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Factors contributing to the incubation performance of Malaysian technology incubators

(Faktor yang menyumbang pencapaian inkubasi bagi inkubator di Malaysia)

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Keywords: technology, incubation, performance, incubator, grounded theory

Abstract

This study is sought to discover contributing factors to the incubation performance of Malaysian technology incubators. Studies have shown that not all incubation programme are performed in Malaysia. Incubation performance is vital because it indicates how well an incubator is functioning and being managed. Six technology incubators in Malaysia were studied with grounded theory methodology. Six participants who are the prime interface for the incubatees and also responsible for managing the operations, planning, marketing and development of the Malaysian technology incubators were interviewed. As a result, findings from semi-structured interviews and with support from a literature review were merged to form a foundation for the development of conceptual framework. Results indicated that there are five factors contributing to the incubation performance of Malaysian technology incubators which are the incubator management team, services, incubatees' selection, funding and networking. This study provides a basis towards immediate and effective implementation policy to create an improved incubation model. The results of this study may improve the quality of Malaysian technology incubators in the future particularly to stimulate and become one of the key pillars to boost Malaysia's economy along side with transforming the incubatees themselves.

Introduction

Due to the undeniable contribution to the economic activities, the Malaysian government government has given priority to Small and Medium Enterprises (SMEs) companies in Malaysia. In 2016, SMEs contribution to Malaysia's National Gross Domestic Product (GDP) was amounted up to 36.6%. There is a slight increase as compared to 2015. During 2015, the SMEs contribution to Malaysia's GDP was recorded at 36.3%. It is expected that in 2020, the SMEs contribution is expected to contribute up to 41% of Malaysia's GDP. This positive outcome has shown that the increase of SME's contribution to the national GDP will transform Malaysia into a high-income and knowledge-based economy (Moorthy, et al. 2012).

In 2005, limited technologies, lack of adequate infrastructure to operate, lack of knowledge in marketing and lack of management skills were factors that inhibit

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SME companies to grow (Hashim and Ahmad 2005). With the globalisation of trade and investment, the Government has foreseen that the SMEs will face even stiffer competition in the future (Mohan 2007).

Therefore, several strategies have been used by the Government to boost the development of SMEs companies, including enhancing the capacity and capability of SMEs. This strategy aims to focus on seven broad areas. One of the areas is technology development and this area is aimed on promoting technological capabilities of SMEs.

The Government is committed to assist SME companies by promoting technological capabilities of SMEs. This can be proven where special allocation for the development of business incubator is presented during the 8th Malaysia Plan (8MP) (2001 – 2005) and 9th Malaysia Plan (9MP) (2006 – 2011). A total of RM40.0 million and RM228.3 million, respectively have been allocated for technology development and incubation programme in the 8MP and 9MP. Unfortunately there was no dedicated budget during the following Malaysia Plan, which is 10th Malaysia Plan (10MP).

However, according to the 10th Malaysia Plan (10MP) report, the incubation programme in Malaysia has yet to experience a significant performance. Only a few of Malaysian technology incubators are still performed until today (SME Corp 2012).

Moreover there were studies that have shown not all incubation programmes are performed as in Malaysia (Khalid 2012; Mahmud 2013). Yet, as we can see the decrease in government funding for Malaysian technology incubators have brought to a query on how well they carried out the incubation programme to fulfil the government's expectations.

While numerous empirical studies have been conducted in Western countries on technology incubation, little empirical research has been done in Malaysia especially in respect to the relation between the factors contributing to the incubation performance of Malaysian technology incubators. In focusing on these factors, this study covers a gap in the existing literature, especially in Malaysia. Therefore, this study is conducted to find out what are the contributing factors to the incubation performance of Malaysian technology incubators.

Overview of incubator in Malaysia

Incubation programme is defined as a programme that has been designed to provide SME companies with access to high technology, shared facilities and a range of business support services (United Kingdom Business Incubator (UKBI) 2010). Through incubation, the nurturing environment is proven to assist the SMEs flourish (UK Reseach and Innovation).

Based on researches worldwide, it is a known and agreeable fact that business incubator program enhances the chances of longer terms in the business field by 87% by the incubatees if compared to business persons who never joined any related program (Said et al. 2012).

Various incubator centres have been established by the government through various Ministries and Agencies (SME Annual Report 2010). Based on a study by SME Corp (2012), there are 103 active incubators in Malaysia. Incubator is defined as a centre that offers business support process that expedites the accomplishment of growth of its incubatees. Incubator offers an array of targeted resources and services that are related as a support to the incubatees (Malaysian Standards 2018). Incubatees are referred to as the tenant companies that housed in the incubator (Khalid 2012).

There are three types of business incubator namely technology incubator, non-technology incubator and virtual incubator in Malaysia (Malaysian Standards 2018). For the purpose of this study, technology incubator was used as the main focus. Technology incubator is defined as a technology based incubator that aims to

support technology transfer from institutes of higher learning or research institutes in Malaysia (Malaysian Standards 2018). Technology incubators can be a medium to help SMEs to exploit certain technologies to accelerate the growth of the companies. Moreover, the use of incubation acts as a way to expand their businesses and to accommodate future potential clients (InfoDev 2010).

Methodology

Grounded theory

Grounded theory was selected in this study. Strauss and Glaser (1967) stated that grounded theory is a general methodology to develop a theory grounded in data that are systematically gathered and analysed. According to Merriam and Simpson (2000), grounded theory method is appropriate to test the knowledge of a phenomenon which is less known.

Grounded theory has the ability of producing theory (Flynn 2007). Building theories by testing pre-existing hypotheses was the traditional technique of the social science. Therefore via grounded theory data are used in a new way to stimulate and then to shape the inductive thought process of the research (Flynn 2007).

In this study, the custom literature review was not done as per guidelines (Flynn 2007). In research methodologies, the literature review was conducted before the research process. However in this study, the guide by Glaser (1992) was adopted as the approach in which initial review is not needed and the commencement of this study with a blank mind.

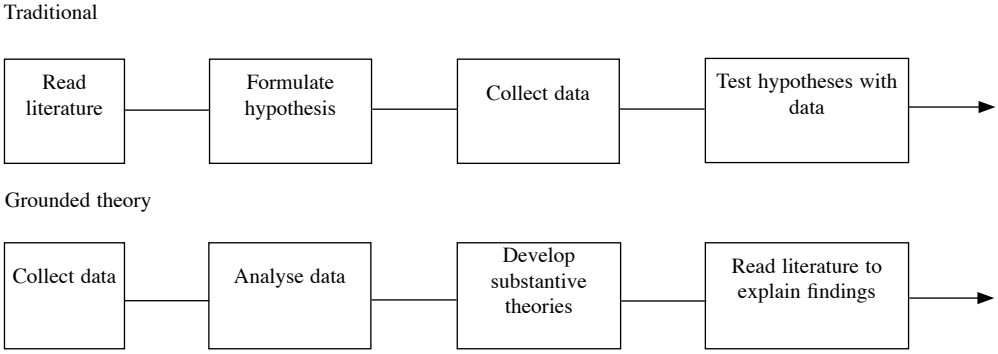
A simple illustration to demonstrate the comparison of traditional research method to grounded theory is presented in *Figure 1* (Mediani 2017).

Therefore, grounded theory by Glaser and Strauss (1967) was selected in this study to gain a deeper understanding in research problem, to study the real situation and build the conceptual framework of contributing factors to the incubation performance of Malaysian technology incubators. The process overview of grounded theory that took place in this study is explained in *Figure 2* below.

Data collection

The researcher used theoretical sampling. This selection was made by using the guide generated by Glaser (1978) where this sampling is used in order to discover categories and their properties and to suggest the interrelations into a theory.

The researcher has opted for theoretical sampling as the source of multiple actors' perspectives (Strauss and Corbin 1998). The data of this study were collected using in-depth interviews with six incubator managers of Malaysian technology incubators.

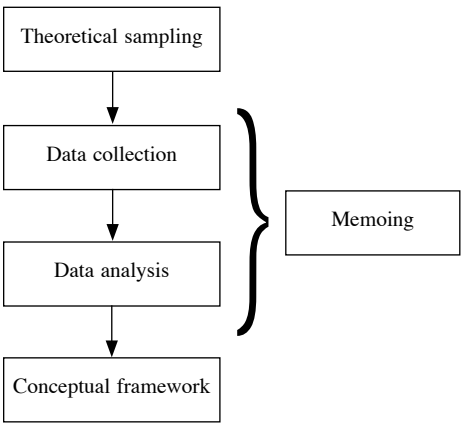


Source: Mediani, 2017

Figure 1. Comparison of traditional research methods to grounded theory

The selection of incubator managers as the participants of this study was based on justification that the incubator manager is the prime interface for the incubatees and responsible for managing the operations, planning, marketing and development of the Malaysian technology incubators. Therefore, a clear and accurate picture of the factors that contribute to the incubation performance can be obtained by the researcher. The participation of this study is based on a voluntarily basis. An appointment was made to interview each of the participants who have voluntarily agreed to participate in this study. All interviews were done at the incubator managers' office. Each of the interview session lasted for 1 – 2 hours. *Table 1* shows the description of the participants.

During the interview, the researcher recorded memos. Glaser (1978) stated that writing memo is the process of generating a theory. As data starts to gather, the researcher had to reflect on what was emerging. The process was helped by the use of memos.



Source: Glaser and Strauss (1967)

Figure 2. The process overview of grounded theory

Analysis and findings

The qualitative data analysis was carried out using Qualitative Data Analysis Software, ATLAS.Ti. To support data analysis of this grounded theory study, three levels of coding have been used as suggested by Glaser (1978).

Firstly, open coding is used. Open coding is the initial process of grounded theory that involves breaking down analysis, comparison and categorisation of data (Flynn 2007). Constant comparative is the key of the process where there was a comparison of interview to interview session to a stage where a theory emerges (Flynn 2007).

Derived from in-depth interviews with six incubator managers representing the Malaysian government technology incubators, 19 codes related to the factors and the performances' measurement were emerged as illustrated in *Table 2* below.

Next from the open-coding, the researcher moved to selective coding. The researcher filtered the data by creating new code group by combining two or more codes that are more relevant to the emerging codes. As a result, five codes were integrated into two codes. Therefore the final codes were reduced to 16 codes. The list of integrated codes is displayed in *Table 3*.

The final step involved theoretical coding. It arranges fractured substantive codes together into an organised whole

Table 1. Description of the participants

Code name	Designation	Gender	Age	Education level
IM 1	Incubator manager	M	56	Undergraduate degree
IM 2	Incubator manager	F	37	Undergraduate degree
IM 3	Incubator manager	M	58	Master degree
IM 4	Incubator manager	M	43	Undergraduate degree
IM 5	Incubator manager	F	35	Undergraduate degree
IM 6	Incubator manager	F	48	Master degree

Table 2. 19 codes related to the factors and performance emerged

No.	Codes	Number of participants	Frequency	%	Cumulative %
1	Business and technical advisory	6	24	10.96	10.96
2	Business plan	6	10	4.57	15.53
3	Diversification of expertise	6	14	6.39	21.92
4	Fact-finding strategy	2	2	0.91	22.83
5	Funding	6	28	12.79	35.62
6	Funding for incubatees	6	10	4.57	40.18
7	Funding for incubator	5	12	5.48	45.66
8	Incubatees' selection	6	17	7.76	53.42
9	Incubator management team	5	10	4.57	57.99
10	Incubator manager with business background	4	6	2.74	60.73
11	Infrastructure and facilities	6	10	4.57	65.30
12	Networking	5	16	7.31	72.60
13	Number of incubatees graduate	5	7	3.20	75.80
14	Occupancy rate	6	9	4.11	79.91
15	Pre-incubation	1	1	0.46	80.37
16	Sales growth	6	12	5.48	85.84
17	Services	6	12	5.48	91.32
18	Technology-based SMEs	6	7	3.20	94.52
19	Training	6	12	5.48	100.00
Total			219		

Table 3. List of integrated themes

Codes	Integration
Business plan	Selection approach
Fact-finding strategy	
Pre-incubation	
Diversification of expertise	Trained and diversified expertise
Training	

(Glaser 2005). Following open and selective coding, the researcher generated several substantive categories and already begun, through memo writing, to explore the possible interrelationships between codes, categories and properties.

Eventually after the period of data collection, a point was obtained when there was no newness of the data. It is also called theoretical saturation (Flynn 2007). Theoretical saturation is the point at which the researcher stops sampling, whereby categories and their properties are considered sufficiently dense and data collection no longer generates new leads (Glaser and Strauss 1967).

Finally, the total lists of 19 codes were separated into six codes group and 11 codes in group. *Table 4* shows the list of code group, the codes that are inside the group and a comprehensive consideration of the relation between the codes.

Conceptual framework

As a result of this qualitative study, a new conceptual framework of contributing factors to the incubation performance of Malaysia technology incubators was developed using the information obtained from the interviews

Table 4. Six code group and 11 codes in group

Code group	Codes in group	Concept of code
Incubator management team	• Trained and diversified expertise	– Qualified incubator managers with superior knowledge – The incubatees can leverage their diverse expertise
	• Incubator manager with business background	– Value–added quality to the incubator management. – Comprehend the theories and practical about the business and most importantly they are prepared to understand the incubatees
Services	• Business and technical advisory	– Provide services based on the incubatee needs and requests – Advisory services, business pitching guide, hands–on training and etc.
	• Infrastructure and facilities	– Laboratory, office space, pilot plant, machineries and equipments
Incubatees' selection	• Technology-based SMEs	– The SMEs companies must be involved in technology–related ventures such as areas related to ICT, biotechnology, agro–based, livestock, cosmetics, pharmaceuticals and etc.
	• Selection approach	– Submit business plan – Verified business plan via fact–finding strategies or interview session – Pre–incubations preparatory program to equip the SMEs companies with necessary knowledge and skills before they enroll in a full incubation program.
Funding	• Funding for incubator	– Development of incubators via government fund – Government fund to cover expenditure and operational cost
	• Funding for incubatee	– Incubatee needs funding to cover operational costs, to create product, for market research etc. – Various funding avenues TechnoFund i. Commercialisation of Research and Development Fund (CRDF) Fund ii. Cradle Investment Program (CIP)
Networking		– Support services – Promotional tools – Knowledge sharing
Performance	• Number of incubatees graduate • Occupancy rate • Sales growth	Performance's measurement

of participants. The result of this study shows a relationship between the factors and its potential to stimulate improvements on performance at work. The stakeholders can adapt this conceptual framework which is presented in this study to improve incubator models and implementation strategies. The conceptual framework contributing factors to the incubation performance of Malaysian technology incubators is presented in *Figure 3* below.

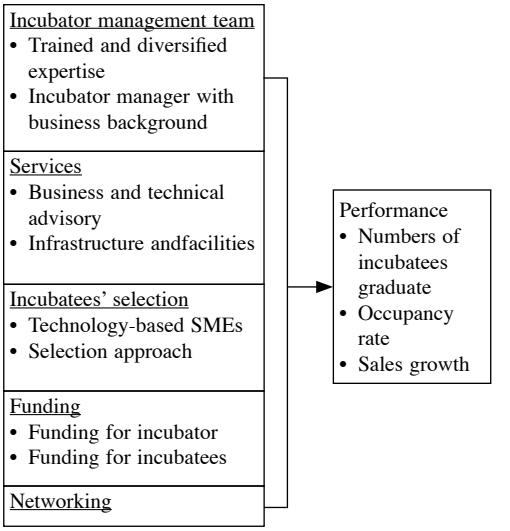


Figure 3. Conceptual framework contributing factors to the incubation performance of Malaysian technology incubators

Discussion of research findings

Incubation performance

The first interview discussion revolved around the definition of incubation performance and its measures. The simple objective of performance measurement is to ascertain how well an incubator is functioning and being managed given a set of criteria and standards (Ayatse et al. 2017).

As a result, various measures of performance were also quoted. It can be viewed that the participants have quoted three types of performance measurement. The incubator managers identified they use numbers of incubatees graduate (Udell 1990; Mian 1997 and CSES 2002), incubator's occupancy rate (Allen and McCluskey 1990) and sales growth (Mian 1997; Lindelof and Lofsten 2002 and Dettwiler et al. 2006). These findings supported the previous research by Phan et al. (2005). According to Phan et al. (2005), diverse performance measures can be used as there is no standard performance measure present in incubation literature.

Incubator management team

All of the six participants agreed that the incubator management team is one of the factors that can contribute to the incubation performance. Duff (2002) highlighted that the quality of staff in the incubator management team has an influence to the incubator. Most incubators were found to have qualified incubator managers (Degree or Master graduates) to provide necessary advisory support services to their incubatees. Furthermore, their incubator management team also has staff with superior knowledge. In their opinion, the incubatees can leverage their diverse expertise.

All six case studies indicated building management team with great competency is valuable to their incubation programme. The competency of the incubator management team needs to be enhanced to promote growth and profitability of the incubators (Said et al. 2012). All participants expressed that their organisation has invested into a long term development of the management team as competency is needed for incubator management.

Another pattern that was presented across all the six incubator managers was the incubator managers asserted that incubator manager with business background can be considered value-added quality to the incubator management. The findings suggest a person who is appointed as an incubator manager should be a person who can be clearly seen across paperwork and cope with reality in business. Past studies have acknowledged that the incubator managers must have a business background to lead the

team (Wiggins and Gibson 2003; Ong and Hassani 2011).This is because the incubator managers have a thorough grounding of the theories and be practical about the business, and most importantly they are well prepared to understand the incubatees.

Services

Services appear to be one of the important factors that can contribute to the incubation performance. Across cases, the researcher found that the services offered by Malaysian technology incubators come in two states which are physical (infrastructures and facilities) and business and technical advisory.

The physical services ranging from pilot plant, laboratories, office space, meeting room etc. Dee et al. (2012) pointed out that physical resources such as building and facilities attribute values to the incubatees. The incubatees can use professional facilities such as meeting rooms, reception, ICT especially for a peer-to-peer networking.

Business and technical advisory is most needed by the incubatees. These were raised during interviews with the participants indicating business and technical advisory is crucial to shape their business growth, fill the knowledge gaps in technology and allow the incubatees to know what is the right thing to do at early stage. This is supported by Benjamin (2009) and Khalid (2012) who identified business and technical advisory is vital in incubation programme. Additionally, Cumming and Fisher (2010) have discussed that business advisory has a positive impact to incubatees' sales growth.

Pattern appeared showed that they offered services based on incubatees' requirement. This is supported by Fang et al. (2010) which viewed services offered should be designed and offered to the incubatees. Most participants' perceived that by doing so, it helps to support incubatees' development and findings indicated that the incubatees will gain benefits from those services offered.

Incubatees' selection

Incubatees' selection appears to be one of the important contributing factors to the incubation performance. According to CSES (2002), incubatees' selection is very important to ensure incubatees graduate (CSES 2002). Therefore, Wiggins and Gibson (2003) asserted that selecting an incubatee is the most important consideration that differentiates one incubator from another.

Other than that, the most distinctive feature is that all six incubator managers have underlined the primary requirement. The SMEs companies must be involved in technology-related ventures such as areas related to ICT, biotechnology, agro-based, livestock, cosmetics, pharmaceuticals and etc.

Furthermore, the researcher found that all six cases have developed their own strategies to select their incubatees. All incubator managers stated that the all application forms must be enclosed with business plan. Duff (2002) stated that business plan provides the information for initial screening decisions and helps prioritize the incubatees to which most management teams are devoted to. According to the participants, business plan is a popular and important document that can be used to present the potential incubatee to the incubator.

Funding

Funding for incubator

From this finding, 100% of the participants' incubators are owned by the Government. This highlighted a strong support by the government. This has proved that incubation programme is vital for SMEs development.

All of the participants agree that their incubation programmes are heavily dependent on the government subsidies to sustain their operations. This findings support previous study that stated funding provided by the government is used for several purposes such as covering the costs of the staff, provide services to incubatees

in terms of coaching and training program, grant for R&D and providing financial support to incubatees (InfoDev 2010).

Funding for incubates

After graduating from the incubation programme, the incubatees need financial support services to develop their business. All participants addressed that funding for the incubatees as one of the contributing factors. This findings support previous view by Barrow (2001) that highlighted besides providing incubator as a work space, incubators can offer some finance avenues such as government grant and loans, equity financing and debt financing arrangements etc.

The researcher found that several funds were made available for the incubatees in Malaysia. Most participants highlighted about TechnoFund. TechnoFund is a grant scheme which aims to stimulate the growth and successful innovation of Malaysian enterprises by increasing the level of R&D and its commercialisation. Secondly, some participants also mentioned about Commercialisation of Research and Development Fund (CRDF) or CRDF Fund. CRDF is a funding of commercialisation activities of locally developed technologies which have been undertaken by Malaysian-owned companies. Meanwhile there is a fund dedicated to start-ups. Cradle Investment Programme (CIP) has been managed by Cradle Fund Sdn. Bhd.

Networking

The researcher managed to discover another consistent finding of this study. Participants have suggested that networking appears to be another important contributing factor to incubation performance.

The incubator managers perceived networking as a support in services delivery; enhance knowledge sharing and a promotional tool. This is supported by Allen and Rahman (1985) who stated that incubator can produce positive environment by linking incubatees to more formal types of network such as banks and Government programme, as well as seed and venture capital organisations. Aernoudt (2004) considers networking, between tenants and graduates and among tenants inside the incubator, as a very important aspect of the incubation process.

Conclusion

As mentioned, the qualitative study was carried out according to the Grounded theory methodology originated from the works of Glaser and Strauss (1967).

The objective of this study is to investigate the contributing factors to the incubation performance of Malaysia technology incubators. Performance in this study was measured by numbers of incubatees graduate, incubator occupancy rate and incubatee sales growth.

A conceptual framework was successfully constructed encompasses with the themes. There are five main proposition developed in this research as follows:

i. Incubator management team has positive relation with incubation performance
ii. Services offered has positive relation with incubation performance
iii. Incubatees' selection has positive relation with incubation performance
iv. Funding has positive relation with incubation performance
v. Networking has positive relation with incubation performance

This study is focused in the Malaysian context; therefore the results of the research will not be generalised to incubators in other countries. This study suggests for future research to conduct a qualitative studies that involve incubatees as the participants. This is a research potential to measure to the incubation program performance. Technology incubation program proposed by the Government should be continuously pursued. This program offered a big pool of scientists, researchers, technology-based SMEs to produce quality products and services in order to help improve people's

well-being. This study, although significant, has some limitations. One limitation is that the study only focused on technology incubators. Another limitation is this study only focus in Malaysian context.

Reference

Aernoudt, R. (2004). Incubators: Tool for entrepreneurship? *Small Business Economics* 23(2): 127 – 135

Allen, D. and McCluskey, R. (1990). Structure, policy, services, and performance in the business incubator industry. *Entrepreneurship: Theory and Practice* 15(2): 61 – 78

Allen, D.N. and Rahman, S. (1985). Small Business Incubators: A positive environment for entrepreneurship. *Journal of Small Business Management* 23(3): 12 – 22

Ayatse, F.A., Kwahar, N. and Iyortsuun, A.J. (2017). GlodEntrepr Res. Retrieved on 15 Apr. 2018 from https://doi.org/10.1186/s40497-016-0059-6

Barrow, C. (2001). A realist's guide to the world's new business accelerators and incubator. Wiley and Sons Inc: Chiester

Benjamin, R. (2009). Effects on business incubators on knowledge acquisition of incubatees and incubatees performance, Delft University of Technology

Khalid, F.A., Gilbert, D. and Huq, A. (2012). An empirical analysis into the underlying components impacting upon business incubation process in Malaysia ICT incubators (PhD thesis). Retrieved on 12 Feb. 2018 from http: researchbank.rmit.edu.au

CSES (2002). Benchmarking of Business Incubators. European Commission Entreprise Directorate General No. Issue Brussels.

Cumming, D. and Fischer, E. 2010. Assessing the impact of publicly funded business advisory services on entrepreneurial outcomes.

Dee, N., Gill, D., Lacher, R., Livessey, F. and Minshall, T. (2012). A review of research on the role and effectiveness of business incubation for high-growth start-ups, Centre for Technology Management, Working paper series, University of Cambridge Institute of Manufacturing

Dettwiler P, Lindelof, P. and Lofsten H (2006). Utility of location: a comparative survey between small new technology-based firms located on and off science parks—implications for facilities management. *Technovation* 26(4): 506 – 517

Duff, A. Best Practice in Business Incubator Management. Retrieved on 1 Apr. 2018 from http://www.wantree.com.au/~aduff

Fang, S., Tsai, S. and Lin, J. (2010). Leveraging tenant-incubator social capital for organizational learning and performance in incubation programme. *International Small Business Journal* 28(1): 90 – 113

Flynn G. (2007) Nurses' Perception of quality nursing care: a grounded theory study overloading. Published doctoral dissertation. Southern Cross University of Lismore NSW

Glaser, B.G. (1978). Theoretical sensitivity: Advances in the methodology of grounded theory. Mill Valley, CA: Sociology Press.

Glaser, B.G. (1992). Basics of grounded theory analysis. Mill Valley, CA: Sociology Press.

Glaser, B.G. (2005). The grounded theory perspective III: Theoretical coding. Mill Valley, CA: Sociology Press.

Glaser, B.G. and Strauss, A.L. (1976). Chronic illness and the quality of eife. 1st Edition, St, Louis: Mosby

Hashim, M.K. and Ahmad, S. (2005). Exploring the Management Problem Areas in SMEs (2nd Chapter)in Small and Medium Sized Enterprises in Malaysia: Problems and Prospects, Universiti Utara Malaysia Press

InfoDev (2010). Global practice in incubation policy development and implementation. malaysia incubator country case study

Khalid, F.A. (2012). An empirical analysis into the underlying components impacting upon business incubation process in Malaysia ICT incubators (PhD thesis). Retrieved on 12 Feb. 2018 from http: researchbank.rmit.edu.au

Lo¨fsten, H. and Lindelo¨f, P. (2002). Science parks and the growth of new technology-based firmsacademic-links innovation and markets, *Research Policy* 31(6): 859 – 876

Mahmud N.A. (2013). *Key Success Factors In Business Incubation Among Incubators In Malaysia*. Project Report. UTeM, Melaka.

Malaysian Standard (2018) Incubator management-Guidelines on establishing and operating incubator centre-Draft Stage: Public Comment (40.20) Department of Standards Malaysia.

Mian, S.A. (1997). Assessing and managing the university technology business incubator: an integrative framework. *Journal of Business Venturing*, 12(4): 251 – 285

Mohan, A.V. (2007). The entrepreneur development program in Malaysia MSC cluster. The Entrepreneurs Development Flagship (MTD) Programme

Moorthy, M.K., Tan, A., Choo, C., Wei, C.S. and Ping, J.T.Y. (2012). A study on factors affecting the performance of SMEs in Malaysia - *International Journal of Academic Research In Business* 2(4): 224

Mediani, H.S. (2017). An introduction to classical grounded theory. *SOJ Nur Health Care* 3(3): 1 – 5

Merriam, S. B. and Simpson, E.L. (2000). A guide to research for educators and trainers of adults. Malabar, Florida: Krieger

Ninth Malaysia Plan (2006). Retrieved on 20 Feb. 2018 from http://www.epu.gov.my

Ong, S. and Hassani, S. (2011). An assessment of the influence of incubators on the entrepreneurship environment for innovators in Malaysia. Final report

Phan, P., Siegel, D. S. and Wright, M. (2005). Science parks and incubators: Observations, synthesis and future research. *Journal of Bussiness Venturing* 20(2): 165 182

Said, M.F., Adham K.A., Abdullah N.A, Hanninen S. and Walsh, S.T. (2012). Incubators and government policy for developing IT industry and region. *Emerging Economies, Asian Academy of Management Journal* 17(1): 65 – 96

SME Corp Malaysia (2012). Study on enhancing the effectiveness of incubation centres as a support mechanism for SME development in Malaysia

SME Annual Report 2010/2011: Leveraging Opportunities Realizing Growth, National SME Development Council.

Strauss, A. and Corbin, J. (1998). Basics of qualitative research. grounded theory procedures and techniques. 2nd Edition, SAGE Publishing

Tenth Malaysia Plan (2011). Retrieved on 20 Feb. 2018 from http://www.epu.gov.my.

Udell, G.G. (1990), "Are business incubators really creating new jobs by creating new businesses and new products?", Journal of Product Innovation Management 7(2): 108 – 122.

United Kingdom Business Incubator (UKBI). (2010). Retrieved on 20 June 2018 from http://www.ukbi.co.uk/about-ukbi/business incubation.aspx

UK Research and Innovation (GB). Retrieved on 20 June 2018 from https://stfc.ukri.org

Wiggins, J. and Gibson, D.V. (2003).Overview of US incubators and the case of the austin technology incubators, *Int. Journal Entrepreneurship and Innovation Management* 3(1/2): 56 – 66

Abstrak

Kajian ini bertujuan mendapatkan faktor yang menyumbang kepada pencapaian inkubasi bagi inkubator teknologi di Malaysia. Kajian telah menunjukkan tidak semua program inkubasi terlaksana di Malaysia. Pencapaian inkubasi adalah penting kerana ia menunjukkan bagaimana baiknya sesebuah inkubator itu berfungsi dan diuruskan. Enam buah inkubator teknologi di Malaysia telah dikaji dengan menggunakan kaedah teori *grounded*. Enam peserta merupakan pengantara utama bagi pihak inkubati dan bertanggungjawab menguruskan operasi, perancang dan pembangunan inkubator teknologi di Malaysia telah ditemu ramah. Penemuan daripada temu ramah yang dijalankan secara para berstruktur dan dengan sokongan literasi secara kritikal telah digabungkan untuk menjadikan asas bagi pembangunan rangka konseptual. Hasil kajian telah menunjukkan terdapat lima faktor yang menyumbang kepada pencapaian inkubasi bagi inkubator teknologi di Malaysia iaitu kumpulan pengurusan inkubator, perkhidmatan, pemilihan inkubati, geran dan rangkaian. Kajian ini menyediakan asas kepada tindakan perlaksanaan polisi yang cepat dan efektif untuk membentuk model inkubator yang ditambah baik. Hasil kajian ini berupaya untuk menambah baik kualiti inkubator teknologi di Malaysia pada masa hadapan bagi merangsang dan menjadi salah satu tonggak utama menaikkan ekonomi Malaysia dan mengubah inkubati sendiri.