

TOTAL QUALITY MANAGEMENT AND SME PERFORMANCE: THE MEDIATING EFFECT OF INNOVATION IN MALAYSIA

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ABSTRACT

The purpose of this study was to discover the crucial issues between TQM and the performance of Malaysian SMEs. This paper also reviewed the need of the other variable in the relationship between TQM and Malaysian SME's performance; namely innovation. This paper then presents the empirical results carried out on the Malaysian SMEs covering the manufacturing industry. The measurement scale in this study was tested and found to be reliable and valid to examine the research model. The 124 samples obtained were assessed using Smart PLS in order to examine the structural equation model. Empirical findings in this study prove that TQM had an insignificant impact on innovation and performance. Moreover, innovation mediates the relationship between TQM and performance of SMEs in Malaysia. This study provides new evidence in the important area of TQM and innovation of Malaysian SMEs.

Keywords: TQM, innovation, SME performance, manufacturing, Malaysia

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INTRODUCTION

Small and medium enterprises (SMEs) play a crucial role in economic development especially in developing countries by contributing to overall industrial production, generating employment and reducing poverty (Arinaitwe, 2006; Aziz et al., 2014). According to the ASEAN Secretariat data, SMEs generate employment between 50% to 95%, contribute between 30% to 53% to GDP (gross domestic product) and generate 19% to 31% of the total exports in ASEAN (Asia News Monitor, 2011). Malaysian SMEs, account for 99.2% of the total business establishments, contribute 32% of GDP, 59% of employment, and generate 19% of the total exports to other countries (SME Corporation Malaysia, 2012). However, the contribution of SMEs to GDP in Malaysia is still much lower compared to other middle-income countries with 39% and 51% for high-income countries (SME Corporation Malaysia, 2015, in SME Annual Report, 2014). Nevertheless, it also shows how important SMEs are in shaping the Malaysian economic landscape and remain as the backbone of the industrial development in the country (Aziz et al., 2014; Saleh et al., 2006).

SMEs which face difficulties and challenges from the competitive business environment would be hindered to achieve sustainable growth. Quality is one of the major barriers that might hinder SMEs' growth (Mat Yunoh & Mohd Ali, 2015). Hence, SMEs were forced to put more concentration on quality management systems (QMS). QMS can enhance the quality of products or services offered by SMEs and this system is recognised as a platform to spur quality-related activities in organisations (Oke & Oke, 2014). In addition, Malaysian SMEs also have a low level of technology, innovation, and R&D (Abdullah et al., 2009; Ng & Kee, 2012). The percentage of innovating companies for small companies is still low compared to large companies with 74.26% for large companies and 35.75% for small companies (MASTIC, 2011).

This research is directed to explore the performance of Malaysian SMEs and intend to fill these research gaps through examining some practices of management or organisational factors in strategic management as a strategy to improve their performance. There are many previous studies examining either theoretically or empirically on Total Quality Management (TQM) application and implementation in organisations in the last two decades.

However, previous studies relating TQM to organisational performance provide mixed and inconclusive results (Brah & Lim, 2006; Carmona-Marquez et al., 2016; Elmuti et al., 1996; Hubiak & O'Donnell, 1996). These mixed and inconsistent results have led many scholars to propose to include other factors as mediators in order to influence the existing relationship (refer to TQM and business performance for this study) (Macaes et al., 2007; Pinho, 2008). This study aims to include other factors as mediators to determine the linkage between TQM and SME performance and, hence offer alternative perspectives in extending the existing knowledge. In order to bridge this gap, an investigation is truly needed by having innovation as a mediator of the relationship between TQM and SME performance since there is a dearth of studies that examine innovation, as a mediator of the relationship between TQM and SME performance, especially in the Malaysian context.

LITERATURE REVIEW

TQM and SME Performance

There is a relatively large body of empirical studies that measure business performance from a TQM perspective. The findings indicate that more research is needed on TQM practices and business performance. However, despite the significant relationship between TQM and performance, some recent studies have found negative and insignificant relationships between TQM practices and SME performance. For instance, recent findings show that customer focus and continuous improvement did not support SME performance (Jabeen et al., 2015). In addition, the impact of TQM toward business performance is also not established although the link is significant towards operational and quality performance (Danyen & Callychurn, 2015). These examples of inconsistent findings on TQM and performance show that the recent trends also published mixed results with regards to the linkage between TQM and performance.

TQM and Innovation

It is also crucial to stress that TQM dimensions, namely process management and people management, are among the important factors in building innovation capabilities, which in turn will spur and generate skills

and capabilities in organisations (Yusr et al., 2014). People management or a human-based approach is important in shaping a quality culture in organisations and finally promoting an innovation culture. Despite to this positive influence, in searching relevant previous studies, there were inconsistent and mixed findings of TQM and innovation (Laforet, 2011; Zehir et al., 2012). The researchers believed and highlighted several reasons why the implementation of TQM might have a negative impact on innovation performance. One of the reasons might be due to that TQM by itself could trap organisational improvement or incremental innovation, and this practices leads organisations to be narrow minded.

Innovation and SME Performance

Past studies revealed the relationship between innovativeness and organizational performance from the perspective of a customer or a market view (Akgün et al., 2009; Gunday et al., 2011). Furthermore, some past research also highlighted on the impact of innovation towards organisational performance. For instance, the impacts in terms of organisational effectiveness, such as based on productivity of a firm (Gunday et al., 2011; Lin & Chen, 2007; McDermott & Prajogo, 2012; Noruzy et al., 2012) and from a financial perspective, for instance profitability (Camisón & Villar-lópez, 2014; Gunday et al., 2011; McDermott & Prajogo, 2012; Oke et al., 2007). The findings by Oke et al. (2007) show that the SMEs are more focussed on incremental rather radical innovations. The results prove that there is a connection between innovation and performance derived from sales turnover growth in SMEs. This confirms the impact of innovation in organisations and provides a good basis for the re-emergence of innovation activities in SMEs.

Innovation Mediates TQM and SME Performance

The use of a mediator in relation to TQM and performance also caught the attention of other researchers. Ruiz-Moreno et al. (2015) believed there are other strategic resources which will influence organisational performance rather than depending on TQM solely. These researchers urged other researchers to concentrate on innovation since innovation and other capabilities will improve the implementation of TQM in organisations. The findings relating to innovation as a mediator are also supported by Dedy

et al. (2016). They were able to prove that the mediating role of process innovation in establishing a link between TQM and firm performance. In addition, Sadikoglu and Zehir (2010) proved that there is an impact of innovation as a mediator in which TQM and firm performance was mediated by innovation performance and employee performance.

Based on above statements, it is crucial to examine the impact of innovation as a mediator on the existing relationship between TQM and SME performance particularly in an emerging economy like Malaysia. Concerning the impact of TQM and innovation as one of the established strategic factor that gives a positive impact on organisational performance, this study proposes the following hypotheses:

- H₁**: TQM has a relationship with SME Performance.
- H₂**: TQM has a relationship with Innovation of SMEs
- H₃**: Innovation has a relationship with SME Performance
- H₄**: The relationship between TQM and SME Performance is mediated by innovation

METHODOLOGY

Procedures and Sample

This study used a sample derived from the Federation of Malaysian Manufacturers (FMM) and only focused on certain SMEs mainly in the manufacturing industry with ISO certification (813 companies). The systematic probability sampling was applied to select the element in the sampling frame. For this purpose, every third element in the sampling frame was selected, that provided 250 elements or companies. From those 250 companies, a link embedded for an online survey was sent via email to companies that had provided their email as part of their profile in the FMM directory. 124 valid responses were received and the recipients were either the owners or managers in their organisation. The decision in selecting the minimum sample size was based on (Hair et al., 2014), in which the minimum sample size recommended is at least 59 responses with a significance rate of 5% and 0.25% of minimum R² for PLS-SEM.

Measures

TQM was defined as seven practices namely; (1) leadership, (2) strategic planning, (3) customer focus, (4) information and analysis, (5) people management, (6) process management, and (7) supplier quality management. With respect on the scale between “1” - “5” (“1” denotes “strongly disagree” and “5” denotes “strongly agree”), respondent identified their perception of TQM practices applied in their organisations. There were two categories specifying innovation in the organization, namely organisational innovation and technological innovation. These adapted items were taken from (Camisón & Villar-López, 2014; Keskin, 2006; Calantone et al., 2002) and were expressed on the scale ranging from “1” - “5” (“1” denotes “strongly disagree” and “5” denotes “strongly agree”).

In addition, measurement of SME performance was+ based on two different measures; financial and non-financial items as proposed by Salaheldin, (2009). Over the past 12 months, respondents identified their organisation’s performance and gave a rating based on the scale ranging from 1 representing “greatly decreased” to 5 representing “greatly increased”.

Structural Equation Modeling and Analysis of Mediator

The SmartPLS version 3.0 was used to examine the structural equation modeling. In an effort to establish the model, wo different stages namely the measurement model and the structural model were used. The measurement model need to be tested in terms of reliability, and validity in order to establish a good prediction of items before proceeding to the next stage. While, the structural model was used in order to test the prediction of the model and the impact of innovation as a mediator of the relationship between TQM and performance was tested based on a hierarchical regression analyses of the total effect, direct effect, and bootstrapping approach (Hair et al., 2014).

RESULT AND DISCUSSION

Description of the Sample

Based on the SMEs response, the majority of companies were obtained from the food and beverages category that represented 22.6%, followed by the electrical and electronics category which consisted of 15.3%. The data also represented the business category focusing on machinery and equipment with 12.9%. A majority of the companies 62.9% established their business more than 15 years ago. With respect to the location of the companies, the majority of the companies were located in Selangor with 34.7% and the remaining of them were from various places such as in Melaka, Penang, Negeri Sembilan, Pahang and other states in Malaysia.

Measurement Model

A summary of the results based on convergent validity and internal reliability are presented in Table 1. Loading of each items as well as composite reliability (CR), and average variance extracted (AVE) were used to quantify convergent validity (Fornell & Larcker, 1981). The result shows that, the factor loading for all items were in the range of 0.710-0.888 and exceeded the minimum level of 0.7. In addition, the AVE also exceed the minimum recommended level of 0.5 (Hair et al., 2010) in which the data recorded in the range of 0.625 to 0.760, While, CR also passed its minimum recommended level of 0.7 (Fornell & Larcker, 1981) and ranged from 0.815 to 0.922 l.

Table 1: Finding of Measurement Model

Construct	Measurement Item	Loading	AVE	CR
Leadership	L1	0.830	0.663	0.907
	L2	0.871		
	L3	0.849		
	L4	0.753		
	L5	0.760		
Strategic Planning	SP1	0.844	0.704	0.922
	SP2	0.827		

Construct	Measurement Item	Loading	AVE	CR
	SP3	0.770		
	SP4	0.883		
	SP5	0.867		
Customer Focus	CF1	0.710	0.633	0.873
	CF2*	0.611		
	CF3	0.799		
	CF4	0.854		
	CF5	0.813		
Information and Analysis	IA1	0.853	0.701	0.921
	IA2	0.840		
	IA3	0.864		
	IA4	0.822		
	IA5	0.804		
People Management	PM1	0.732	0.605	0.859
	PM2*	0.650		
	PM3	0.790		
	PM4	0.817		
	PM5	0.768		
Process Management	PR1*	0.600	0.628	0.870
	PR2	0.775		
	PR3	0.732		
	PR4	0.860		
	PR5	0.798		
Supplier Quality Management	SQ1	0.798	0.595	0.815
	SQ2	0.740		
	SQ3	0.775		
	SQ4*	0.471		
Organisational Innovation	OI1	0.769	0.633	0.873
	OI2	0.862		
	OI3*	0.575		

Construct	Measurement Item	Loading	AVE	CR
	O14	0.830		
	O15	0.712		
	O16*	0.582		
Technological Innovation	TI1*	0.286	0.760	0.905
	TI2*	0.072		
	TI3*	0.605		
	TI4	0.888		
	TI5	0.880		
	TI6	0.847		
SME Performance	HR1	0.778	0.625	0.893
	HR2	0.824		
	HR3*	0.336		
	MR1	0.803		
	MR2*	0.495		
	MR3*	-0.355		
	MR4*	-0.135		
	FR1	0.776		
	FR2	0.771		
FR3*	0.435			

Note: Composite reliability (CR) = (square of the summation of the factor loadings) / ((square of the summation of the factor loadings) / (square of the summation of the error variances))

Average variance extracted (AVE) = (summation of the square of the factor loadings) / (summation of the square of the factor loadings) / (summation of the error variances)

* Items was deleted due to poor loading

Direct Effect and Mediation Analysis

Based on Figure 1, there was an insignificant effect of TQM ($p=0.282$) and SME performance and also an insignificant relationship identified between TQM and innovation ($p=0.510$). However, the relationship between innovation and performance of SMEs was significant ($p=0.012$). With regard to this result, hypothesis H1 and H2 were not supported and only H3 in which the direct link between innovation and performance of SMEs has established a relationship. In order to examine the effect of the mediating variable, several procedures had to be done as proposed by Hair et al.,

2014). It involves a procedure which calculate the direct, indirect effect and the variance accounted for (VAF). The variance accounted for (VAF) can be calculated by using this formula; $[\text{indirect effect} / \text{total effect}]$. As a result based on the finding in SEM, the result of the direct effect of TQM and innovation (Table 2) is $0.606 \times 0.509 = 0.308$. While, Table 3 shows the result of the indirect effect of TQM and SMEs via innovation with the value of 0.308. The next step was to calculate the total effect of TQM and SMEs. This was identified by adding the direct effect and indirect effect in which $[0.308 + 0.308 = 0.616]$. Therefore, the final VAF can be measured through dividing the indirect effect and total effect in which $0.308/0.616 = 0.50$. By having the value of 0.50 or 50% of VAF, it is proven that there is a mediating effect of innovation (partial) between TQM and SME performance since it is between 20% and 80%. Hence, hypothesis H4 was supported.

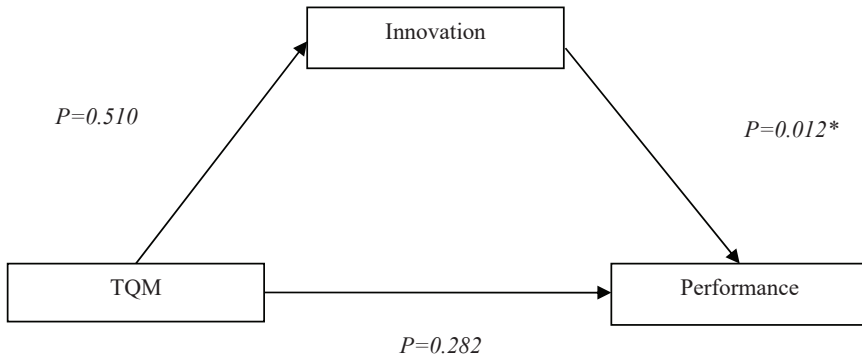


Figure 1: Model of TQM and Innovation as Predictor of Performance; Bootstrapping Result

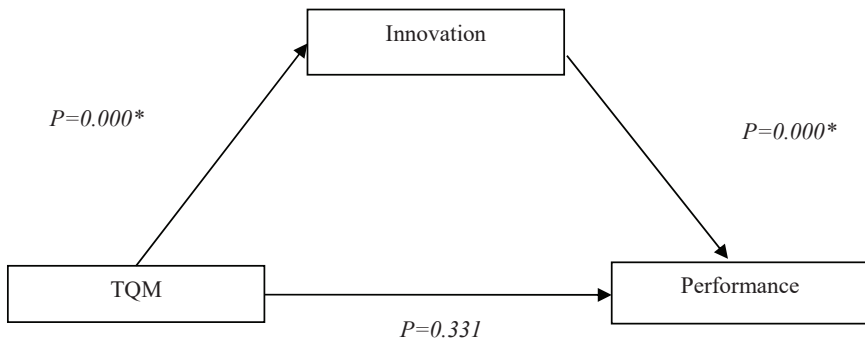


Figure 2: Model of TQM as Predictor of Performance, Mediated by Innovation

Table 2: Significance Analysis of Path Coefficients with The Innovation as Mediator

	Direct effect		Indirect effect
	TQM-INN	INN-SMEs	TQM-SMEs
OL-SMEs	0.606 (0.00**)	0.509 (0.00**)	0.308 (0.00**)

Table 3: Variance Accounted for (VAF) For Mediating Effect of Innovation

	Direct effect		Indirect effect
	TQM-INN	INN-SMEs	TQM-SMEs
OL-INN-SMEs	0.606 (0.00**)	0.509 (0.00**)	0.308 (0.00**)

Discussion

This study examined the linkage between TQM and SME performance and the effect of innovation as mediator on that relationship. The finding of this study shows that TQM did not influence innovation and performance of SMEs in Malaysia. Moreover, this finding indicates that there is a relationship between TQM and performance, but need to be mediated by innovation. Results of the hypotheses are summarized in Table 4. The possible reason for the insignificant relationship might be related to sampling as the length of time in implementing TQM may be one affected. Factor as explained earlier, there is a variation of TQM implementation based on the duration of practice by organisations. In addition, the lack of adoption of TQM in several organisations in Malaysia especially in small business (Zakuan et al., 2012) might have also influenced this insignificant relationship.

SMEs could improve their activities by focusing more on innovation in bringing positive impacts towards their performance. Apparently, the presence of innovation activities within organisations will spur the efficiency of the process and thus influence the positive performance of SMEs. Concentrating on innovation as a business strategy is crucial in today’s marketplace since it may give an impact for achieving a sustainable competitive edge (Gunday et al., 2011). Moreover, innovativeness applied in organisations gives an impact toward performance of SMEs (Olson & Schwab, 2000) and some findings identified in this study are consistent with previous studies.

Table 4: Result of Hypothesis Testing

Hypothesis	Relationship	Result
H1	TQM à Performance	Not Supported
H2	TQM à Innovation	Not Supported
H3	Innovation à Performance	Supported
H4	TQM à Innovation à Performance	Supported

The result also proved that TQM will only influence performance through the mediating effect of innovation as this strategic factor was found to be an effective strategy that can give a positive impact on performance of SMEs. This proves the need for innovation in improving the existing relationship of TQM and performance that is found to be insignificant in this study. However, since the relationship between TQM and innovation is found to be contradictory (H2), surprisingly, this variable is able to influence as a mediator between TQM and performance. This is believed to have happened due to the fact that innovation has a significant relationship with SME performance (H3), hence innovations in organisations still play an important role in improving SME performance.

CONCLUSION

This study also discovered that two hypotheses (direct relationship of TQM) are insignificant. However, the mediating effect of innovation on the relationship between TQM and SME performance was identified. Thus, it will provide a good basis for managerial implication to have an active involvement of practitioners of SMEs in Malaysia to participate on innovation activities, as this strategic orientation might influence innovativeness and at last will create a competitive advantage among SMEs especially in the emerging markets.

This study also makes a significant contribution to the field of SMEs in the context of a developing country. These findings provide evidence that innovation is an important strategic orientation for SMEs although the impact of TQM on SME performance and TQM on innovation were varied. Thus, empirical findings provided significant evidence that managers of SMEs in Malaysia believe that they are practising and developing this strategic

orientation in their organisations due to the impact of innovation to both financial and non-financial performance of SMEs. Thus, SMEs in Malaysia are urged to adapt technological innovation in response to seek improvement in product decision and in quality especially for those companies that are related to and feed components or parts to large organisations.

This study employed a unique approach and differs from similar studies focusing on SMEs in Malaysia whereby there is a limited number of studies using SEM, especially a partial least squares method in testing the research model. This is supported by previous researchers who urged researchers to put more focus on testing the relationship between TQM and innovation by using SEM. Additionally, this study is also believed to contribute methodologically not only by identifying the critical success factors (CSFs) of TQM, but also in terms of selection and evaluation TQM practices within the SME settings in which this contribution is limited to the Malaysia context. Furthermore, because this study only measured the use of self-reported data and only concentrated on a quantitative analysis in examining the framework, it might be useful to employ mixed methods, which include a qualitative analysis to strengthen the research findings. In addition, the study can be extended to different industrial contexts, particularly in the service industry.

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