

Innovative Thinking, Characteristics, and Competencies of Malay Technopreneurs in Small and Medium Enterprises

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ABSTRACT

The purpose of this study was to identify the innovative thinking, characteristics, and competencies of Malay Small and Medium Enterprise (SME) technopreneurs who graduated from skills training centers. Based on Katarzyna's entrepreneurship theory and the entrepreneurship model by Man et al. and Kuratko innovation model, the three main constructs of the study were selected, namely innovative thinking, characteristics, and competencies of technopreneurs. This study utilized a case study design and the data were collected using varied instruments. The participants were 32 successful Malay technopreneurs in Peninsular Malaysia with a technical and vocational background. The snowballing technique was used to select the participants. The research instruments consisted of technopreneur profiles, questionnaires, interview protocols, observation checklists, and document verification. Qualitative data were analyzed using thematic analysis. The main findings showed that the participants believe that they have innovative thinking, possess characteristics of technopreneurship, and have the competencies of technopreneurship. However, the Malay technopreneurs' major weaknesses as identified in the interview included the lack of support and networking, low leadership competence, poor marketing, lack of raw materials and human resources (skilled workers), and financial difficulties. The findings also showed several new themes emerged such as entrepreneurial personality, internal and external supports, and incubator. In conclusion, this study found that to be successful technopreneurs, they need to have innovative thinking, technopreneurial traits, competencies, and other elements such as perseverance, spirituality, family support, and digital skills. In implication, based on the empirical data, a new framework for technopreneurs is proposed that consisted of key elements such as critical and strategic thinking, problem-solving skills, internal endurance and spirituality, effective networking, talented workers and joining idea-incubator.

Keywords: Malay technopreneurs, innovative thinking, Small and Medium Enterprises (SMEs), TVET graduates, Malaysia

INTRODUCTION

The phenomena brought about by technopreneurship worldwide have led to varied innovations and changes in people's lifestyles, among the emerging phenomena such as online business, smart home, artificial intelligence, and even green technology. The fourth industrial revolution, based on technological ingenuity, has transformed numerous conventional industries and created new jobs. Technopreneurs such as Akio Morita, Andrew Grove, Bill Gates, Elon Musk, George Devol, Jawed Karim, Jeff Bezos, Hosain Rahman, Mark Zuckerberg, Larry Page, Sergey Brin, Steve Jobs, Tim Berners-Lee, and Vinton Cerf have transformed human lives based on their creative ideas. According to Oukil (2011), entrepreneurship based on technology and innovation is very exciting and important

and useful to impact industrialization, economic growth, competitiveness, and technology development. According to Burut (2018), technopreneurship is a prime mover of economic and social development with new job opportunities, contributing to a nation's well-being, generating wealth for its citizens, and further boosting national income. In the Malaysian context, technopreneurs such as Zulkifli Aaron, Mark Chang, Tengku Farith Rithaidden, Jimmy Choo, Ganesh Kumar Bangah, Richard Tan, and Tony Fernandes are successful technopreneurs and have created substantial new job opportunities through companies such as Jobstreet, Lelong.my, SuperBuy.my, and AirAsia.

In a series of Malaysia Plans from the 9th to the 11th (RMK9, RMK10 & RMK11), the government also intends to increase Malay participation in the business sector and to produce Malay technopreneurs in collaboration with technology-based enterprises. This effort aims to foster and create an innovative Malay entrepreneurial community that could become genuine technopreneurs. However, based on the level of innovation among the 60 countries that participated in the Global Entrepreneurship Monitor (GEM) in 2015, Malaysia was ranked 58th out of 60 countries compared to the other Southeast Asian countries such as the Philippines (15), Thailand (42), Indonesia (46) and Vietnam (50) (Kelley et al., 2016). This level of innovation is measured based on product innovations offered by companies in the countries involved. The 2015 GEM report showed that the level of innovative thinking of entrepreneurs in Malaysia was low. Therefore, the government must do something to increase the level of innovative thinking among entrepreneurs to become technopreneurs, especially among the Malays – in order to be able to produce products or provide services that are competitive globally. In addition, the government's efforts to empower SMEs in the three series of the Malaysia Plans in order to surge the number of Malay technopreneurs are evident. Abdul Ghani and Darawi (2012) found that SMEs are the driving force for Malaysia's economic development.

Nevertheless, the government's intention to empower SMEs failed to achieve its goals compared to the costs incurred for entrepreneurial development (Jusoh, 2006). Currently, 80 percent of local technopreneurs are in the early stages of development, but a number of them are struggling to survive due to lack of funds (Edwin, 2008). To identify the challenges of technopreneurs in Malaysia, a comprehensive research needs to be conducted.

LITERATURE REVIEW

The development of technopreneurs is a hotly debated current issue not only locally but also globally. In 2000, United Nations launched the Millennium Development Goals (MDGs) in response to various world challenges. MDGs were based on the eight pillars, and one of those goals was global partnership, – which focused on sharing various aspects such as trade, financial system, and entrepreneurship. A global partnership from an entrepreneurial standpoint is sharing various information related to development, systems, financial aid, and entrepreneurial opportunities (United Nations, 2016). Fifteen years later, United Nations put forward another agenda known as Sustainable Development Goals (SDGs) in 2015. SDGs were based on the 17 goals, of which the 9th goal was to build resilient infrastructure, to promote inclusive and sustainable industries, and to promote innovation related to entrepreneurship. This goal can be achieved through financial support, adopting appropriate technology, establishing network, generating creative enterprises and investing in research and development (United Nations, 2016). In addition, UNESCO also focused on youth and technopreneurial development. At the UNESCO-UNEVOC virtual conference in October 2015, UNESCO launched the idea of building a viable pathways for the youth. The idea suggests the active role of educational and vocational training institutions in promoting entrepreneurship among the youth. UNESCO envisioned youth entrepreneurship as a viable path and should be made a national agenda, especially in developing countries (UNESCO, 2015). In 2016, UNESCO launched a Technical and Vocational Education and Training Plan 2016-2021 (UNESCO, 2016). The essence of this plan is to focus on three main aspects – improving skills and entrepreneurship, promoting equity and gender equality, and facilitating the transition to a green economy and a sustainable society. The UNESCO plan could act as a stepping stone to innovation and to open up new opportunities in technopreneurship.

In Malaysia, in the national budget of 2011, the former Malaysia's prime minister has announced a new action plan for Malaysia to become a high-income nation. By 2050, Malaysia aims to become one of the top 20 developed countries through National Transformation Plan 2050 (TN 50).

TN 50 is a 30-year transformation plan for Malaysia in the period of 2020 to 2050. In order to achieve that lofty goal, a critical mass of entrepreneurs and technopreneurs has to be developed.

Entrepreneur vs. Technopreneur

Dorf and Byers (2005) defined entrepreneurs as a business leadership style that involves high potential human resources, capitalization, technology-oriented commercial opportunities, spearheading fast business growth, and managing reasonable risk-taking. According to Shane and Venkataraman (2004), entrepreneurship is a process of gathering resources, systems, and technical strategies to discover new opportunities. The term "technopreneur" is relatively new in Malaysia and has been gazetted as a new term by *Dewan Bahasa dan Pustaka* (the Language and Literature Council). Technopreneur is a combination of two words "entrepreneurs" and "technology". In Malaysia and Singapore, the synonymous term is "technopreneur" (Foo & Foo, 2000). In other countries, technology entrepreneur is used (Robert & Aaron, 2011). In Europe, the phrase "technology-driven entrepreneurship" is sometimes used (Luca, 2008). In Romania, the term "technology entrepreneurship" is used (Roja & Năstase, 2014) whereas in Sweden, technopreneurs are known as technological entrepreneurship (Dahlstrand, 2007). There are also other terms for technopreneurs, such as technical entrepreneurship, techno-entrepreneurship, and ecosystem technology entrepreneurship (Therin, 2007). According to Burut (2018), technopreneurs are involved in commercializing new technologies.

THEORETICAL FRAMEWORK

This study used several theories as its underpinning theoretical framework such as Man et al. (2002), Kuratko (2012), and Katarzyna (2014) theories to explain about innovative thinking, characteristics, and competencies of technopreneurs. According to Katarzyna (2014), the technopreneurs' characteristics and competencies could reflect in their innovative thinking. Man et al. (2002) proposed a competitive model for SMEs. Three elements are important in creating company competitiveness, namely: (i) forming the scope of competition, (ii) creating organizational capabilities, and (iii) setting goals and taking action. In addition, critical technopreneurial competencies included seeking opportunities, finding new ideas, leadership qualities, strategic and innovative thinking. According to Kuratko et al. (2012), innovative thinking is an integrated mindset that permeates individuals and organizations to improve company's competitiveness and performance. The characteristics of innovative thinking included seeking opportunities, taking risks beyond security, and having tenacity to push an idea to become a reality. Based on some innovative thinking models, the critical dimensions of innovative thinking construct are thinking skills, problem-solving skills, strategic thinking, and innovation.

STATEMENT OF THE PROBLEM

The Malaysian government introduced the New Economic Policy (NEP) in 1970 after a bloody ethnic clash between Malay and Chinese on the 13 May 1969 due to economic imbalances between the ethnic groups. The government also introduced several Malay entrepreneur development programs such as entrepreneurship program under the supervision of MARA (Ratnam, 1998). Apart from the entrepreneur development program, the government also provided capital assistance to potential entrepreneurs who wanted to expand their business. However, the Malay's involvement in entrepreneurship as a whole is still at a low level compared to the non-Malays (Othman & Harun, 2007).

Malays is seen as weak and far behind in their participation in economic activities, namely equity ownership and employment (Mohamad, 1992; Omar, 2000). However, within the 30-year of the implementation of the NEP (1970 – 2000), the government's goal of 30% Malay equity was not fully achieved based on the indication of the Malay equity ownership in the corporate sector was only 20.6 percent (Othman & Harun, 2007). In order to overcome this, the Malay's involvement in the corporate and entrepreneurship sectors must be enhanced. In the RMK-10, strategic initiatives to strengthen the Malay development agenda have been formulated by the government, such as increasing Malay equity

ownership through institutionalization and improving skills and entrepreneurship development programs, and financing various Malay development agencies.

According to Ismail (2006), although the number of Malays involved in the trade and industrial sectors has increased, their involvement is still low and limited to less potent sectors and operated at a relatively small size. The main hurdles faced by the Malay entrepreneurs are the lack of capital and low entrepreneurial skills. In addition to the lack of capital and low entrepreneurial skills, the Malay entrepreneurs were easily satisfied with their small success – causing them to be unable to develop themselves and to compete globally (Ismail, 2006). Hence, the Malay entrepreneurs need to take a quantum leap in making drastic changes and transformation in critical aspects, especially in terms of innovation and creativity.

Based on the relevant literature, several researchers found suppressive factors for Malay entrepreneurs such as lack of innovative ideas, capital and market problems, and poor business management (Yusof & Latif, 1977; Yaakub, 1978; Shariffuddin, 1990; Mohamad, 1992; Osman, 1995; Nasrudin, 2003; Abdullah & Mustapha, 2009; Nadzri et al., 2014). Poor entrepreneurial characteristics of Malay entrepreneurs were a significant weakness. According to Ahmad (2006), the ever-changing economic environment requires entrepreneurs to have positive entrepreneurial characteristics and high level of entrepreneurial competencies.

Past studies (Gadenne, 1999; Littunen & Storhammar, 2000; Jaafar et al., 2004; Beugelsdijk & Noorderhaven, 2005; Visser et al., 2005; Kader et al., 2009) clearly showed that the performance of an enterprise is positively correlated to entrepreneurial characteristics and competencies. However, Malay entrepreneurs were less competitive than non-Malay entrepreneurs (Jaffar & Ibrahim, 2004). Mahmood and Mohamad (2011) stated that the lacklustre performance of Malay enterprises are also associated with less innovative Malay entrepreneurs. Innovative thinking is the core of entrepreneurial trait according to Schumpeter (1934) theory of creative destruction. In entrepreneurship, innovative thinking is important for entrepreneurs to be more competitive (Lin et al., 2011).

In line with the Malaysian government's goal of becoming a high-income nation, various efforts are being made to strengthen technology-based entrepreneurship (technopreneurs), such as MARA technopreneurial program. However, this program mainly produces knowledgeable and capable entrepreneurs in terms of technology but less effective in enhancing technopreneurs' innovative thinking (Abiddin & Sabri, 2009). Jusoh (2006) stated that the development of technopreneurs in Malaysia is not consistent, and there is a waste of resources because it is implemented by various ministries and agencies. Also, the programs conducted do not focus on nurturing innovative thinking, which is the core of technopreneurship (Jusoh, 2006). Hence, to develop a workable model of technopreneurship, there must be an integrated development framework among technical skills, entrepreneurial skills, and innovative thinking. In the Malaysian economy, technopreneurs play the same role as ordinary entrepreneurs. However, technopreneurs are burdened because they need to be more innovative to invent new technology to create novel products, services, and production processes (Jusoh & Halim, 2006). Therefore, the development of technopreneurs requires strategic planning, heavy investment and attractive incentives.

Ahmad (2009) stated that most technopreneurs in Malaysia are SME entrepreneurs involved with the manufacturing industry. Based on the 2016 SME Report, SME GDP growth for the manufacturing industry decreased by 1.4 percent in 2015 as compared to 2011 (SME, 2016). The decline in SMI GDP growth for the manufacturing industry affected the decline in total SMI GDP from 7.3 percent in 2011 to 6.1 percent in 2015. These statistics indicated that Malaysia's manufacturing industry sector is declining and there is a need to produce more technopreneurs with creative ideas (Whah, 2010).

According to Lee and Lee (2007), in Malaysia, small and start-up companies are more likely to innovate than the old ones. This may be because the new companies need to enhance their competitiveness in the open market quickly. Also, Lee and Lee (2007) stated that small-sized companies are more innovative than medium ones because small firms have more selective employees to innovate. This shows that innovation in SMEs depends on competitive and employee factors. Among Malays, their involvement in technopreneurship is low compared to non-Malays, which is only 40.6 percent compared to 59.4 percent of non-Malay technopreneurs (Whah, 2010). According to Whah (2010), the number of Malay involvement in the technopreneurship sector shows that their innovative thinking is weaker than that of non-Malay technopreneurs. Therefore, it is critical to examine Malay

technopreneurs to identify the critical elements that could enhance Malay technopreneurs' innovative thinking and creativity.

PURPOSE AND THE RESEARCH QUESTIONS

The purpose of this study was to identify innovative thinking, characteristics, and competencies of Malay Small and Medium Enterprise (SME) technopreneurs who graduated from skills training centers. Specifically, the research questions were as follows:

- (i) To what extent do Malay technopreneurs possess innovative thinking?
- (ii) What are the characteristics of entrepreneurship among Malay technopreneurs?
- (iii) What are the entrepreneurial competencies among Malay technopreneurs?
- (iv) What are factors that influence the innovative thinking of Malay technopreneurs?
- (v) What are the elements that support the innovative thinking of Malay technopreneurs from the observational analysis?
- (vi) What are the elements for a new framework of innovative thinking of the Malay technopreneurs?

METHODOLOGY

Methodologically, this study used a qualitative approach. In particular, this study utilized a case study design. According to Konting (2005), a case study is an intensive research conducted by researchers on a social unit such as an individual, a family, a school, or a community. A case study is an empirical inquiry to investigate a real context phenomenon at a specific site (Yin, 2014). This case study used several instruments such as questionnaires, interview protocols, and open-ended questions. In this study, 32 participants were selected purposively among the most successful Malay technopreneurs in Peninsular Malaysia. The technique used by the researchers to select the study participants was by using nonprobability sampling – which is a snowball technique. The snowball sampling technique is a sampling procedure in which the study participant or the other party is asked to suggest another participant (Chua, 2011 & Creswell, 2012).

In the interview, the number of technopreneurs selected to participate in the interview was nine informants. Patton (2015) emphasized that a small number of study participants will allow researchers to focus intensely and carefully on the data. Ahmad and Mahamod (2015) stated that selecting sample size will depend on the purpose, time, and matter studied. All of these technopreneurs have been involved in business for five to 10 years. The criteria for selection of study participants among Malay SME technopreneurs were based on the following characteristics: (a) graduates of vocational training center, (b) at least 5 years of being technopreneurs, (c) technology-based business, and (d) own an enterprise.

RESULTS

The purpose of this study was to identify innovative thinking, characteristics, and entrepreneurial competencies among SME Malay technopreneurs who graduated from skills training centers and then propose a new framework for the development of technopreneurs. The study's empirical finding on the first research question showed that the participants believe that they possessed innovative thinking that makes their business competitive and successful. In the second research question, the researchers focused on the key entrepreneurial characteristics found in Malay technopreneurs. The results illustrated the participants agreed that they: (a) have clear goals, (b) are risk-takers, (c) possess high motivation, (d) persevere, (e) maintain integrity, (f) are creative, and (g) are responsive to suggestions.

Apart from entrepreneurship characteristics, entrepreneurial competencies are also pertinent. In the third research question, the researchers identified six entrepreneurial competencies found in the participants. They: (a) have technical skills, (b) possess leadership competency, (c) build network, (d)

do planning regularly, (e) put commitment to succeed as a high priority, and (f) are able to generate new ideas.

In the fourth research question, the researchers examined the factors that influence Malay technopreneurs' innovative thinking. Based on the findings, most technopreneurs stated family's role model as a significant factor affecting their innovative thinking. For example, most of the technopreneurs inherited and continued the legacy of the family business. Another factor was technical background. As graduates of technical institutions, the participants admitted that they have had a competitive advantage over other non-technical graduates. Another factor was reading habit among the technopreneurs. They admitted that their reading related to their core business could enhance their innovative thinking. These aspects are essential to enhance and stimulate technopreneurs' innovative thinking.

The fifth research question was designed to identify the elements that support the innovative thinking of technopreneurs based on observational analysis. The outcomes indicated that the elements that support the participants' innovative thinking included: (a) critical thinking, (b) creativity, (c) risk-taking, (d) goal-oriented, (e) continuous quality improvement, and (f) network. In answering the sixth research question regarding developing a new framework for technopreneurs, the findings showed several new themes emerged such as entrepreneurial personality, internal and external supports, and incubator. The critical dimensions in technopreneurs' personality were (a) the desire to become a technopreneur, (b) having creative and innovative thinking, and (c) resilience. With regard to the internal and external supports – family, motivation, spirituality, technical knowledge, and vocational skills. These supportive aspects will assist technopreneurs to face the challenges and obstacles when they venture into the field of technology-based business.

In addition, other external elements consisted of support from government agencies, mentors, banking networks or lending agencies, technopreneurs' associations, and technopreneur partners in terms of networking. Finally, participants asserted the importance of idea-incubator. To incubate a new idea, the participants suggested the need for business planning, business capital, technopreneurial training, marketing skills, digital skills, organizational management, and business basics. These new elements in the framework of technopreneurs development are important to be applied in technopreneurs development training.

DISCUSSION AND IMPLICATIONS

The study's main contribution is a new framework for the development of Malay technopreneurs in Malaysia. Based on the empirical data, a variety of new elements have been found, such as the desire to become technopreneur, resilience, business capital, business planning, technopreneurship training, vocational skills, digital skills, networking, business fundamental, government support, and spiritual aspects – which are vital as internal and external supports to the technopreneurs.

The elements proposed in the new framework for technopreneurs were obtained from the empirical data from interviews, observations, document verification, and open-ended questions conducted on Malay SME technopreneurs participated in this study. Based on the study's empirical findings, the researchers proposed a new framework for the development of innovative thinking for technopreneurs. In general, it focuses on three main aspects – entrepreneurial personality, internal and external supports, and incubator. In particular, elements found in the entrepreneurial personality such as the desire to become a technopreneur and having characteristics and competencies of a technopreneur. For internal and external supports – resilience, motivation, family, spirituality, knowledge, network, capital, technical skills, and mentors are critical. In the context of incubator, elements such as idea-incubator, creativity, business fundamental, business planning, digital skills, and government support are pertinent.

A technopreneur should possess these traits and competencies as an internal strength for them to overcome the challenges and obstacles to succeed in their business. The external and internal elements consisted of technical knowledge, vocational skills, motivation, resilience, spirituality, and family. These supportive aspects will assist technopreneurs to face the challenges and obstacles when they venture into the field of technology-based business. Additional supports consisted of government support, mentors, banking networks or lending agencies, technopreneurs' associations, and

technopreneur partners in terms of networking. These aspects in the business network are a lifeline for technopreneurs to grow their business, to get out of the business crisis, or as a platform for them to sustain their business.

The last element in the proposed new framework for the development of technopreneurs' innovative thinking is the incubator. The incubator elements consisted of business planning, business capital, technopreneurship training, marketing skills, digital skills, organizational management, and business basics. This study found that the idea of incubator as a training ground for technopreneurs is viable.

CONCLUSION

The study aimed to identify innovative thinking, characteristics, and competencies of Malay Small and Medium Enterprise (SME) technopreneurs who graduated from skills training centers. In general, the main findings of the research could be categorized into three main aspects – the entrepreneurial personality, internal and external supports, and incubator. In particular, the elements for technopreneurs' personality included the desire to become a technopreneur and to possess the characteristics and competencies of a technopreneur. In addition, the participants stated the importance of internal and external factors in supporting the innovative thinking of technopreneurs. The internal factors included motivation, resilience, creative and innovative thinking, technical knowledge, vocational skills, spirituality, and family. The external factors comprised government support, mentors, banking networks or lending agencies, technopreneurs' associations, and technopreneur partners in terms of networking. These supportive aspects will assist technopreneurs to face the challenges and obstacles when they venture into the field of technology-based business. Additional supports consisted of business planning, business capital, enterprise knowledge, continuous learning, business experience, network, and incubator. The incubator is useful in giving head-start to start-up companies, technopreneurship training, digital skills, and business transformation. Having business network is also pertinent, as suggested by the technopreneurs – to gain a competitive advantage over competitors. Supra supports are found to be beneficial for Malay technopreneurs, especially during the hard times that include family backing and spiritual fortification. In line with the world moving toward IR 4.0, digital competency is deemed important for future technopreneurs. In conclusion, the proposed new innovative thinking framework can be adopted to guide stakeholders to develop and enhance technopreneurship in Malaysia.

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