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Entrepreneurial Leadership Behaviour among School Principals: Perspectives from Malaysian Secondary School Teachers

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ABSTRACT

Entrepreneurial leadership is a particular leadership behaviour that enables leaders to face the challenges of their tasks and roles in the current environment of organisations. Education scholars believe that this type of leadership empowers educational leaders to meet the diverse needs of students as well as the ever-changing demands of the school environment. However, many questions have been raised on how to measure entrepreneurial leadership behaviour in educational settings and in particular among school principals. The main purpose of this study was to determine Malaysian secondary school principals' entrepreneurial leadership behaviour through teachers' perspectives using the Entrepreneurial Leadership Questionnaire. A total sample of 300 school teachers were asked to rate the frequency of entrepreneurial leadership behaviour in their school principals. The data was analysed using Structural Equation Modelling. The results indicated that the questionnaire is highly valid and reliable to measure school principals' entrepreneurial leadership behaviour. Furthermore, entrepreneurial leadership is a multi-dimensional construct that can be explained by five leadership behaviours including general entrepreneurial leader behaviour, explorer behaviour, miner behaviour, accelerator behaviour and integrator behaviour. Implications of the findings are also discussed in this paper.

Keywords: Entrepreneurial leadership, leadership behaviour, school principals, school teachers, Malaysia

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INTRODUCTION

Entrepreneurial leadership has been defined as a particular type of leadership behaviour that enables leaders to face the increasing challenges of their tasks and roles in

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the current organisational environment (Hentschke, 2009; Gupta *et al*., 2004). This leadership style assists leaders in directing people to achieve their vision and overcoming obstacles in different stages of organisational growth as well as the challenges and crises found in the organisation environment (Chen, 2007; Swiercz & Lydon, 2002). Entrepreneurial leaders, therefore, can more successfully recognise new opportunities to improve their organisation's performance (Chen, 2007; Okudan & Rzasa, 2006; Gupta *et al*., 2004). The fundamental impact of entrepreneurial leadership behaviour on improving leadership effectiveness and organisational performance has received increasing attention by education scholars in order to improve various aspects of education and specifically school leadership (Xaba & Malindi, 2010; Berglund & Holmgren, 2006; Collins *et al*., 2004; Eyal, & Kark, 2004; Eyal & Inbar, 2003).

Yet, there has been ongoing debate on how to measure entrepreneurial leadership behaviour among educational leaders (Yusof, 2009). The majority of previous studies on entrepreneurial leadership have been conducted qualitatively (e.g., Leitch *et al*., in press; Kempster & Cope, 2010; Xaba & Malindi, 2010; Gupta *et al*., 2004). Furthermore, prior research only measured limited aspects of educational leaders' entrepreneurial leadership behaviour (Yusof, 2009). In response, this study aims to measure different dimensions of principals' entrepreneurial leadership behaviour through teachers' perspectives. This paper describes the differences and similarities between entrepreneurial leadership and other leadership behaviour. It highlights the advantages of entrepreneurial leadership for school leadership and performance improvement and specifies the organisational and environmental demands that necessitate application of entrepreneurial leadership principles by school leaders. Subsequently, the research method and measurement model used for entrepreneurial leadership are presented. Finally, the study's findings are discussed with regard to the implications for developing entrepreneurial leadership research and practice in schools.

How Is Entrepreneurial Leadership Different from Other Types of Leadership Behaviour?

Entrepreneurship scholars have highlighted the differences between entrepreneurial leaders and other leaders in three domains. First, entrepreneurial leaders possess inherent characteristics that differentiate them from other leaders and motivate and enable them to enter the challenging process of leading entrepreneurial activities (Chen, 2007; Kuratko, 2007; Fernald *et al*., 2005; Gupta *et al*., 2004; Nicholson, 1998). Entrepreneurial characteristics which are most referred to with respect to both entrepreneurial leaders and organisations are innovativeness, proactiveness and risk taking (Chen, 2007; Kuratko, 2007; Gupta *et al*., 2004; Covin & Slevin, 1991). Innovativeness is the ability and tendency of entrepreneurial leaders to think creatively and develop novel and practical ideas for improving the performance of the organisation, using

resources more effectively and solving problems constructively (Chen, 2007; Rae, 2007; Gupta *et al*., 2004). Proactiveness is the entrepreneurial leaders' capability to envision and lead toward the future rather than passively waiting to be affected and challenged by it. This trait enables entrepreneurial leaders to recognise new opportunities for entrepreneurial activities and take action to exploit the opportunities (Kuratko *et al*., 2007; Kuratko & Hornsby, 1999). It highly enhances entrepreneurial leaders' creativity, desire and intention to initiate entrepreneurial activities and their perseverance in their vision attainment (Zampetakis, 2008; Kuratko *et al*., 2007; Kickul & Gundry, 2002). Finally, entrepreneurial leaders have a strong tendency towards risk taking despite the presence of costly failures (Chen, 2007; Zhao *et al*., 2005; Mueller & Thomas, 2000). However, having the innate characteristics of an entrepreneurial leader is not sufficient to be successful in leading entrepreneurial activities (Gupta *et al*., 2004; Swiercz & Lydon, 2002).

Second, entrepreneurial leaders lead in highly complex and demanding economic and competitive situations (Hentschke, 2009; Fernald *et al*., 2005; Cogliser & Brigham, 2004; Vecchio, 2003). These leaders start entrepreneurial activities from the very beginning and in highly turbulent and uncertain environments (Gupta *et al*., 2004; Swiercz & Lydon, 2002). They are competent in overcoming the challenges and crises in the environment (Vecchio, 2003; Swiercz & Lydon, 2002). Finally, the process of leaders' influence on followers to enact their vision is different for entrepreneurial leaders because they need to mobilise and direct a group of competent and competitive people and capitalise on their creativity and innovativeness in order to maintain the sustainability of their entrepreneurial activities (Chen, 2007; Gupta *et al*., 2004). Various factors such as personal characteristics, organisational and task performance demands and environmental factors affect the process of influencing followers that makes leadership as a highly challenging role for entrepreneurial leaders (Leitch *et al*., in press; Kempster & Cope, 2010; Kempster, 2009, 2006).

Despite these differences, however, there are also key similarities between entrepreneurial leadership and the terms that construct the concept: entrepreneurship and leadership. For example, Fernald *et al*. (2005) argue that most of the tasks and roles of entrepreneurs are leadership-based and Cogliser and Brigham (2004) emphasise that organisational leaders require entrepreneurial competencies to deal with the difficulties and impediments in the environment of current organisations. Specifically, scholars argue that entrepreneurial leaders' competencies in anticipating the future, exploring new opportunities, creating novel ideas and providing an environment for staff that encourages and supports generating and implementing new ideas help organisational leaders face problems and achieve their vision (Burns, 2005; Gupta *et al*., 2004). Through an integrating approach to leadership and entrepreneurship, Roomi

and Harrison (2011) have recently defined entrepreneurial leadership as "having and communicating the vision to engage teams to identify, develop and take advantage of opportunity in order to gain competitive advantage" (p. 2). Thornberry (2006) combined three types of leadership styles including transformational, transactional and charismatic leadership to better explain entrepreneurial leadership behaviour both at personal and organisational levels. He emphasised that entrepreneurial leaders need to be innovative and proactive and need to take risks and practice entrepreneurial approaches in performing their leadership tasks and roles. Although previous research does shed some light on entrepreneurial leadership as an emerging paradigm, there is still limited knowledge on how educational leaders can apply such leadership to enhance their leadership effectiveness and consequently, improve their school performance (Xaba & Malindi, 2010; Berglund & Holmgren, 2006). The next section of this paper discusses the benefits of entrepreneurial leadership for school principals and the environmental constraints that compel principals to perform their tasks like an entrepreneurial leader.

How Does Entrepreneurial Leadership Help School Principals?

Scholars argue that entrepreneurial leadership can assist school principals to meet the diverse needs of students and ever-changing demands of the school environment in three important ways. First, entrepreneurship in general and entrepreneurial leadership in particular is a way of thinking and lifestyle rather than merely establishing and leading a new business (Kuratko, 2007; Klein & Bullock, 2006; Hytti & O'Gorman, 2004). In this respect, entrepreneurial leadership principles and approaches can be applied in all aspects of education including school leadership through influencing the leaders' behaviour and task performance as well as their capability to look above and beyond current school status and explore new opportunities for school improvement (Berglund & Holmgren, 2006; Eyal & Kark, 2004). By acquiring and practising entrepreneurial leadership approaches in their school leadership task performances, principals can improve their school effectiveness and prepare an appropriate environment that facilitates teaching and learning (Mohd Sahandari *et al*., 2009). Second, researchers highlight the advantages of entrepreneurial leadership for organisational performance improvement and, specifically, for creating the required changes and innovations in the organisation (Holt *et al*., 2007, Kuratko *et al*., 2007; Gupta *et al*., 2004; Swiercz & Lydon, 2002; Kuratko & Hornsby, 1999). In this sense, educational leaders apply entrepreneurial leadership to enhance organisational innovation in educational settings (Yusof, 2009). To be specific, school principals implement entrepreneurial leadership approaches such as developing new ideas and exploring opportunities to improve schools' educational environment in order to foster the process of required changes and innovations in the school performance (Eyal

& Kark, 2004; Eyal & Inbar, 2003). Previous research emphasised the influential impact of applying entrepreneurial leadership on different aspects of performance improvement in educational settings (Xaba & Malindi, 2010; Yusof, 2009). For example, findings of Yusof's (2009) research suggested a significant relationship between entrepreneurial leadership behaviour of Malaysian research universities' leaders and organisational innovations in the universities.

Furthermore, educational leaders can gain great benefits from entrepreneurial leadership approaches and principles in dealing with various challenges and constraints imposed by the educational environments (Xaba & Malindi, 2010). Hentschke (2009) emphasised that school principals are facing the challenge of improving the quality of education for larger populations of students at public schools and exploring creative and innovative ways to increase school resources. In addition, rapid changes in the environment coupled with a variety of factors that affect school performance and the urgent need for equipping students for their highly competitive future add to the complexities and challenges that school principals are required to deal with (Morris *et al*., 2007; Eyal & Kark, 2004; Eyal & Inbar, 2003). In order to overcome these challenges and difficulties, school principals need to purposefully practise entrepreneurial leadership (Xaba & Malindi, 2010).

How Can We Measure Entrepreneurial Leadership?

Previous studies on entrepreneurial leadership have been predominantly conducted through qualitative methods of inquiry (Leitch *et al*., in press; Kempster & Cope, 2010; Xaba & Malindi, 2010; Swiercz & Lydon, 2002). In fact, quantitative research that measures different dimensions of the construct is scarce specifically in the educational contexts. Prior research has measured limited aspects of educational leaders' entrepreneurial leadership behaviour (Yusof, 2009). This is partially because entrepreneurial leadership as a distinctive type of leadership behaviour has recently emerged in the literature and the theoretical and conceptual foundations of the notion is in the early stages of development (Leitch *et al*., in press; Kempster & Cope, 2010; Gupta *et al*., 2004; Swiercz & Lydon, 2002). Moreover, there is no well-established measurement model for the concept (Thornberry, 2006). Eyal and Inbar (2003) developed an inventory to measure principals' entrepreneurial approaches at elementary schools. The inventory estimates the extent of innovations and initiations implemented by the principals and the changes the innovations created in the school performance. The inventory only contains principals' innovativeness and proactiveness and does not include risk taking for two important reasons as Eyal and Inbar highlighted. First, according to Lumpkin and Dess (1996), risk taking does not have a linear function in organisations.

Second, principals' freedom to take risks is limited in centralised education systems. The inventory consisted of 14 items on how school principals practise entrepreneurial leadership approaches in leading their schools.

More recently, Thornberry (2006) integrated transformational, transactional and charismatic leadership to develop a theoretical foundation for entrepreneurial leadership that explains such leadership behaviour at both personal and organisational levels. Thornberry proposed a multi-dimensional framework that measured how entrepreneurial leaders use their innovativeness, proactiveness and risk taking capacities to perform their tasks. He developed the Entrepreneurial Leadership Questionnaire (ELQ), which assesses organisational leaders' entrepreneurial leadership behaviour using 50 items. The questionnaire measures entrepreneurial leadership behaviour in five dimensions including general entrepreneurial leader behaviour, explorer behaviour, miner behaviour, accelerator behaviour and integrator behaviour. General entrepreneurial behaviour reflects one's ability to apply an entrepreneurial approach at work and provide an encouraging and supportive environment for staff to be innovative and take risks in performing their tasks and persist in the face of problems and quickly change the strategies that might not be effective. Explorer behaviour is the entrepreneurial leaders' action in discovering new opportunities for the organisation's development, developing creative strategies for the organisation's performance improvement and envisioning an innovative future for the organisation. Miner behaviour reflects the entrepreneurial leaders' action in performing leadership tasks creatively, applying innovative approaches to solve problems and considering all of the organisation's stakeholders when making decisions.

Accelerator behaviour includes challenging staff for creative thinking, encouraging them to improve their task performances through innovative approaches and creating a supportive environment for them to try new approaches. Finally, integrator behaviour is reflected when the organisation's vision is communicated to the staff, encouraging them to engage in entrepreneurial thinking as well as providing money for innovative ideas. Despite its merits in measuring different aspects of entrepreneurial leadership in established organisations, there is limited empirical research that has applied the questionnaire to assess entrepreneurial leadership behaviours particularly in educational contexts (Yusof, 2009). Using the ELQ (Thornberry, 2006), Yusof (2009) examined academic leaders' entrepreneurial leadership behaviour in four Malaysian research universities through academicians' (professors, associate professors and lecturers) perspectives. The findings of the study indicated the questionnaire was valid and reliable to measure entrepreneurial leadership behaviour in Malaysian educational contexts. However, the research only focused on one dimension of entrepreneurial leadership

behaviour (general entrepreneurial leadership behaviour) and did not examine the other four aspects of entrepreneurial leadership behaviour. Drawing upon Thornberry's (2006) conceptual framework and using the ELQ, this study attempted to address two important questions. First, is the ELQ valid to measure Malaysian secondary school principals' entrepreneurial leadership behaviour and second, is the principals' entrepreneurial leadership behaviour a multi-dimensional concept consisting of general entrepreneurial leader behaviour, explorer behaviour, miner behaviour, accelerator behaviour and integrator behaviour?

METHOD

Participants

This paper reports the first phase of a research project on entrepreneurial leadership at Malaysian secondary schools. The population for this study was the teachers from secondary schools in the district of Hulu Langat, Selangor in West Malaysia. Three hundred teachers were selected from six public secondary schools as a sample for the study. The schools were selected based on the criteria that the principals must have more than two years of experience in leading that school. This criterion was used to ensure that the teachers had enough knowledge about the principals' leadership practices at the school. Fifty teachers were randomly selected from each school. Only public secondary schools were involved in this study because according to Eyal and Kark (2004) and Eyal and Inbar (2003), school principals' entrepreneurial orientation varies among different education levels due to the extent of the principals' autonomy, the school's organisational bureaucracy in the education system and the variety of students and their enrolling subjects. The participants were chosen from both daily academic (n = 262, 87%) and high performing schools (n = 38, 12%). The majority of the teachers were of the age 41 to 50 (42%) years. Most of the teachers were female (n = 267; 88.4%) with 8 to 33 (n = 271, 90%) years of teaching experience.

Entrepreneurial Leadership Measure

The Entrepreneurial Leadership Questionnaire (ELQ) developed by Thornberry (2006) was employed to measure school principals' entrepreneurial leadership behaviours. The questionnaire consists of 50 items on five dimensions of entrepreneurial leadership including general entrepreneurial leader behaviour (GELB), explorer behaviour (EXPB), miner behaviour (MINB), accelerator behaviour (ACCB) and integrator behaviour (INTB). The questionnaire measures GELB by nine items, EXPB by nine items, MINB by seven items, ACCB by 11 items and INTB by 14 items (refer to Appendix A). Some words in the questionnaire were changed such as the word business to school in order to improve their validity in measuring the entrepreneurial leadership behaviour of school principals due to the fact that the instrument originated within the entrepreneurship and business domains. Subsequently, the questionnaire was

translated from English to Malay and back to English by two bilingual experts (two of the authors) to ensure the accuracy of the translated questionnaire.

To ensure the appropriateness of the translated questionnaire, the experts tested the questionnaire against four criteria (Pan & Fond, 2010). First, each item was checked to ensure none of the concepts had been deleted. Second, each item was tested for the accuracy and appropriateness of the vocabulary, grammar and usage of conventions. Third, each item was tested to see if it expressed the same concept as in English. Finally, each item was checked to ensure that it did not contain any concept unfamiliar to the participants. The questionnaire also included the teachers' background information such as age, gender, years of teaching experience, type of school and number of enrolling students. The participants were asked to indicate their degree of agreement with the items of the questionnaire on a 5-point Likert scale anchored from 1 (strongly disagree) to 5 (strongly agree).

Data Collection

Participation in this study was entirely voluntary and all questionnaires were administered completed anonymously. Data collection was conducted during the academic year of 2011-2012. Permission to conduct the research was obtained from the Ministry of Education and the school principals by sending them a packet that included the research questionnaire and a cover letter which briefly explained the objectives of the study and described how the research would be of benefit to the schools and education on the whole.

Data Analysis

To measure different dimensions of entrepreneurial leadership behaviour and specify the best items that represent the five dimensions of the construct, Structural Equation Modelling (SEM) and AMOS Version 20 were employed. The technique of Hair *et al*. (2010) was also adopted for the study's data analysis. First, the structure of the items and loadings of the factors to each of the five constructs in the model (GELB, EXPB, MINB, ACCB and INTB) were assessed by performing a Confirmatory Factor Analysis (CFA) for each construct. This step helped in eliminating the items with low loadings (<.60) to the factors. Of the nine items measuring GELB, two items were deleted (GEL4 and GEL2). Three items from EXPB (EXP8, EXP3 and EXP1), two items from ACCB (ACC11 and ACC10) and one item from INTB (INT14) were also deleted due to their low loadings to the factors. Second, the measurement model fit indices for the individual constructs including, GELB, EXPB, ACCB and INTB were examined to ensure the relationships among the latent and observed variables were supported by the data. Table 1 shows means, standard deviations and correlations for all the constructs in the model. The correlations among all the study constructs were significant. This indicates the

theoretical and conceptual interrelationships which are parallel among the constructs in the measurement model (Schreiber *et al*., 2006).

FINDINGS

To examine the validity and reliability of the ELQ, the measurement model with all of the five constructs was developed and the items with high factor loadings included in one measurement model. Table 2 presents the means, standard deviations, factor loadings (FLs) and Cronbach's *a* obtained for all the items in the ELQ before deleting the items with low loadings. The Cronbach's *a* showed that all of the constructs scored higher than 0.80 indicating that the questionnaire was highly reliable to measure the dimensions of school principals' entrepreneurial leadership behaviour. Analysis of the measurement model developed with all the study constructs and items indicated that the model does not fit the data because the goodness-of-fit indices were less than 0.90 and RMSEA was higher than the 0.05 threshold (Byrne, 2010) [Chi-Square (x^2=3392.34); Degree of Freedom (DF = 979); p = 000; goodness-of-fit index (GFI = .58); adjusted goodness-of-fit index (AGFI = .54); comparative fit index (CFI = .79); Bentler-Bone normed fit index (NFI = .73); Tucker-Lewis index (TLI = .78); and root-mean square error of approximation (RMSEA = .091)]. In order to improve the goodness-of-fit indices, the items with high correlations were deleted (M.I > 20).

In this step, four items from GELB (GEL8, GEL1, GEL 5 and GEL3) were deleted one at a time. These items were related to principals' behaviour in taking risks and dealing with school organisational rules and bureaucracy. Two items from EXPB (EXP2 and EXP4) were also eliminated. These items measured principals' behaviour in highlighting the weaknesses of competitors and creating new ways to grow the school. Of the items on MINB (MIN3, MIN1, MIN2 and MIN4), four were deleted. These items estimated principals' behaviour in communicating school improvement goals with upper managers, searching for creative ways to use resources, considering school stakeholders when making decisions, and challenging school members to creatively improve school effectiveness.

TABLE 1
Means, Standard Deviations and Correlations of Study Constructs

Variables	Mean	SD	1	2	3	4	5
General entrepreneurial leadership behaviour (GELB)	29.50	5.49	1				
Explorer behaviour (EXPB)	33.17	6.66	.74**	1			
Miner behaviour (MINB)	26.25	4.68	.79**	.82**	1		
Accelerator behaviour (ACCB)	39.21	7.39	.84**	.84**	.84**	1	
Integrator behaviour (INTB)	49.72	9.93	.82**	.80**	.83**	.84**	1

** Indicate Correlation is significant at the 0.01 level (2-tailed).

TABLE 2
Mean, Standard Deviation and Factor Loadings for Entrepreneurial Leadership Questionnaire Items

Constructs	Items	Mean	SD	FLs	a	Constructs	Items	Mean	SD	FLs	*a*
General	GEL1	3.62	1.0	.56	.93	Accelerator	ACC1	3.50	.97	.70	.91
entrepreneurial	GEL2	3.10	1.0	.43		behaviour	ACC2	3.74	.90	.77	
leadership	GEL3	3.57	.96	.78		(ACCB)	ACC3	3.25	1.11	.52	
behaviour	GEL4	1.68	1.0	.07			ACC4	3.40	.93	.57	
(GELB)	GEL5	3.16	.97	.62			ACC5	3.69	.89	.66	
	GEL6	3.56	.88	.78			ACC6	3.63	.84	.67	
	GEL7	3.58	.85	.68			ACC7	3.64	.78	.79	
	GEL8	3.49	.93	.50			ACC8	3.68	.79	.72	
	GEL9	3.70	.90	.79			ACC9	3.55	.84	.66	
							ACC10	3.61	.96	.85	
							ACC11	3.48	1.01	.80	
Explorer	EXP1	3.92	.91	.71	.93	Integrator	INT1	3.74	.90	.63	.94
behaviour	EXP2	3.65	.94	.72		behaviour	INT2	3.20	.99	.59	
(EXPB)	EXP3	3.82	.93	.73		(INTB)	INT3	3.64	.94	.82	
	EXP4	3.86	.86	.84			INT4	3.59	.93	.79	
	EXP5	3.60	.89	.84			INT5	3.69	.91	.84	
	EXP6	3.52	.87	.81			INT6	3.16	.98	.74	
	EXP7	3.68	.87	.79			INT7	3.60	.92	.81	
	EXP8	3.54	.94	.78			INT8	3.59	1.00	.80	
	EXP9	3.54	.95	.81			INT9	3.74	.87	.79	
							INT10	3.78	.87	.74	
Miner	MIN1	3.81	.92	.74	.81		INT11	3.72	.83	.84	
behaviour	MIN2	3.76	.87	.79			INT12	3.81	.82	.81	
(MINB)	MIN3	3.77	.89	.73			INT13	3.32	.93	.80	
	MIN4	3.68	.85	.61			INT14	3.08	1.01	.59	
	MIN5	3.71	.83	.69							
	MIN6	3.76	.82	.66							
	MIN7	3.74	.92	.68							

The five items eliminated from ACCB (ACC3, ACC7, ACC4, ACC1 and ACC2) were related to the principals' behaviour in creating an encouraging and supportive environment for school members to be creative and take action to implement their new educational ideas. Finally, eight items from INTB (INT1, INT2, INT5, INT4, INT6, INT13, INT3 and INT8) were also deleted. These items encompassed the principals' interpersonal behaviour such as communicating an improvement vision for school, social networking, building an innovative culture in school and encouraging entrepreneurial thinking and risk taking. Fig.1 depicts the measurement model and standardised regression weights for the items.

Analysis of the measurement model developed with 18 remaining items indicated that the model fits the data well because all of the goodness-of-fit indices were higher than 0.90 and RMSEA was less than the 0.05 threshold (Hair *et al*., 2010) [$x^2 = 199.34$; DF = 125; $p = 000$; GFI = .93; AGFI = .90; CFI = .97; NFI = .98; TLI = .97; and RMSEA = .045]. Table 3 shows means, standard deviations, factor

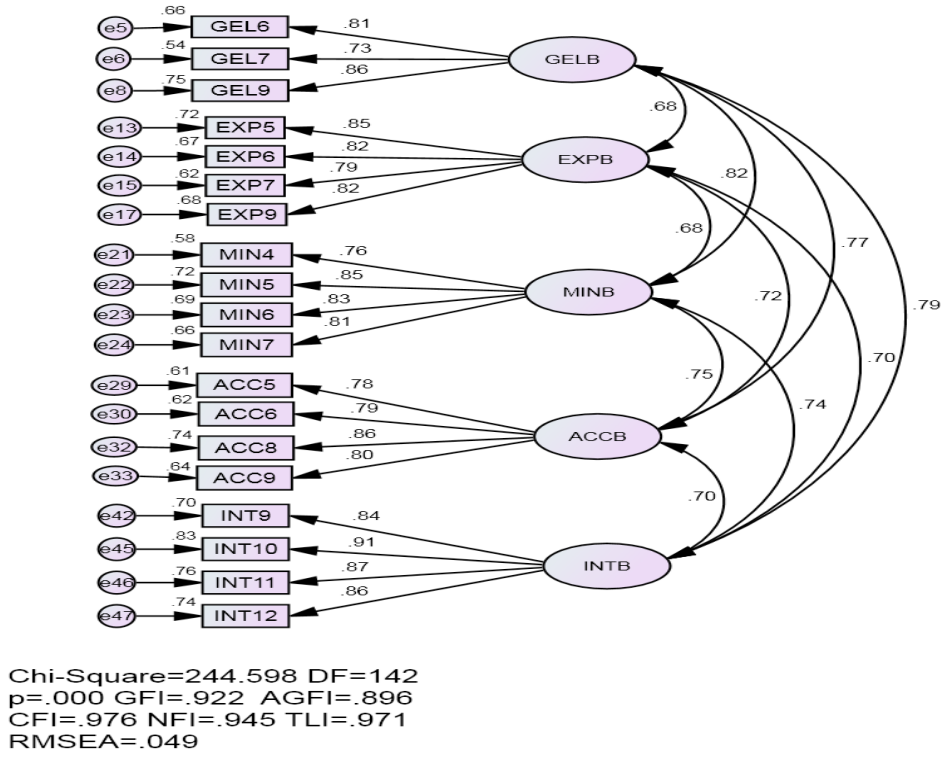

Fig.1: Measurement model for entrepreneurial leadership with standardised regression weights

loadings C.R, AVE, MSV and ASV for the five constructs and 18 items included in the measurement model. All of the items in the final measurement model had high factor loadings (FLs > .70). The composite reliability indices (C.R) obtained for the study constructs were also greater than the 0.7 threshold, which confirms the high reliability of the constructs. Furthermore, all of the study constructs scored an average variance extracted (AVE), the portion of the construct variance explained by its factors, that was higher than the 0.5 thresholds, indicating a high convergent validity for all of the study constructs. The higher scores of C.R compared with AVE also supports the high convergent validity of the scale items.

To be specific, GELB is best explained by three items that measure behaviour of school principals in identifying different approaches to overcome obstacles, demonstrating an entrepreneurial orientation at work and listening to others to do things differently. EXPB is best explained by four items on motivating teachers to think of innovative ways, selling new educational ideas to upper managers, sharing the school status with teachers and selecting the

TABLE 3
Factor loadings, C.R, AVE, MSV and ASV for entrepreneurial leadership questionnaire items in the study measurement model

Constructs	Items	Factor loadings	C.R	AVE	MSV	ASV
General entrepreneurial leadership behaviour (GELB)	GEL6	.81	0.84	0.64	0.68	0.59
	GEL7	.72				
	GEL9	.89				
Explorer behaviour (EXPB)	EXP5	.84	0.89	0.67	0.51	0.48
	EXP6	.81				
	EXP7	.78				
	EXP9	.82				
Miner behaviour (MINB)	MIN5	.85	0.86	0.68	0.68	0.56
	MIN6	.81				
	MIN7	.81				
Accelerator behaviour (ACCB)	ACC5	.78	0.88	0.65	0.59	0.53
	ACC6	.78				
	ACC8	.86				
	ACC9	.79				
Integrator behaviour (INTB)	INT9	.83	0.92	0.75	0.63	0.54
	INT10	.91				
	INT11	.87				
	INT12	.85				

right people to capture new opportunities. MINB comprised three items on analysing workflows, resources and processes to improve teachers' performance, expecting the teachers to solve cross-school problems and supporting them to fight for changes and improvement. ACCB is best explained by four items on behaviour of school principals in encouraging teachers to learn new skills, changing directions when results are not being achieved, engaging them in innovative thinking and allotting time to help them find ways to improve school performance. Finally, INTB included four items on sharing information on new educational trends and methods, encouraging school improvement suggestions, taking action in implementing the suggestions, keeping school focused on its core strategy and supporting new educational initiatives.

To ensure a construct is best explained by its own items and the items are not highly correlated with items in other constructs, the discriminant validity of the constructs was also measured by Maximum Shared Squared Variance (MSV) and Average Shared Squared Variance (ASV) (Hair *et al*., 2010; Kline, 2010). Analysis of the indices obtained in this study indicated that all of the MSV and ASV scores were less than AVE scores except for GELB and MINB. MSV for GELB was higher than AVE ($0.68 > 0.64$) and MSV for MINB was equal to AVE (0.68). This implies that all of the items in the scale had the highest loadings to their own constructs and only

some of the items on GELB and MINB were highly correlated with the items on other constructs in the measurement model. This needs to be considered in order to improve the discriminant validity of the ELQ.

The findings highlight the importance of applying different dimensions of entrepreneurial leadership behavior in order to approach school leadership like an entrepreneurial leader and improve school performance.

DISCUSSION AND CONCLUSION

Our findings indicated that the ELQ was highly valid and reliable to measure Malaysian secondary school principals' entrepreneurial leadership behaviour. This finding emphasises the validity and reliability of the questionnaire in measuring Malaysian educational leaders' entrepreneurial leadership behaviour (Yusof, 2009). However, several items relating to principals' behaviour in fighting with school rules and bureaucracy, encouraging and challenging school members to be creative and innovative, exploring creative ways to use school resources, creating an innovative culture at school and encouraging entrepreneurial thinking and risk taking were deleted due to their low loadings to their factors. This supports Eyal and Inbar's (2003) finding that under centralised education systems, which includes Malaysia, principals have to obey the rules and do not have the freedom to implement innovative ideas and take risks in order to achieve educational goals. It also highlights the importance of principals' capacity to create a culture in school that encourages and supports school members to think of new educational ideas and take action to implement their ideas in order to improve their task performance.

Furthermore, The findings of this study confirmed that entrepreneurial leadership is a multi-dimensional construct consisting of five leadership behaviours including general entrepreneurial behaviour (GELB), explorer behaviour (EXPB), miner behaviour (MINB), accelerator behaviour (ACCB) and integrator behaviour (INTB) (Thornberry, 2006). In particular, GELB can be defined as school principals' practices in specifying different approaches to overcome impediments, demonstrating an entrepreneurial orientation at work and actively listening to others to find innovative ways to do things. EXPB is the school principals' behaviour in motivating teachers to think of innovative educational methods, selling new educational ideas to upper managers, sharing the school vision and status with teachers and selecting the right people to capture new opportunities for school performance improvement.

MINB reflects school principals' behaviour in analysing workflow, resources and processes to improve teachers' performance, having high expectations of teachers to solve cross-school problems and supporting teachers to fight for changes and improvement. ACCB is the principals' practices in encouraging teachers to learn new skills, motivating them to engage in innovative thinking, allocating time to help them find ways to improve school

performance and change directions when results are not being achieved. Finally, INTB includes how school principals act in sharing information on new educational trends and methods, encouraging school improvement suggestions, taking action in implementing the suggestions, keeping school focused on its core strategy and supporting new educational initiatives.

This research contributes to the limited literature on entrepreneurial leadership in educational settings (Roomi & Harrison, 2011; Xaba & Malindi, 2010; Yusof, 2009). It also provides one of the first empirical findings in measuring different dimensions of educational leaders' entrepreneurial leadership behaviour (Yusof, 2009), which includes school principals' behaviour. Our findings have several implications for entrepreneurial leadership research and practice. First, the measurement model and the items emerging from this study may assist other researchers in measuring entrepreneurial leadership behaviour in educational contexts and, specifically, Malaysian secondary schools. Second, the model can be applied to measure the impact of such leadership style on various aspects of teachers' and schools' performance. Furthermore, educators may use the model to measure current entrepreneurial leadership practices at schools in order to provide professional development and training programmes for school principals and teachers and improve their entrepreneurial leadership competencies. Teacher educators can also apply the model to assess entrepreneurial leadership behaviour among student teachers and embed entrepreneurial leadership courses and training in the current teacher education programmes in order to develop entrepreneurial leadership competencies in prospective school leaders.

Although this study provides a better understanding of how to determine entrepreneurial leadership at schools, it only focused on measuring principals' entrepreneurial leadership behaviour at secondary schools and in one district (Hulu Langat) in West Malaysia. Therefore, the findings are limited in terms of their generalisation, which cannot be applied to the larger population within the context of the study. Future research is needed to measure entrepreneurial leadership among principals in other districts and other educational levels. In addition, we only measured public secondary school teachers' perceptions toward principals' entrepreneurial leadership behaviour. Therefore, the findings should be related to school principals' entrepreneurial leadership behaviour in public school. Future research can explore if entrepreneurial leadership dimensions and the measurement model emerging from this study are valid to determine school principals' entrepreneurial leadership behaviour in private schools. Furthermore, entrepreneurial leadership behaviour of school principals was measured through teachers' perceptions. Further research should assess entrepreneurial leadership behaviour through the perspective of school principals and qualitative research methods such as observation to better

examine real entrepreneurial leadership practices in schools. Although this study asked for the participants' demographic information such as age and gender, we did not examine the impact of the factors on entrepreneurial leadership behaviour of school principals. Further research is needed to explore if the factors affect educational leaders' entrepreneurial leadership behaviour. The findings of this study also indicated that two of the entrepreneurial leadership components (GELB and MINB) were highly correlated with other constructs in the measurement model. Although the high correlation can be partially due to the conceptual similarities between the factors, future research should refine the items on the constructs in order to improve discriminant validity of the questionnaire. Further research can also be carried out to develop a standard questionnaire for measuring entrepreneurial leadership particularly in schools.

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APPENDIX

A: QUESTIONNAIRE ITEMS

Indicate your level of agreement with the following statements from 1 (strongly disagree) to 5 (strongly agree).

EXP1	Spends time on new strategies for school development.	□	□	□	□	□
EXP2	Points out the competition's weaknesses and how we could exploit them.	□	□	□	□	□
EXP3	Listens to and acts upon school stakeholders' complaints.	□	□	□	□	□
ACC1	Challenges us to think about new and better ways to do our work.	□	□	□	□	□
GEL1	Encourages the bending/circumvention of the school rules when they get in the way of achieving educational goals.	□	□	□	□	□
MIN1	Assertively communicates to upper manager regarding how things could be run better.	□	□	□	□	□
MIN2	Looks for creative ways to manage, use, or rearrange the school assets and resources.	□	□	□	□	□
EXP4	Passionately looks for new ways to grow the school.	□	□	□	□	□
EXP5	Motivates us to think of innovative ways to beat the competition.	□	□	□	□	□
EXP6	Effectively sells new educational ideas to upper management.	□	□	□	□	□
ACC2	Supports our suggestions for improving the school.	□	□	□	□	□
GEL2	Gets things done even if it means going around the system.	□	□	□	□	□
INT1	Communicates a vision of how the school could be better in the future if we were to make certain improvements.	□	□	□	□	□
ACC3	Encourages us to challenge the status quo.	□	□	□	□	□
MIN3	Makes sure that we keep the school stakeholders in mind when making changes to our school.	□	□	□	□	□
EXP7	Tells us where we stand *vis-a-vis* the competition.	□	□	□	□	□
ACC4	Pushes us to innovate in how we do our work.	□	□	□	□	□
EXP8	Actively identifies, develops and goes after new education opportunities.	□	□	□	□	□
EXP9	Makes sure that we have the right team of people in place to successfully capture these new opportunities.	□	□	□	□	□
ACC5	Displays enthusiasm for our learning new skills.	□	□	□	□	□
ACC6	Quickly takes a different direction when results aren't being achieved.	□	□	□	□	□
ACC7	Encourages others to take the initiative and action for their own ideas.	□	□	□	□	□
ACC8	Motivates teachers to think about how to do their work in new and interesting ways.	□	□	□	□	□
ACC9	Allots time to helping teachers find ways to improve our school performance.	□	□	□	□	□
ACC10	Creates a climate that encourages continuous improvement.	□	□	□	□	□
GEL3	Willingly moves ahead with a promising new approach when others might hold back.	□	□	□	□	□
GEL4	Promotes an environment where risk taking is encouraged.	□	□	□	□	□

INT2	Identifies, encourages, and protects rebels who might think and act differently than the majority of the school staff.	□	□	□	□	□
GEL5	Encourages others to outwit and out-maneuver the school's bureaucracy.	□	□	□	□	□
GEL6	Quickly utilises different approaches to overcoming obstacles when the initial one doesn't work.	□	□	□	□	□
ACC11	Creates an environment where school teachers feel free to try new things.	□	□	□	□	□
MIN4	Challenges us to creatively discover ways to do more with less.	□	□	□	□	□
GEL7	Demonstrates an entrepreneurial orientation at work.	□	□	□	□	□
INT3	Pushes the school to be fast, flexible, and adaptable so that we can react quickly when new educational opportunities arise.	□	□	□	□	□
GEL8	Actively fights the encroachment of bureaucracy in the school.	□	□	□	□	□
INT4	Utilises an extensive network of people throughout the school that is willing to help if called upon.	□	□	□	□	□
MIN5	Analyses work flow, resources, processes and procedures to see how we can do our work better, faster and with better impact on students' achievements.	□	□	□	□	□
MIN6	Expects us to constructively identify and solve cross-school problems and issues.	□	□	□	□	□
GEL9	Willingly listens to suggestions from others about how to do things differently.	□	□	□	□	□
MIN7	Supports us in fighting for changes that will improve the way the school works.	□	□	□	□	□
INT5	Strives to build an innovative culture within our school.	□	□	□	□	□
INT6	Encourages entrepreneurial thinking and risk taking.	□	□	□	□	□
INT7	Reacts quickly to remove organisational barriers that get in the way of implementing educational strategies.	□	□	□	□	□
INT8	Encourages open communication and sharing ideas across school units and functions.	□	□	□	□	□
INT9	Keeps the school informed and updated on new educational trends and methods to improve students' learning and achievement.	□	□	□	□	□
INT10	Actively encourages school improvement suggestions throughout the school.	□	□	□	□	□
INT11	Takes action to implement many of these suggestions.	□	□	□	□	□
INT12	Keeps the school focused on its core strategy but also supports new educational initiatives.	□	□	□	□	□
INT13	Puts aside money outside of the normal budget process in order to fund and support innovative ideas.	□	□	□	□	□
INT14	Encourage school staff to challenge their decisions.	□	□	□	□	□