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Nurturing innovative employees: effects of organisational learning and work environment

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ABSTRACT

The present study examines the effects of organisational learning and work environment on the formation of employees' innovative work behaviour. A stratified sampling technique was used for the sample of employees at micro and small-scale manufacturing enterprises located in selected cities of the East Coast Economic Region, Peninsular Malaysia. The authors' analysis revealed innovative work behaviour of micro and small manufacturing enterprises at a moderate level. Moreover, the innovative work behaviour at micro-enterprises is significantly lower than small enterprises. The innovation outputs are made up of employees with high innovative work behaviour. Overall, statistical evidence indicated that organisational learning and work environment have a significant influence on the formation of innovative work behaviour. Thus, the micro-small-sized enterprises should raise their employees' innovative work behaviour in order to improve the performance of organisational innovation and competitiveness. Empirical evidence has shown that employees' engagement in innovation is an effective resource for micro-small-sized enterprises to be more innovative.

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1. Introduction

Innovation and adaptation of technologies generated from investment in science and technology are proven to generate productivity and lead to economic growth (Jones, 1995; United Nations, 2002; Waheed, 2012). Therefore, the present and future of national and enterprise success are determined by the culture of innovation and creativity (EPU, 2009, 2010). Dass (2013) and Rosenberg (2004) also portray innovation as playing an important role in driving economic growth; while Bozic (2011) and Moustaghfir and Schiuma (2013) confirm innovation as a way to sustained economic growth and long-term business competitive advantage. Waheed (2012) proposed that innovation capabilities can be enhanced through hiring experts from advanced countries and sending the local labour force abroad for training. However, Zhang, Lim,

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and Cao (2004) strongly recommended that innovation in an organisation must be supported by employee and team learning. In addition, workplace learning organised by companies has proved to stimulate innovation activities (Calantone, Cavusgil, & Zhao, 2002; Jiménez-Jiménez & Sanz-Valle, 2011; Kesting & Ulhøi, 2010; Molina & Callahan, 2009; Sampaio & Perin, 2006; Timmermans, Van Linge, Van Petegem, Van Rompaey, & Denekens 2012; Wang & Ellinger, 2008; Zhang et al., 2004; Žnidaršič & Jereb, 2011). Hence, mastery of knowledge is a primary resource for innovation in any type of organisation (Žnidaršič & Jereb, 2011). Moreover, most organisations have employees with the potential to use their knowledge, skills and ideas for innovation, as Žnidaršič and Jereb (2011) mention. Previous research also indicates that innovation is associated with generation, acceptance and implementation of new ideas in processes, products, services, marketing and management (Baregheh, Rowley, & Sambrook 2008; Damanpour, 1991; Drucker, 2002; Tidd, Besant, & Pavitt, 2001) and is mainly shaped by learning (Baker & Sinkula, 1999; Calantone et al., 2002; Chirico & Salvato, 2008; Garcia-Morales, Moreno, & Llorens-Montes, 2006). In addition, Fang, Fang, Chia-Hui, Yang, and Fu-Sheng Tsai (2011) and Wang and Ellinger (2008) believe that learning at the individual, group and organisation levels is becoming a critical imperative in organisation innovation performance. Therefore, organisational learning will affect organisational performance mainly by facilitating innovation, as Jiménez-Jiménez and Sanz-Valle (2011) conclude. Future research should analyse the effect of industry in the relations between organisational learning and innovation, as recommended by Calantone, Cavusgil, and Zhao (2002) and Jiménez-Jiménez and Sanz-Valle (2011). Further research is also needed to explore the relationship between team learning and implementation of innovations, as proposed by Timmermans, Van Linge, Van Petegem, Van Rompaey, and Denekens (2012). Dharmadasa (2009) advise that research should be done on innovation activities of micro, small and medium enterprises (SMEs) in other countries.

2. Micro, small and medium enterprises innovation in Malaysia

The contribution of SMEs to the Malaysian economy (31.0% of gross domestic product) is relatively lower than in developed countries (Economic Planning Unit, 2009). However, in 2010 SMEs representing 99.2% of all enterprises in Malaysia contributed 56.4% to total employment and 22.0% to exports (Ministry of Finance, 2010). Various incentives were specially designed and implemented to enhance the performance of SMEs. However, the innovation performance for SMEs in particular is not impressive (MOSTI, 2011). The innovation culture in developing countries is still very low (Waheed, 2012). The global innovation index 2014 shows that Malaysia was ranked 33, compared with 31 in 2012 and 28 in 2010 (Dutta, 2012; Dutta, Lanvin, & Wunsch-Vincent, 2014). This shows Malaysia's innovation performance has declined compared with other countries and is lower than Switzerland (1), Japan (21), Hong Kong (10) and Korea (16) (Dutta, Lanvin, & Wunsch-Vincent, 2014). In terms of innovation output index, Malaysia was ranked 30 and creative output was ranked 52 (Dutta, 2012). Malaysia should not rely on building adaptive capacity and the use of imported technology; more important is the development of new technology locally

(Malaysia, 1996; World Bank, 2010). Investment in capital and technology with high added value, especially in the industrial and services sectors, should be developed further in order for Malaysia to become a high-income nation (Prime Minister's Department, 2011). Therefore, the economic growth strategy has now shifted to advancement of science and technology (Malaysia, 2002; Prime Minister's Department, 2011; Smith, 2006). Yet, the innovation efforts by manufacturing firms are more towards upgrading an existing product line, machinery and equipment rather than new technology, and lag behind other countries mainly in the region (World Bank, 2010). Meanwhile, the ability of local workers in services negotiation, local design and engineering is still limited (Malaysia, 1991; World Bank, 2010). Investments in human capital should keep increasing in order to enhance workforce talents on product, process and organisational innovation for raising the quality, standards and productivity. Local researchers (Chin, 2010; Subrahmanya, Mathirajan, & Krishnaswamy, 2010; Talebi & Tajeddin, 2010) have identified that innovation is one of the business strategies for local SMEs to remain competitive in the global market. Previous empirical evidence (such as Ancona & Caldwell, 1987; Janssen & Van Yperen, 2004; Kanter, 1988; Oldham & Cummings, 1996; Scott & Bruce, 1994; Yuan & Woodman, 2010) also confirmed that employee innovative work behaviour is important in helping the organisation to be competitive. Innovation is no longer dominated by the management and scientists, but ideas, new products and processes can emerge from their subordinates (Kesting & Ulhøi, 2010). How SMEs in Malaysia develop their innovation capacity through systematic employee-driven innovation and workplace learning with favour the daily work environment.

3. Literature review and hypotheses

3.1. Innovative work behaviour

Innovative work behaviour (IWB) was initially derived from the Latin, where '*innovare*' means making something 'new' (Tidd et al., 2001). Schumpeter (1934) described innovation as the creation and implementation of '*new combination*'. This new combination may be associated with new products and services, processes, markets, delivery systems and policies. Innovation not only creates added value to the firm itself, but also to other stakeholders and the community. Most definitions of innovation include the development and implementation of the '*something new*'. According to Zimmerer and Scarborough (2005), innovation is the ability to apply creative solutions to problems and opportunities to improve and enrich people's lives. In other words, innovation means the opportunity for employees to transform an idea that can be marketed. Thompson and Fine (1999) define innovative work behaviour as receiving, generating and implementing new ideas, processes, products or services. According to West and Farr (1989), innovative work behaviour is the result of individual behaviour in introducing and applying the '*new*' things that benefit the organisation at various levels. De Jong and Den Hartog (2007) define innovative work behaviour as idea generation and idea applications in individual tasks, by

groups, or by the organisation. Innovation can be generated by exploring opportunities, and identifying performance gaps or proposed solutions to a problem. The opportunities to generate new ideas within the organisation will affect customer satisfaction and improve organisational performance. Innovative work behaviour is a multi-dimensional aspect of employee behaviour. Scott and Bruce (1994) and Janssen (2000) state that innovative work behaviour is often associated with the phases of the innovation process. Kanter (1988) outlined a three-dimensional behaviour of generating innovative ideas, combinations of ideas and implementation of ideas. De Jong and Den Hartog (2010) categorised innovative work behaviour into four dimensions: exploration of ideas, idea generation, championing the idea and implementation of the idea. Kleysen and Street (2001) gave five dimensions: opportunities exploration, idea generation, formative investigation, championing the idea and implementation of the idea. It is concluded that innovative work behaviour is the process of exploring new ideas through to realisation of the idea. Therefore, innovative work behaviour is behaviour that directly and intentionally aims to change something by creating different conditions, as mentioned by Batteman and Grant (1999).

3.2. Organisational learning and innovation

Human behaviour can be shaped by the learning process and capabilities being upgraded and complemented (Naudé & Szirmai, 2012). This coincides with Suliyanto and Rahab (2012), who analyse the relationship of learning and innovation that serves as a key success factor in technology-intensive firms. Lemon and Sahota (2004) stated that learning plays an important role in ensuring knowledge is constantly replenished and updated to allow an appropriate work behaviour to changes in the competitive environment. Current digital economics and business require the creation, sharing and application of knowledge and expertise (Brockman & Morgan, 2003). Lemon and Sahota (2004) also proved that mastery of knowledge can increase the capacity for innovation and is increasingly recognised as a key resource for innovation. It was concluded by Amara, Landry, Becheikh, and Ouimet (2008) that learning is a factor that directly affects innovation. According to Hurley and Hult (1998), learning-oriented organisational culture has a tendency to stimulate acceptance of new ideas. This is depicted by Alegre and Chiva (2008) as an action-based innovation capacity to introduce and implement new ideas. Learning with teamwork activities will foster collaboration and sharing of ideas to improve cross-profession and cross-departmental collaboration (Sampaio & Perin, 2006). In addition, in workplace training programmes by companies, individual and team learning has proved to stimulate innovation activities (Calantone, Cavusgil, & Zhao 2002; Jiménez-Jiménez & Sanz-Valle, 2011; Sampaio & Perin, 2006; Timmermans, Van Linge, Van Petegem, Van Rompaey, & Denekens, 2012; Zhang, Lim, & Cao, 2004; Žnidaršič & Jereb, 2011). Hence, mastery of knowledge is a core resource for innovation in any type of organisation (Patterson et al., 2011; Žnidaršič & Jereb, 2011). As a result, learning in organisations is a variable for firms to introduce new products and processes, and to penetrate new markets.

Hypothesis 1: Individual, team and organisational learning activities will be positively associated with innovative work behaviour.

3.3. Work environment and innovation

The work environment that encompasses the organisational work commitment (Hassan, 2010), teamwork (Perdomo-Ortiz et al., 2009), job satisfaction (Lee, Wong, Foo, & Leung, 2011), inside and outside networks (Carmeli & Spreitzer, 2009), employees' incentives, empowerment and skills (Cordero, Walsh, and Kirchhoff (2005) is conducive to the innovation activities, especially among employees. Innovative behaviour among retailers is positively related to affective commitment and negatively related to continuance commitment (Hassan, 2010). Perdomo-Ortiz et al. (2009) found positive effects of teamwork on technological innovation. Carmeli and Spreitzer (2009) found that trust, thriving and connectivity have interlinkages with innovative work behaviours. The individual's innovation behaviour is strengthened by a supportive work environment (Lee, Wong, Foo, & Leung, 2011). The work environment that encompasses top management commitment (Hassan, 2010), teamwork (Perdomo-Ortiz et al., 2009), job satisfaction, inside and outside networks (Carmeli & Spreitzer, 2009), employees' financial and non-financial incentives (Cordero, Walsh, & Kirchhoff, 2005; Lee, Wong, Foo, & Leung, 2011) and empowerment (Cordero et al., 2005) is a precedent of the innovation activities, especially among employees. Such activities produced by creative individuals and groups of individuals in organisations send a key message to managers. Therefore, they should promote and support innovative championing and consider how they can adjust existing schemes of incentives and rewards accordingly.

Hypothesis 2: A supportive work environment will be positively associated with innovative work behaviour.

3.4. Enterprise scale and innovation

The dynamic of exploring the innovativeness among the SMEs still moving towards multi-dimensional (Cobbenhagen, 1999; Hazana Abdullah, Lee Ping, Wahab, & Shamsuddin, 2014; Van de Ven, 1986). However, there are differences of innovation between SMEs and large companies (Bertschek & Entorf, 1996; White, Braczyk, Ghobadian, & Niebuhr, 1988; Wolf, Kaudela-Baum, & Meissner, 2012). MOSTI (2011) found that the majority of small companies in Malaysia are not innovative. Ishak and Omar (2013) found that most small companies focus on administrative innovation, incremental innovation and products innovation; while Avermaete, Viaene, Morgan, and Crawford (2003) found no difference in product or process innovation among micro and small enterprises. Yet, Forsman and Rantanen (2011) found that small companies are more innovative because they are more flexible, adaptable and hasty in implementing the changes. Wolf et al. (2012) stated that SMEs are better in the innovation process than large companies because they are more flexible and faster to adapt to market fluctuations. In contrast, large companies are sluggish in responding to new opportunities and customer needs. A capital-intensive innovation is more likely to occur in small companies and low investment is more common among micro-enterprises (Avermaete et al., 2003). However, Bertschek and Entorf (1996) and Forsman and Rantanen (2011) found that small and large companies are more innovative than medium-sized companies. This finding is consistent

with White et al. (1988) for small companies benefiting from individualism while larger companies benefit from the resources and systems. In fact, Wolf et al. (2012) found that small companies have their own unique innovations. Ishak et al. (2015) also found that innovation activities among small companies in halal food manufacturing were still at an initial stage, trapped by financial and skills constraints. In summary, lack of innovation among SMEs is due to there being less market pressure, limited outsourcing of innovation, lack of knowledge and interdependence with peers of other businesses (Potocan & Mulej, 2009). Therefore, SMEs have to desire the innovation of their employees.

Hypothesis 3: Scale of production will be positively associated with innovative work behaviour.

4. Methods

The term SME covers a wide range of definitions and measures, varying from country to country. In this study we used Malaysian SMEs (MSME) measure. Malaysian SMEs were grouped into three categories: micro, small or medium enterprises. These categories are based on the number of full-time employees. In the Malaysian manufacturing companies, micro-enterprise is categorised as fewer than 5 full-time employees and small enterprise as between 5 and less than 75 full-time employees (SME Corp., 2012). The study was undertaken at three cities, namely: Kuantan (Pahang), Kuala Terengganu (Terengganu) and Kota Bharu (Kelantan) in the East Coast Economic Region (ECER), Malaysia. ECER is an economic development corridor established in 2007 to generate socio-economic transformation of the east coast Peninsular Malaysia. There are multi-attractive incentives such as tax exemption for pioneer status, investment tax allowances, tax exemption on royalty and technical fees, and availability of basic infrastructure to attract foreign direct investment and strengthen SMEs innovation performance (ECERDC, 2012). Based on the listed company directory in the SME Development Corporation/SME Corp., only micro- and small-scale manufacturing companies were established in study areas and the total number of full-time employees is 786. Hence, in June–September 2013 a survey questionnaire was distributed to the 260 employees as a sample size at all 44 micro- and small-scale manufacturing companies (listed in SME Development Corporation/SME Corp). Only 90.4% (235) of the employees provided reliable feedback via the survey form. The survey questionnaire was distributed at the company and respondents were guided to answer the questions. For each question, respondents were asked to circle the response which best described their degree of agreement. The study involved three main constructs: organisational learning, work environment and innovative work behaviour. (1) Organisational learning was operationalised using individual learning, group learning and organisational structured learning adapted mainly from the Mikkelsen and Grønhaug (1999) learning climate and assimilated with previous tested survey questionnaires (Caldwell & O'Reilly, 2003; Chan, Lim, & Keasberry, 2003; Ingram, 2004; Jiménez-Jiménez & Sanz-Valle, 2011; Mackenzie, 1995; Patterson, 2002; Scott & Bruce, 1994; Strating & Nieboer, 2010; Tohidi, Seyedaliakbar, & Mandegari, 2012). (2) The work environment was measured using leadership

inspiration, employee empowerment, reward and recognition, invention facilities and risk taking. Work environment was based upon the study on organisational climate by Quinn and Rohrbaugh (1983), combined with previous tested items (such as Cantwell, 2012; Janssen, 2004; Oldham & Cummings, 1996; Patterson, Warr, & West 2005; Spreitzer, 1995). (3) Exploration, generalisation, formative investigation, championship and implementation of the idea were used to measure IWB. The items used to measure the IWB phase were based on De Jong and Den Hartog (2008, 2010) and Kleysen and Street (2001). These constructs were adapted from standard instruments, blended with previous studies to ensure validity and tested for reliability (α above 0.93). All items were measured on a five-point Likert scale, anchored by 1: strongly disagree and 5: strongly agree. After pre-testing the measures, these items were modified to fit the context studies. Linear multiple regression analysis has been carried out to test the above hypotheses and analyse the effect of organisational learning-related indicators, work environment indicators and employee personal factors on employees' innovative work behaviour. A stepwise multiple regression technique was performed to investigate the significant determinant variables on employees' innovative work behaviour.

5. Results

5.1. Employees' background

Overall, the employees were 45.9% male and 54.1% female. This study found that the majority of workers were permanent staff (76.9%). Only 12.9% were contract employees and 10.2% were temporary workers. The minimum age was 17 years, while the maximum was 66 years and the mean age was 34 years. The majority of employees (32.3%) were aged 26–35 years, followed by those aged less than 25 years (27.9%). Only 3.5% of the employees were above 56 years old. The minimum work experience was 6 months, maximum 52 years with an average work experience of 9 years. In total, 47.7% had 2–7 years' experience and 28.8% had more than 11 years' experience. A total of 31.0% held a Bachelor degree and 28.3% had PMR (lower secondary assessment), SPM (Malaysian certificate of education) and STPM (Malaysia high school certificate) qualifications. Only 10.0% of the employees had Masters and PhD qualifications. Overall, the majority of employees (49.8%) received a gross salary of less than Malaysian ringgit (MYR)1000 per month. This was followed by 33.6% who received a gross salary of MYR1001–2000. Only 10.6% of the employees received a gross salary between MYR2001 and MYR3000 per month. In total 47.6% worked at the headquarters, followed by 21.0% in a subsidiary company and 10.5% in a branch company. Almost 83.0% worked in small enterprises (fewer than 5 employees) and 17.0% in micro-scale companies (5–75 employees). In terms of industries, 55.3% worked in the food and beverage industry compared with other industries (see Table 1).

5.2. Innovative work behaviour and invention

Table 2 shows the employees' performance in each dimension of innovative work behaviour. Innovative work behaviour for idea exploration was considered at a higher

Table 1. Employees' background and industry.

	Frequency	%
Academic qualification ¹		
Primary school	27	11.8
Secondary and high school	68	19.6
Technical certificate and diploma	21	9.2
Bachelor degree	71	31.0
Masters and PhD	23	10.0
Other	19	8.3
Monthly gross salary		
Less than MYR1000	117	49.8
MYR1001–2000	79	33.6
MYR2001–3000	25	10.6
More than MYR3001	14	5.0
Types of industry	Micro-enterprise employee	Small-enterprise employee
Food and beverage	23 (57.5%)	107 (54.9%)
Textiles and apparel	0 (0%)	19 (9.7%)
Wood, furniture and crafts	3 (7.5%)	35 (17.9%)
Chemicals and pharmaceuticals	3 (7.5%)	19 (9.7%)
Electricity, electronics and machinery	2 (5%)	7 (3.6%)
Non-metallic mineral products, basic metals and others	9 (22.5%)	8 (4.1%)

Note: Micro-enterprise=fewer than 5 full-time employees, small enterprise=from 5 to less than 75 full-time employees.

¹Six missing data.

Source: Fieldwork.

level, while the idea-generating attributes, formative enquiry, championing the idea and implementing new ideas were at a moderate level. The overall innovative work behaviour among employees at these enterprises was at a moderate level. In terms of distribution, 52.8% of them are classified with a high level of innovative work behaviour, 32.3% a moderate level and the rest are low. The innovative work behaviour will generate innovative output; however, only 4.8% of them apply for new patents, with an average of 12 patents a year, 4.8% presented papers at international events and 3.0% gained innovation awards (average eight awards). The lowest innovative output was patent approved (1.7%) and invitation as an expert (1.3%). This study also found the ability of exploration of new ideas among employees at micro-enterprises almost parallels small enterprises. Table 2 shows the capability of generating new ideas among employees in small enterprises is significantly higher than employees at the micro-scale enterprises. Similarly, the activity of formative investigation and implementing new ideas among employees of small-scale enterprises is also better than in micro-enterprises. However, there was no significant difference between enterprises in the employee capability of championing new ideas. *t*-Test results in Table 3 show that the overall innovative work behaviour at micro-enterprises is slightly lower than at small-scale enterprises. The innovative capabilities among employees at small-scale enterprises are higher than at micro-enterprises except for exploration and championing of ideas. Harris, Rogers, and Siouclis (2003) also found that relatively large companies are more likely to innovate. Smaller firms, in particular, had huge success in introducing new products, while larger firms focused on incremental development of existing products.

Table 4 shows a comparison of innovation output produced by employees of micro and small enterprises. The results indicated only 5% of employees within micro-enterprises submitted an application for new patents compared with 10.2% of employees in small enterprises. In terms of invitation as an expert, 16.9% among employees in

Table 2. Employees' innovative work behaviour performance.

Dimension	Item	Mean	Std deviation	Level
Idea exploration	2	3.81	0.857	High
Generating new ideas	3	3.65	1.035	Moderate
Formative enquiry	3	3.35	1.168	Moderate
Idea championing	3	3.41	1.150	Moderate
Idea realisation	3	3.36	1.127	Moderate
Overall	14	3.49	0.957	Moderate

Note: Mean classification; 1.00–2.32 = low, 2.33–3.66 = moderate, 3.67–5.00 = high. Source: Fieldwork.

small enterprises compared with 12.5% of employees in micro-enterprises. Only employees at small-scale enterprises gained an innovation award (7.7%), published articles in international journals (4.1%) and presented articles at international conferences, workshops or discussion groups (4.1%).

5.3. Determinants of innovative work behaviour

This model is based on previous models by Camison (in Vieites & Calvo, 2011), Vargas Hernandez, and Medrano (2006) and Vieites and Calvo (2011). Organisational learning influences the nurturing of employees' innovative work behaviour. In addition, other factors that influence the formation of employees' innovative work behaviour are workplace environment and personal factors. Calantone, Cavusgil, and Zhao (2002), King and Anderson (1995), Sun Rui and Jintao (2007) and Shrivastava (1993) point out that individual, group and organisation learning are important factors to drive innovation in the organisation. Those who are involved in the invention need to have features including creative thinking, caution, problem solving, self-reliance and self-discipline (Sun Rui & Jintao, 2007). As a result, most organisations today are working to improve their employees' innovation capabilities. Innovation can be a new product, process, marketing technique and management generated from new knowledge or a combination of existing and new knowledge (Kogut & Zander, 1992; Therin, 2010). Therefore, Therin (2010) emphasised that mastery of knowledge is the basic input in the organisation, so organisational learning is the process of adding value to the knowledge that creates the innovative worker's work. In addition, Vargas Hernandez, and Medrano (2006) state that the work environment also influences the formation of employee innovative work behaviour. In fact, Zhang and Duan (2010) found that the work environment had a positive and significant impact on the nurturing of innovative work behaviour. The work environment variables in this study include leadership stimulus (De Jong & Den Hartog, 2007), employee empowerment, rewards and recognition (Eisenberger & Cameron, 1996; Janssen, 2004) and risk takers (Eisenberger & Cameron, 1996; Janssen, 2000). In term of personal factors, Messmann, Mulder, and Gruber (2010) and Amabile (1997) reported a positive impact of employee job experience on innovative work behaviour. However, Leong and Rasli (2014) found that employee educational level has no significant impact on innovative work behaviour.

The estimating regression equations are expressed as follows:

$$IWB = f(\text{organizational learning, work environments, personal factors}, \mu) \quad (1)$$

Table 3. Comparison of innovative work behaviour.

Dimension	Enterprise scale	N	Mean	Std deviation	df	t	Sig.
Idea exploration	Micro-enterprise employee	40	3.8250	0.84391	232	0.088	0.930
	Small-enterprise employee	194	3.8119	0.86193			
Idea generating	Micro-enterprise employee	40	3.1500	0.86050	232	3.449	0.001***
	Small-enterprise employee	194	3.7560	1.03981			
Formative enquiry	Micro-enterprise employee	40	2.7250	1.14202	233	3.815	0.000***
	Small-enterprise employee	195	3.4769	1.13414			
Idea championing	Micro-enterprise employee	40	3.3917	1.18607	233	0.101	0.919
	Small-enterprise employee	195	3.4120	1.14602			
Idea realisation	Micro-enterprise employee	40	2.9583	1.17715	233	2.504	0.013**
	Small-enterprise employee	195	3.4427	1.10165			
Overall	Micro-enterprise employee	40	3.1661	0.84707	233	2.373	0.018**
	Small-enterprise employee	195	3.5564	0.96655			

Note: Mean classification; 1.00–2.32 = low, 2.33–3.66 = moderate, 3.67–5.00 = high.

Micro-enterprise = fewer than 5 full-time employees, small enterprise = from 5 to less than 75 full-time employees.

Significant.

* $p < 0.1$, ** $p < 0.05$ and *** $p < 0.01$.

Source: Fieldwork.

$$IWB = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \mu \quad (2)$$

Dependent variable: innovative work behaviour (*IWB*)

Independent variables:

X_1 (individual learning)	X_5 (empowerment)	X_9 (experience)
X_2 (group learning)	X_6 (reward)	X_{10} (enterprise scale)
X_3 (structure learning)	X_7 (facilities)	X_{11} (educational level)
X_4 (leadership)	X_8 (risk)	

Table 5 shows that the organisational structure learning ($\beta = 0.629$, $p < 0.01$) showed a significant and positive influence on the behaviour of innovation work. However, the attributes of individual and group learning do not show significant inspiration in the formation of employees' innovative work behaviour. In terms of the work environment within the organisation, it was found that empowerment, rewards and recognition and facilities for invention activities do not have an effective contribution to nurturing employees' innovation work behaviour. However, only the attributes of risk taking ($\beta = 0.182$, $p < 0.05$) and organisational stimulation leadership ($\beta = 0.233$, $p < 0.01$) have a positive and significant influence on the formation of innovative work behaviour. Therefore, the employee's willingness to take risks potential will enhance the ability of innovation by 18.2%. In terms of personal factors, work experience and the highest level of education are not significant. The overall tested model showed that organisational learning dimension (individual, group and structure learning) and work environment dimension (leadership, empowerment, reward, facilities and risk) partially have positive and significant impacts on the formation of employee innovative work behaviour, shown in Table 5.

6. Conclusion and discussion

In line with productivity and competitiveness of SMEs in Malaysia, employees' innovative work behaviour needs to be nurtured. Our study shows that innovative

Table 4. Comparison of individual innovation output.

Innovation output	Enterprise scale	Frequency (%)
New patent application	Micro-enterprise employee	2 (5%)
	Small-enterprise employee	20 (10.2%)
Invitation as an expert	Micro-enterprise employee	5 (12.5%)
	Small-enterprise employee	33 (16.9%)
Innovation award	Micro-enterprise employee	0 (0%)
	Small-enterprise employee	15 (7.7%)
International journal article	Micro-enterprise employee	0 (0%)
	Small-enterprise employee	8 (4.1%)
International conference/forum/workshop/dialogue	Micro-enterprise employee	0 (0%)
	Small-enterprise employee	8 (4.1%)

Source: Fieldwork.

Table 5. Determinants of employees' innovative work behaviour.

	β	Std error	<i>t</i>	Sig.	Tolerance	VIF
Constant	-0.500	0.338	-1.482	0.140		
X_3 (structure learning)	0.629	0.107	5.880	0.000***	0.591	1.693
X_4 (leadership)	0.233	0.090	2.584	0.010**	0.536	1.866
X_8 (risk)	0.182	0.083	2.186	0.030**	0.628	1.592
R^2	0.384					
<i>dF</i>	3					
<i>F</i>	48.093					
<i>p</i>	0.0000***					
<i>n</i>	235					

Source: Fieldwork.

*Significant at $p < 0.1$, ** $p < 0.05$ and *** $p < 0.01$.

work behaviour among employees in micro and small manufacturing enterprises is at a moderate level and innovation output is still limited. Moreover, small-scale enterprises have better innovative employees than micro-enterprises as well, as conveyed by Forsman and Rantanen (2011). Small-scale enterprises are more likely to innovate, especially for the export markets, while micro-enterprises focus on local and domestic markets, as described by Harris, Rogers, and Siouclis (2003). This empirical evidence also confirmed that organisational structured learning is the dominant predictor for the formation of employees' innovative work behaviour. Fostering innovative work behaviour by engagement of the learning culture was confirmed by previous research (such as Cabello-Medina, Carmona-Lavado, & Valle-Cabrera, 2005; Lin & Chen, 2006; Mumford, 2000; Rhee, Park, & Lee, 2010). The learning activities stimulate knowledge sharing, applying and updating the new knowledge to generate creative ideas (Kesting & Ulhøi, 2010; Wang & Ellinger, 2008) and spark new ideas for strengthening business strategy (Menon & Varadarajan, 1992; Smith, Ulhøi, & Kesting, 2012). Knowledge and skills also accumulated in the organisation, which led to the firm's innovation capability being used to learn something new and apply it through invention. The conducive workplace environments that enable employees to take risks are more likely to generate innovative work behaviour in line with Swedish enterprises' experience (Vanyushyn, 2011). This study has also recognised transformational leadership as a positive influence on organisational innovation performance, which was contributed by their employees. The intellectual stimulation and inspiring ideas from a company's leadership intrinsically motivate employees to think, search

for solutions and promote their creativity (Jung, Chow, & Wu, 2003; Sosik, Kahai, & Avolio, 1998; Tierney, Farmer, & Graen 1999). Large enterprises are more highly innovative than micro, small and medium enterprises (Acs & Audrestsch, 1988; Schumpeter, 1942) because they have more scientific and research workers. However, our findings enrich the current view that the enterprise scale (firm's size) is an insignificant predictor of the innovative works behaviour (Avermaete et al., 2003; De Jong & Den Hartog, 2008), but are inconsistent with the recent empirical evidence of Moohammad et al. (2014) and Nicholas (2015). Considering that innovative work behaviour potentially increases the innovation performance of SMEs, top management executives should strive to raise the innovative work behaviour among their employees. The results of this study suggest that the management of SMEs should, first, enhance investment in employees' talent and the development of their capabilities, and, second, encourage risk taking among innovative employees with support and rewards from the company, and adopting innovation-oriented leadership. Therefore, employee-driven innovation is a mechanism to remain competitive and survive in the long run.

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