationship between TQM practices, absorptive capacity and innovation performance. The sample size was manufacturing companies operating in Malaysia. The main findings indicate to the positive effect of applying TQM on absorptive capacity, while the relationships between TQM and innovation performance was not supported. In the light of the output several recommendations have been mentioned to the managers of the companies.

**Keywords:** TQM practices, Absorptive Capacity, Innovation Performance, Partial Least Square.

### INTRODUCTION

Innovation, nowadays considered as one of the strategies of the organizations' survival. However, innovation combines with high level of risk that requests certain level of capabilities in order to face different kinds of risks. These facts make achieving desired level of innovation in the performance difficult task to the organizations. Because of those specifics of innovation, innovation has gained the attention of both practitioners and academicians. In fact, many studies that have been conducted to explore how innovation performance could be improved, or, to be more specific, how could organizational performance be affected by improving innovation performance?

The study that has been conducted by Cohen and Levinthal (1989; 1990) introduces absorptive capacity as one of the critical capabilities that lead to enhance overall innovation performance of the organizations.

This study is one of valuable researches that goes beyond explaining innovation through the numbers of the new outputs have been introduced by the organization. Rather, Cohen and Levinthal in their study elucidate innovation through having several capabilities that make the organization more innovative. In this regards, Cohen and Levinthal (1989; 1990) identify absorptive capacity as the main antecedents' capacities that help to enhance the innovation performance of the organizations. Cohen and Levinthal determine absorptive capacity through three different capacities which are the ability to acquire, assimilate and use the knowledge in commercial end. Moreover, it has been determined prior related knowledge as the basic by which absorbing capacity will play a role to achieve the innovative output (Bosch, Volberda, & Boer, 1999).

Cohen and Levinthal in their paper highlight to the important of prior related knowledge in the absorbing processes within the organization through which the innovative output will be achieved. Moreover, existing knowledge has been considered as a pre-requisite of innovation performance (Quintane, Casselman, Reiche, & Nylund, 2011). Another view of point goes far to explain the important of knowledge in innovation performance by considering innovation as an outcome of the processes of knowledge exchanging and recombination (George, Kotha, & Zheng, 2008; Quintane *et al.*, 2011).

The importance of maintaining innovation performance for organizations' survival encourages the practitioners and researchers to find suitable strategies that build a solid infrastructure to support the innovation performance of the organizations (Popadiuk & Choo, 2006). To continue innovation, a system to manage knowledge need to be established well, through which, organizations will be able to outdo in several domains (i.e., technological, market and administrative knowledge creation) (Popadiuk & Choo, 2006). Hence, the organizational capabilities to generate and apply new knowledge are critical for innovation performance (Almeida, Song, & Grant, 2002). Accordingly, developing and improving the absorptive capacity of the organization will help to achieve the desired innovation performance. Although, innovation and knowledge are two concepts that have a strong but complex relationship, this relationship is rarely investigated (Popadiuk & Choo, 2006).

In another stream of studies, the relationship between innovation performance and another organizational disciplines such as TQM practices have been investigated (Cole & Matsumiya, 2008; Pinho, 2008; Singh & Smith, 2004). As TQM practices have proved it effectiveness in enhancing the performance of the organization in different area, for instance, financial performance, customer satisfaction, customer loyalty, reputation, etc. (Brah, Tee, & Rao, 2002; Ooi, 2009), innovation performance was one of the aspects that has been expected to be influenced positively by applying TQM practices (Pekovic & Galia, 2009; Prajogo & Hong, 2008). However, reviewing the previous studies shows the inconclusive results regarding the effects of implementing TQM on innovation performance. While some researchers confirm the positive effects of applying TQM on innovation performance, the other researchers still questioned the role and the relationship between TQM and innovation performance. Having this conflict finding among the previous studies gives hints to the need to investigate this relationship through mediate or moderate variable by which this relationship will be clearer (Baron & Kenny, 1986). Although the conflict finding is dominant in the literature this study adopts the view of point that confirm the positive effect of applying TQM practices on innovation performance. Therefore, the current paper tries to examine empirically the relationship between TQM practices and innovation performance through absorptive capacity. In other words, explaining the mediating role of absorptive capacity in the relationship between TQM practices and innovation performance is the main target of this study. The next section of this paper discuss the theoretical

part regarding the relationship among the variables, the related hypotheses are presented also in this section. The following section deals with the research methodology and the result of testing the reliability and validity of the constructs. The third section describes the results of testing the introduced model. The conclusion and the implications of the study are discussed in the last section.

### **The relationship between TQM and absorptive capacity**

On the basis of recommendations from psychologists, Cohen's and Levinthal's (1990) research emphasized on the significance of prior related knowledge use in improving the learning and problem-solving capabilities of an individual. This in turn assists him/her in tackling novel methods in particular areas. According to them, the learning capabilities cover the individual's understanding capacity of the current knowledge for the purpose of imitation, and problem-solving skills reflect his/her ability to product new knowledge for the purpose of innovation.

In this regard, Kim (1998) contended that both organizational learning and capabilities for problem-solving form the basis of organizational absorptive capacity. He emphasized the role of accumulated knowledge in supporting the identification, assimilation and employment of knowledge capabilities. It can therefore be stated that the absorptive capacity largely depends on the individual members of the organization, the development of communication among external and internal workforce, and among organizational units. It also depends on the firm employees' expertise distribution as this facilitates innovation and response to the dynamic environment (Bosch et al., 1999; Kim, 1998; Cohen & Levinthal, 1990).

Based on the discussion above, the current study argues that adopting and applying TQM practices provide the necessary platform that can help to enhance the innovative capabilities of the organization. In other words, TQM provides the necessary foundation that lead to reinforcing the absorptive capacity of organizations (Yusr, Othman, & Mokhtar, 2011), which in turn reflects positively on the innovative capabilities of the organization. Based on the argument above, absorptive capacity refers to the capacity to acquire, assimilate, and exploit the information in the best way to achieve sustainability in the marketplace.

Several practices should be applied to achieve TQM. Leadership and management commitment to accomplish high quality performance provides the organization with several facilities in many aspects either financial, systematical to create quality climate that consider that all employees responsible to achieve the organization's goals. Establishing such culture will encourage the employees to share the knowledge, having this attitude will help to institute systematic way to disseminate the valuable knowledge within the organization. Moreover, TQM also focus on customer and emphasis on building cooperative relationship with the suppliers which lead to enhance the organization's ability to acquire and get the knowledge from the surrounding environment. Beside this, applying TQM successfully needs to establish good system that guarantee flowing the knowledge and necessary data to manage the processes well, which in turn, help to set up the system to disseminate the knowledge, and, then the ability of the organization to apply the knowledge will be enhanced through making the right decision. To this end, the absorptive capacity of the organization will be reinforced by applying TQM practices. Consequently, the innovation capability will improve. Getting knowledge and sharing it within the organization keep the employees in touch with latest knowledge in different area related to their industry. Therefore, the skills and capabilities will be enhanced to achieve the desired performance.

Building on the previous discussion, the coming hypothesis is introduced

H1: TQM practices are positively associated with absorptive capacity

### **The relationship between absorptive capacity and product innovation performance**

By adopting Cohen and Leventhal's (1990) definition of absorptive capacity, through which set of capabilities have been assigned as representative of absorptive capacity, it has been found that such capabilities are critical for enhancing innovation performance of the organizations. In this regards, Tseng, Pai and Hung (2011) state that absorptive capacity permits organizations to come out with outputs which are quite different and have considerable influence on the innovation performance, and, by enhancing innovation performance, eventually, the capacity of constantly obtaining competitive advantage will improve. Furthermore, based on the level of absorptive capacity the R&D ability would stimulate, and then, increase innovation performance (Cohen & Leventhal, 1990).

Based on the fact that absorptive capacity is related to knowledge, the former concept got its significance in regards of innovation performance. Knowledge is considered as most strategically important resource and capabilities (Kogut & Zander, 1996). Beside, Darroch and McNaughton (2002) emphasized the role of knowledge in improving innovation performance. Furthermore, knowledge management has been cited as an antecedent of innovation performance (Darroch, 2005). Accordingly, it has been considered the organizations with high absorptive capacity can specifically attain the product effectiveness and market value though having more resources, experiences and activities (Tseng *et al.*, 2011). Thus, the higher the level of absorptive capacity the more innovations can be stimulated, and then resulting in remarkable performance (Tseng *et al.*, 2011).

Therefore, according to above discussion, the following hypothesis is proposed:

H2: Absorptive capacity is positively associated with product innovation performance

### **The relationship between TQM and product innovation performance**

Despite the conflicting findings in the previous studies as to the relationship between TQM and innovation, this study argues that TQM practices are being increasingly considered as the key source of innovation; this is in line with Lopez-Mielgo, Montes-Peon, and Vazquez-Ordas (2009) who indicated that TQM and innovation processes need to collaborate to develop new products. Moreover, Pekovic and Galia (2009) stated that quality system need to be established well through all of the organization to attain considerable product innovation performance. Pekovic's and Galia's conclusion is supported by Hung's et al. (2010) who also confirm that both constructs (i.e., TQM and innovation) are interrelated. Additionally, TQM has been considered as processes that provide a precondition environment within organization to enhance product innovation performance, which in turn, will lead to accomplish and maintain the competitive advantage (Prajogo & Sohal, 2003). Prajogo and Sohal also reported in (2004) that TQM includes several practices with different role on performance, thus, the same role of these practices gain the importance to determine the products innovation performance.

From theoretical perspective, the AC Theory, further, argues that knowledge is an essential block in product innovation successful. Therefore, ability of an organization to acquire knowledge is vital to enhance innovative abilities of any organization (Cohen & Levinthal, 1990). As stated above, applying TQM practices

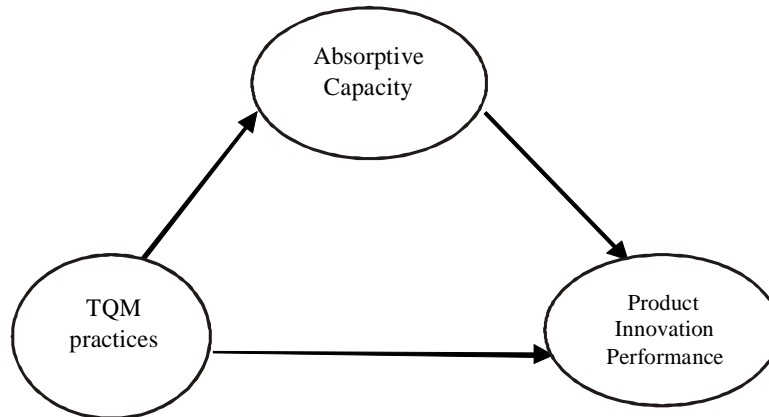
leads to establish the infrastructure by which the abilities of the organization to absorb the knowledge will be existed. Therefore, Hung et al. (2010) described TQM as more than a management tool used to promote and enhance quality as it also facilitates the appropriate environment that leads to product innovation enhancement. Hung et al. (2010) further add that practices like top management commitments, employees' engagement in decision making processes, focusing on customer as the ultimate goal stimulate employees to enhance products, processes, and organizational innovation performance.

Thus, according to the previous review of the literature, the coming hypothesis is formulated:

H3: TQM practices are positively associated with product innovation performance

Accordingly, it could be concluding that absorptive capacity mediates the relationship between TQM and innovation performance. Then the following hypothesis is proposed:

H4: Absorptive capacity mediates the relationship between TQM practices and product innovation performance



**Figure 1: The framework of the study**

## **RESEARCH METHODOLOGY**

### **Unit of Analysis**

According to the nature of this study which examines the hypothesized relationship on the level of business unit, the unit of analysis of the present study is manufacturing companies represented by the managers who work in certain positions. These managers can give right information, reflective of the real situation in the organization, especially regarding the variables of this study. Therefore, for this study, it was assumed that either the Chief Executive Officer (CEO), quality manager, R&D manager, or operations manager, has specific knowledge of quality practices, innovation performance, or knowledge processes within the organization.

### **Sampling Frame and Sample Size**

The sample frame is a list of the Federation of Malaysian Manufacturers (FMM) (FMM, 2016), which comprises around 2,307 manufacturers operating in Malaysia. This directory provides information on the

classification, size and nature of the companies, in terms of sales turnover and number of employees. As this study is on medium and large manufacturing companies, thus, the medium and large companies in the FMM list totaled about 774 manufacturers. Probability sampling is chosen in this research, where each of the elements of population has the same chance to be selected as sample subjects (Sekaran, 2003). Out of 400 questionnaires sent to the manufacturing companies, 166 questionnaires were returned and out of the 166, only 147 questionnaires were usable with response rate 36%.

### Data Analysis

To analyze the obtained data and achieve reliability in data analysis, this study used different statistical tools represented by SPSS version 18.0 and SEM, precisely Partial Least Square (PLS-SEM) SmartPLS version 2.0.M3. Furthermore, this study used a combination of both descriptive and inferential statistics method. While the former method helped this study in summarizing the obtained data by describing the sample characteristics (Babbie, 1990; Sekaran, 2003), the latter was used to test the hypothesized relationships presented in the conceptual model of the current study. According to Hair *et al.*, (2011), the paths that are non-significant or show signs contrary to the hypothesized direction do not support a prior hypothesis, whereas significant paths showing the hypothesized direction empirically support the proposed causal relationship, as shown below:

**Table 1**  
**Direct path coefficients of the inner model (Hypotheses)**

<i>Hypothesized Path</i>	<i>Path Coefficient (<math>\beta</math>)</i>	<i>T-value</i>	<i>P-value</i>	<i>Result</i>
TQM -> AC	0.835	33.563	0.000***	<b>Supported</b>
TQM -> IP	0.116	0.916	0.180	Not supported
AC -> IP	0.097	0.709	0.239	Not supported

\*\*\* Significant at level 0.001 (\*\*P<0.001)

### DISCUSSION AND CONCLUSION

The final result from the empirical data analysis shows that there is a positive and significant association at level of 0.001 of significance between TQM practices and absorptive capacity in Malaysian manufacturing companies. TQM, as a composite variable, ultimately aims to satisfy customers through continuous improvement processes (Hackman & Wageman, 1995; Kumar, Garg, & Garg, 2011). To achieve this goal, several processes and practices should be performed. Applying these processes and practices helps to make the organization more open and closer to its environment (Chourides, Longbottom, & Murphy, 2003; Skyrme & Amidon, 1997). This, in turn, drives the process of acquiring knowledge and make it available and accessible to the decision maker on the right time, making decision is one of the forms of applying acquired knowledge.

As for the relationship between TQM and innovation performance the obtained result shows that there is no significant association between TQM and innovation performance in the Malaysian manufacturing companies. However, this result is not surprising because it is in line with the findings of Singh and Smith (2004), Prajogo and Sohal (2006), Abrunhosa and Sa (2008), who found that there is no relationship between TQM and innovation performance, and, if there is relationship, it is weak and not significant. The



argument regarding these two concepts is still controversial between the group that support this relationship, and the other group which confirms that there is no relationship between TQM practices and innovation performance. However, the result of this study bolsters the second trend, which argues that the relationship between TQM practices and innovation performance cannot be direct, meaning it should be an indirect relationship studied through other variables.

On the other hand, the result shows that there is no significant association between absorptive capacity and innovation performance in the Malaysian manufacturing companies. From the view of this study this result is logic. The suitable justification is related to the general output of absorptive capacity which is knowledge, as has been mentioned earlier, and this outcome (i.e., knowledge) will not be able to achieve superior performance unless it comes through other initiatives like capabilities. In other words, the ability to use or apply the knowledge is the critical factor in achieving target performance. Further analysis supports this direction, where the result indicates that out of three capabilities of absorptive capacity, only one capability, which is the ability to apply gained knowledge ( $\beta = 0.401$ ,  $t = 3.765$ ,  $p < 0.001$ ), is found to be significantly associated with innovation performance. Further, this result is compatible with Hung *et al.*'s (2010) recommendation, where the authors stressed that knowledge management processes in organizations do not appear to affect the performance directly; organizations need to invest in the direct mediating processes to achieve superior performance rather than depend on direct relationship between knowledge management and innovation performance.

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