EPH - International Journal of Business & Management Science
ISSN (Online): 2208-2190
Volume 06 Issue 04 December 2020

DOI: https://doi.org/10.53555/eijbms.v6i4.110

THE IMPACT OF INNOVATION AMBIDEXTERITY AND ENTREPRENEURIAL ORIENTATION ON INNOVATION PERFORMANCE IN SMEs

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Abstract:-

SMEs are the key source of innovation and economic growth and play a crucial role in enhancing productivity and competitiveness. Innovation is a tool for SMEs to gain a competitive advantage and be successful. This paper aims to identify the impact of innovation ambidexterity and entrepreneurial orientation on technology-based SME innovation performance in Malaysian SMEs. A quantitative method is deployed using an online survey. A total of 115 responses were collected and analysed using PSPP. The findings disclosed that innovation ambidexterity, which comprises innovation exploration and exploitation, positively impacted innovation performance. The entrepreneurial orientation moderated and enhanced the relationship between innovation ambidexterity and innovation performance. The findings proved that SMEs are currently utilizing innovation exploration and exploitation, which help them remain competitive. The results are expected to provide a piece of fundamental knowledge concerning entrepreneurship and innovation from the context of SMEs. Consequently, the outcomes would support the SMEs in embracing Industrial Revolution 4.0 and SDG 2030 through better programmes and training to increase and strengthen their competitiveness.

Keywords: - *Innovation Ambidexterity, entrepreneurial orientation, innovation performance, SME, Malaysia*

INTRODUCTION

Small and Medium Enterprises (SMEs) form 98.5% (907,065) of business establishments in Malaysia (SME Corp. 2019). They play a significant role in Malaysia's economic backdrop with the SME Corporation Malaysia (SME Corp) overseeing the realisation of development programmes for small and medium enterprises (SMEs) across all related government and nongovernment agencies in Malaysia. In seeking to unleash the untapped potential of SMEs, as well as to allow the quantum leap in their growth, the National Entrepreneurship Policy 2030 was launched with the hope of a greater contribution towards Malaysia's economy from this sector. However, the contribution of SMEs to the gross domestic product (GDP) only increased marginally to 38.9 per cent in 2019 from 38.3 percent in 2018 (Department of Statistics Malaysia, 2019); well short of the target contribution of GDP 41%.

SMEs' performance is centred on innovation. The Asia-Pacific Economic Cooperation (APEC) outlined four priority areas: (i) entrepreneurship, innovation, and the Internet & digital economy; (ii) market access for SMEs; (iii) financing for business expansion and capability development; and (iv) inclusive business ecosystem that supports SME growth for their Small and Medium Enterprises Working Group (SMEWG) Strategic Plan for 2017 – 2020 (APEC, 2019). The entrepreneurship programmes for ASEAN SMEs by the ASEAN Secretariat also encourages productivity, technology, digitization, and innovation.

Many studies on the innovation practices of SMEs in Malaysia have shown inconsistent findings. A study by Marmaya et al. (2018) found that information utilization was one factor that influences SMEs' performance and further suggests that creativity and innovation are vital survival tools for SMEs. Another study, by Bhuiyan et al. (2016), showed that SMEs are adapting and practicing innovation in their entrepreneurial activities, such as product innovation and process innovation. The statement is further supported by Hanifah et al. (2019) who found that innovation strategy had a significant impact on SMEs' innovation performance. However, Ismail et al. (2014) found that even though the management of Malaysian SMEs is aware of the role innovation plays in the firm's growth, they lack the focus to utilize innovation to gain their competitive advantage. Looking at the gaps, SMEs must understand the importance of innovation ambidexterity practices.

Explorative and exploitative innovation has emerged as one of the management research's main questions (Chang & Hugher, 2012). Recently, innovation ambidexterity has gained recognition in helping SMEs perform better; however, there is a disproportionate gap in the study of innovation ambidexterity, particularly in small-to-medium-sized firms (SMEs). This study focuses on the relationship of innovation ambidexterity, entrepreneurial orientation, and SMEs' innovation performance in Malaysia.

Research Background

Innovation Ambidexterity

Innovation applies specifically to implementing new, better ideas that are an enhanced way of doing things (Van de Ven, 2017; West and Rickards, 1999). According to Raisch and Birkinshaw (2008), exploitative (gradual) and explorative (revolutionary) innovation is the central theme in the technical literature.

Explorative innovations include selection, improvement, and efficiency-oriented activities, while exploratory innovations build on search, discovery, and experimentation. In particular, exploration thus entails "experimenting with new alternatives" with "uncertain and distant returns," and exploitation is the "refinement and expansion of existing competencies, techniques and paradigms" with "approximate and predictable returns" (March 1991: 85).

The innovative ambidexterity literature has focused primarily on large and multi-unit companies (Jansen et al., 2006; Raisch and Birkinshaw, 2008; Raisch et al., 2009; Huges et al., 2020). However, researchers recognize that it is impossible to generalize empirical findings in large firms to small firms. Due to the limited management expertise of SMEs, they struggle to practice innovation ambidexterity. Therefore, previous research has found evidence that SMEs appear to achieve ambidexterity in technology differently from their larger counterparts (Cao et al., 2009). Exploratory technology can create a competitive advantage in dynamic environments for companies that become first movers and explore new opportunities in emerging markets (Zahra and Bogner, 1999). However, exploration may improve the ability of a company to renew its knowledge base but may disrupt current operations to the detriment of future opportunities (Gibson and Birkinshaw, 2004). Often larger companies have trouble in doing exploratory innovation due to the nimbleness and speed required. The structure of larger companies is more suited to exploitative innovation in that their size can be used to scale up production efficiently (Alänge & Steiber, 2018).

Describing Entrepreneurial Orientation (EO), entrepreneurial-oriented practices include both effectively generating new (exploration) market opportunities and efficiently optimizing existing resources in organizational operations to maintain existing (exploitation) opportunities (Arend, 2014; Kollmann & Stockman, 2012). Companies with a strong entrepreneurial orientation are more likely to pursue explorative and exploitative innovation as they could adapt and shape the market environment (Hult & Ketchen, 2001; Wiklund & Shepherd, 2003). Moreover, the ambidexterity literature suggests that ambidexterity, which encompasses creativity ambidexterity, is a dynamic capacity (O'Reilly & Tushman, 2008; Zhan & Chen, 2013) since the development of dynamic capacity is focused on both exploitative and exploratory activities (Benner & Tushman, 2003). For the reasons outlined in the previous discussions, it is argued that EO is likely

to be influential in promoting ambidexterity innovation as it allows companies to orchestrate and redeploy organizational sources for both explorative and exploitative innovation (Arend, 2014; Ireland, Hitt & Sirmon, 2003; Sirmon et al., 2011). Exploitation skills should complement the exploratory efforts that can lead to longterm success. Accordingly, previous researchers have stated in the literature that an ambidextrous company is capable of exploiting existing skills and exploring new opportunities with equal dexterity (Lubatkin et al., 2006), and also that achieving ambidexterity allows a company to improve its performance and competitiveness (Cao et al., 2009).

Entrepreneurial Orientation

The in-depth and systematic debate about the idea of entrepreneurial orientation began in the 1970s. In this field, Miller et al. made essential contributions. Miller (1983) suggested that any organization that adopts an entrepreneurial orientation approach should have three essential characteristics, i.e., creativity, risk-taking, and context. Innovation can promote new concepts, creativity, and the use of creative processes (Miller and Friesen, 1983; Kropp et al., 2006; Chandra et al., 2009). In this context, Engelen et al. (2015) identified entrepreneurial orientation as the business ability to perform innovation-related activities, take risks, and pioneer new actions.

Entrepreneurial orientation is conceived as the strategic position for creating new business offerings, taking risks for developing new products or services and markets, and being more aggressive than their rivals in terms of new prospects (Covin and Slevin, 1991; Lumpkin and Dess, 1996; Miller, 1983; Wiklund and Shepherd, 2005). Innovation tends to promote new concepts, creativity, and creative processes (Miller and Friesen, 1983; Kropp et al., 2006; Chandra et al., 2009; Shan, Song and Ju, 2016). Previous studies confirm the existence of a positive relationship between entrepreneurial orientation and market success (Miller, 1983;

Covin and Slevin, 1989; Zahra and Covin, 1991; Zahra and Covin, 1995; Lumpkin and Dess, 1996; Barringer and Bluedorn, 1999; Wiklund and Shepherd, 2005; Davis et al., 2010; Hernández-Perlines et al., 2016).

Entrepreneurial orientation has provided a great deal of knowledge because of the focus of business and management researchers (Covin & Miller, 2014; Covin & Slevin, 1989; Hernandez-Perlines, 2018; Kropp, Lindsay, & Shoham, 2006; Rigtering, Eggers, Kraus, & Chang, 2017). Hence, innovativeness, assertiveness, and risk-taking actions are at the core of entrepreneurial orientation, built and directed by the top management team (Poon, Ainuddin, & Junit, 2006) as the determining factors in the competitive strategy of an organization (Rigtering et al., 2017). Risk-taking means undertaking risky measures requiring large asset rates with no assurance of potential profits (Kraus, Rigtering, Hughes, & Hosman, 2012; Lumpkin & Dess, 1996a; Rigtering et al., 2017). For its part, proactiveness includes predicting potential needs and desires, and finding the advantage of innovative possibilities in new business ventures (Covin & Slevin, 1989; Lumpkin & Dess, 1996a; Rigtering et al., 2017). Lastly, innovation includes a creative process that supports experimentation and new ideas (Chandra, Styles & Wilkinson, 2009; Covin, Eggers, Kraus, Cheng & Chang, 2016; Kropp et al., 2006; Miller & Friesen, 1983). This approach allows individual analysis of the direct effects of entrepreneurial orientation on corporate performance and the indirect effects of innovation, proactivity, and risk assumption on corporate performance (Hernández-Perlines, MorenoGarcía, & YañezAraque, 2016). However, from a theoretical and an empirical point of view, existing research indicates that entrepreneurial orientation has a positive impact on firm performance (e.g., Filser et al., 2014; Hernandez-Perlines, 2018; Poon et al., 2006; Saeed, Yousafzai & Engelen, 2014; Shirokova et al., 2016; Wales et al., 2013).

Innovation Performance

Innovation begins with creating new ideas about how to do things better, and Heffner (2006) considered innovation to be a means of retaining competitive advantage from the start of the industrial revolution. Rogers (1995, p.276) described innovation as "an idea, commodity, or method, process, system, or tool that is regarded as new to a person, an institution, or company, or an industrial sector, or a society as a whole." Simultaneously, the word 'performance' focuses primarily on effectiveness and productivity (Wei, 2003). Thus, innovation performance is a comprehensive evaluation of the activities of organizational innovation and a key driver of business performance (Bai et al., 2015).

There are several ways of measuring innovation performance. One is to look at the benefits of introducing technological innovation practices that include an enterprise's political, social, and technological advantages (Al-Ali et al., 2017). The innovation performance can also be measured by the number of new products, new product sales revenue, and the number of patents. (Nuruzzaman et al., 2018; Anderson et al., 2015)

Following Prajogo and Sohal's approach (2004; 2006), the study concentrates on innovation as a performance outcome referring to new products and processes produced by the company to provide the customer with new values based on criteria, such as the number of innovations, rate of innovation, creativity, or being the first on the market. While there are different types of inventions, most studies focused primarily on product and process innovation (Prajogo and Sohal, 2001; Jeong, Chung & Roh, 2019). Product innovations are the latest goods and services produced for customer satisfaction, while process innovations are about improvements in manufacturing or service operations (Damanpour, 1991). March (1991) suggested that product innovation has two types, explorative and exploitative, indicating that innovation can be accomplished by exploiting existing products or exploring new ones. Although there are different definitions of

exploration and exploitation, the concept of these two words focuses on learning, gaining, and understanding new knowledge (Gupta et al. 2006; Ireland and Webb 2007).

Innovation is characterized not only as technological innovation but also as organizational learning processes and change to promote and stimulate innovation (Gomes, G. & Wojahn, R.M. (2017; Kanter, 1984). Based on the resource-based approach, an enterprise's innovation performance is grounded in the underlying human capital that cannot be repeated and exchanged (Ireland and Webb, 2007). Consequently, the term performance in innovation is linked to organizational learning practices. Empirical studies tended to follow a company's financial and advertising performance as the parameter outcome of organizational learning success, either a subjective measure or an objective measure. Several empirical studies have recently shown that an organization's ability to learn has a positive effect on organizational innovation performance (Laeeque, Babar & Ahmad, 2017; Garcı'a-Morales et al., 2007; Lo'pez et al., 2005).

From the theoretical and empirical point of view, the existing research indicates that innovation ambidexterity and entrepreneurial orientation positively impact innovation performance (Cao et al., 2009; Kraus et al., 2012). However, the impact of entrepreneurial orientation on innovation ambidexterity towards innovation performance has yet to be observed. Perhaps there is some mediating effect between these factors in enabling innovation performance. Therefore, the following hypotheses incorporates our expectations:

H1: Innovation ambidexterity has a positive relationship with innovation performance
H2: Innovation ambidexterity has a positive relationship with entrepreneurial orientation
H3: Entrepreneurial orientation has a positive relationship with innovation performance
H4: Entrepreneurial orientation mediates the relationship between innovation ambidexterity and performance

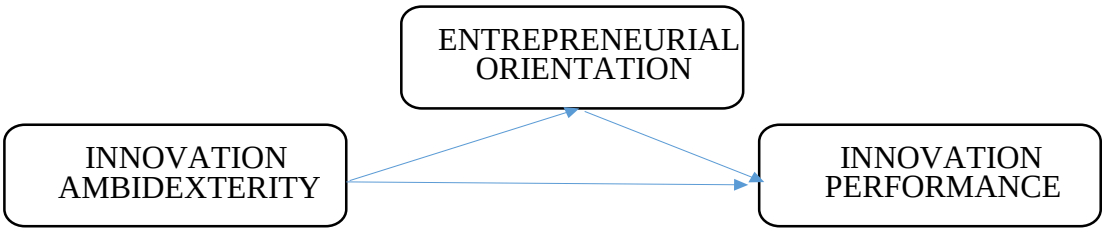

Figure 1: Research Framework

Methodology

The research was done using a survey via an online questionnaire that was posted at https://www.surveymonkey.com/r/KJ6D6SN. A hyperlink to the questionnaire was then shared through social media platforms, such as Facebook and Twitter, along with a message blast via communications platforms, such as WhatsApp and Telegram. The questionnaire consists of 54 questions, with 43 related to the research framework, while the rest cover the respondents' background, such as demographic information and the type of company they represent. Respondents were asked to rate their response on a 5-point Likert scale from 1 to 5.

The measurements were adopted from previous authors.
To obtain the responses, the researchers used convenience followed by snowball sampling via the network of Entrepreneurs. These respondents then invited others to the survey by sharing the hyperlink to the online questionnaire. Responses were also received from random visitors on the social media platform used for the survey. The data gained from the survey were then analysed using PSPPire, and the open-sourced alternative to SPSS made by the Free Software Foundation, version: GNU pspp 1.2.0-g0fb4db. The analysis includes a profile of the companies that responded to the survey, selected descriptive statistics, Pearson's correlation, and regression analysis.

Results and Discussion

After a month of data collection, a total of 115 responses were gathered from the online survey. Of these responses, 33 percent were from a sole proprietorship, while 53.51 percent were from partnerships. The total figure included other types of company, which also included private limited companies with 13.16 percent of the overall response, as depicted in Table 1

Table 1: Company Profile

	Frequency	Percent
Company Type		
Other	15	13.16
Sole Proprietor	38	33.33
Partnership	61	53.51
Total	114	100
Length of time in business		
less than 2 years	27	23.68
2 - 5 years	41	35.96
5 - 10 years	19	16.67
More than 10 years	25	21.93
Missing	2	1.75
Total	114	100
Number of Employees		
less than 5	18	15.79
6 - 30	44	38.6
31 - 75	23	20.18
75 - 200	9	7.89
More than 200	20	17.54
Total	114	100
Annual Sales		
less than RM300,000	31	27.19
RM300,001 - RM3 Mil	38	33.33
RM 3 Mil - RM 15 Mil	29	25.44
RM15 Mil - RM20 Mil	3	2.63
More than RM20 Million	13	11.4
Total	114	100

Of these companies, 24.11 percent have been around for less than two years, 36.61 between two and five years, 16.96 between five and ten years, while the rest (22.31 percent) have existed more than ten years. Two responses did not give any answers and were deemed missing. About 38 percent of the responses employ between 6 to 30 people, 20.18 percent of the responses employ between 31 and 75 people, and 17.54 responses employ more than 200 people in their business. One third or 33 percent of the responses have annual revenues between RM300,001 and RM3 million. Those who have a revenue of less than RM300, are second at 27.19 percent, with those who have revenue of between RM3 million and RM5 million trailing closely at 25.44 percent. Of the responses, 11.4 percent came from companies that obtain a revenue of more RM20 million annually.

Table 2: Descriptive Statistics

	N	Mean	Std Dev	Min	Max
Innovation Ambidexterity	115	2.08	0.57	1	4
Entrepreneurship Orientation	115	2.17	0.62	1	4
Innovation Performance	115	2.33	0.76	1	4.67

Table 2 provides descriptive statistics on innovation ambidexterity, entrepreneurship orientation, and innovation performance. The responses scored less than 3 for all the variables measured out of a maximum of 5. The innovation ambidexterity level was the lowest with a score of 2.08, followed by entrepreneurship orientation at 2.17, and innovation performance at 2.33.

Table 3: Reliability Test

Variable	Item	Cronbach Alpha
Innovation Ambidexterity	8	0.927
Entrepreneurship Orientation	6	0.881
Innovation Performance	3	0.894

Table 3 presents the reliability test of the variables. All the Cronbach alpha coefficients are more than 0.7, as recommended by Nunnally (1978). The result indicates that all the variables have good internal consistency; therefore, the measurements were valid to proceed to the next analysis.

To measure the extent of the relationship between the variables, the Pearson Correlation was chosen due to the responses' numeric and continuous nature. The findings showed that all the variables have significant and positive relationships

between all of them. Innovation ambidexterity has the highest correlation with entrepreneurship orientation at 0.83, followed by the relationship between innovation performance at 0.69, with the relationship between innovation ambidexterity and innovation performance coming in last at 0.65. Table 4 depicts the relationships between all the variables in table format.

Table 4: Correlation

	1	2	3
Innovation Ambidexterity			
Entrepreneurship Orientation	0.83*		
Innovation Performance			
	0.65*	0.69*	

*significant at 0.05

The next step in understanding the relationship between these variables is through regression analysis. The study also investigated whether entrepreneurial orientation mediates the effect of innovation ambidexterity towards innovation performance. In testing the hypotheses, two rounds of analyses were carried out. The first was a simple regression between innovation ambidexterity and innovation performance, while the second analysis was the multiple regression of innovation ambidexterity and entrepreneurial orientation on innovation performance. The two analyses illustrated the changes in the impact of various independent variables on the dependent variable, whether there are changes in the R-squared score or Beta of the regression equation, or any other observable change due to adding or removing independent variables.

In the first run, the regression of innovation ambidexterity and innovation performance resulted in an R-squared of 0.42, indicating a moderately strong relationship between these two variables. The R-squared value was backed by an F-test score of 81.28, which made the relationship of these variables statistically significant at a p-value lower than 0.05. The beta for this relationship was at 0.65, with a p-value also lower than α=0.05.

The entrepreneurship orientation for the second run of regression analysis yielded an R-squared of 0.49, an increase of 0.07. Despite the higher R-squared score, the F-test score was found to decline to 54.83, despite being statistically significant with a p-value lower than α=0.05.

As for the individual independent variables, after the inclusion of entrepreneurial orientation, the innovation ambidexterity B and Beta values declined to 0.31 and 0.23, respectively. The ttest score also decreased from 9.02 to 1.94, making the test's p-value increase to 0.055, and, therefore, above the α =0.05 threshold required to qualify for statistical significance. The results exposed a few issues. The first relates to the mean value that we obtained from the respondents for all the variables. The earlier results showed that all the mean values were less than 3, with innovation ambidexterity being alarmingly close to the mean value of 2 at 2.08. This finding indicates that the level of innovation, either exploitative or explorative, is probably severely lacking among the respondents. This does not bode well for the long-term competitiveness or survivability of these firms. Similarly, the scores being lower than 3 for entrepreneurship orientation and innovation performance compounds the indication that these companies are not as competitive as they should be.

The second issue is the level of correlation that all the independent and dependent variables have to each other. From the results, there is a correlation between all of them, and they are statistically significant. However, there is a cause for concern since the correlation score between innovation ambidexterity and entrepreneurial orientation is alarmingly high at 0.83, which suggests that multicollinearity could be an issue.

The third issue is the impact of entrepreneurial orientation on the mediating innovation ambidexterity's effects on innovation performance. Based on the results, it can be safely said that entrepreneurial orientation does provide some mediating effects on innovation ambidexterity. From Table 5, when entrepreneurial orientation was included in the regression and innovation ambidexterity, the R-squared from the initial regression increased from 0.42 to 0.49, followed by a decrease in the F-test, B, and Beta number for the individual regression of innovation ambidexterity towards innovation performance. The F-test score went from 81.28 to 54.83, B went from 0.86 to 0.31, while Beta went from 0.65 to 0.23. Perhaps, more importantly, the t-test score went down drastically from 9.02 to 1.94, causing the p score to shoot up above the α=0.05 level to 0.055, thus failing the significance test for the relationship between these two variables.

Although the signs of mediation exist from entrepreneurial orientation, it is essential to realize that there seems to be a possibility of multicollinearity between innovation ambidexterity and entrepreneurial orientation from the correlation test earlier. Based on the regression and correlation test, multicollinearity is highly likely to be at play here. There is probably a significant overlap between these variables in predicting innovation performance. This finding seems to go in line with other studies, such as Engelen et al. (2015), who incorporated innovation as a major part of entrepreneurial orientation. Perhaps, since innovation ambidexterity is a subset of general innovation using entrepreneurial alone without innovation, ambidexterity is sufficient to predict innovation performance. Table 6 presents the results of the hypotheses.

Table 5: Regression Analysis

		First Run	Second Run	Change
Model Summary				
	R	0.65	0.7	▲
	R Square	**0.42**	**0.49**	▲
	Adjusted R Square	0.41	0.49	▲
	Std. Error of the Estimate	0.58	0.54	▼
ANOVA				
Regression				
	Sum of Squares	27.47	32.48	▲
	df	1	2	na
	Mean Square	27.47	16.24	▼
	F	**81.28**	**54.83**	▼
	Sig.	0.00	0.00	
Residual	Sum of Squares	38.18	33.17	▼
	df	113	112	na
	Mean Square	0.34	0.3	▼
Coefficients (Innovation Performance)				
	Constant			
	B	0.54	0.36	▼
	Std. Error	0.21	0.2	▼
	Beta	0	0	na
	t	2.62	1.8	▼
	Sig.	0.01	0.075	▲
	Innovation Ambidexterity			
	B	**0.86**	**0.31**	▼
	Std. Error	0.1	0.16	▼
	Beta	**0.65**	**0.23**	▼
	t	9.02	1.94	▼
	Sig.	**0.000**	**0.055**	▲
	Entrepreneurship Orientation			
	B		0.61	-
	Std. Error		0.15	-
	Beta		0.5	-
	t		4.11	-
	Sig.		0.000	-

Table 6: The hypotheses results

Hypotheses	Description	Remark
H1	Innovation ambidexterity has a positive relationship with innovation performance.	There is a strong and positive correlation between innovation ambidexterity and innovation performance (0.65)
H2	Innovation ambidexterity has a positive relationship with entrepreneurial orientation.	There is a positive correlation between ambidexterity and entrepreneurial orientation (0.83)
H3	Entrepreneurial orientation has a positive relationship with innovation performance.	There is a strong and positive correlation between ambidexterity and performance (0.69)
H4	Entrepreneurial orientation mediates the relationship between innovation ambidexterity and performance.	Entrepreneurial orientation is observed to have a mediating effect. However, due to the high correlation between ambidexterity and entrepreneurial orientation, the effect of multicollinearity could distort the results of the findings.

Conclusion

The paper's objective is to distinguish the impact of innovation ambidexterity on innovation performance and explore the role of entrepreneurial orientation as a mediating variable. The positive impact of innovation ambidexterity on innovation performance postulates a good practice in SMEs. SMEs need to explore and exploit innovation to produce innovative products, services, or processes. A strong influence of innovation ambidexterity on entrepreneurial orientation provides a basis for how SMEs can utilize the competencies and capabilities towards innovation practices. This study has proven that SMEs are practicing innovation ambidexterity; however, the intensity is still questionable. There are a few limitations in this study. First of all, the small number of respondents might influence the output of the analysis. The online survey might pose specific issues, such as a poor understanding of questions. Future research should expand to other SME sectors, bigger population, and use a qualitative approach to gather rich information. The study has filled the gap of innovation studies in SMEs, especially in Asia.

ACKNOWLEDGEMENT
The authors would like to thank Universiti Teknologi MARA (UiTM) for the support and funding the study through the internal grant (600-IRMI 5/3/LESTARI (037/2018). The authors would also like to thank all the departments, organisations, and individuals who had contributed to this study.

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