# EXPLORING THE CHARACTERISTICS OF INCUBATEES TOWARDS ACHIEVING FOURTH GENERATION INCUBATORS

Fararishah Abdul Khalid
Universiti Teknikal Malaysia Melaka
fararishah@utem.edu.my

Amiera Syazreen binti Mohd Ghazali
Universiti Kebangsaan Malaysia
mierasyazreen@yahoo.com

Wan Nur Saidah binti Wan Mohd Zainudin
Universiti Teknikal Malaysia Melaka
eida91_zainudin@yahoo.com

## ABSTRACT

Business incubation is an economic development tool which is widely used to stimulate the growth of small to medium sized enterprises (SMEs). It is proven as an effective tool in creating jobs, and accelerating the growth of new businesses. This paper examines the underlying characteristics of incubatees that are needed at the selection phase of the business incubation process towards achieving fourth generation incubators. This study is based on a survey questionnaire from the 121 incubatees from ICT incubators in Malaysia. The characteristics of incubatees, personality, knowledge, skill and behaviour, are found to have inter-correlation among each other and shows to be significant factors for achieving fourth generation incubators. Results show that the most significant characteristic is behaviour while characteristics such as personality, skill and knowledge. The findings provide valuable information for the policy makers, business incubator managers, and potential incubatees toward achieving fourth generation incubators.

**Keywords**: Business incubator, Characteristic of Incubatees, Fourth generation incubators.

## INTRODUCTION

Research into business incubation has grown during the last decade. The important role of business incubation as an effective method to accelerate growth and development of technology-based small-to-medium sized enterprise (SMEs) has been acknowledged in the economic and entrepreneurship literature (Aernoudt, 2004; Phan, Siegel, and Wright, 2005). The concept of "incubator" is often used as an overall denomination for organizations that constitute or create a supportive environment that is conductive to the "hatching" and the development of new firms (Chan and Lau, 2005, p. 12; Lindholm-Dahlstrand and Klofsten, 2002; Lyons and Li, 2003; Vinnova, 2004).

The secret of firm success has long fascinated people, but most of these studies have focused on larger companies. However, as we know, some of the firm succeeds and the others fail. Consequently, and in line with a general demand for more rigorous evaluation (OECD, 2006), the evaluation of incubator performance has attracted some attention (Aernoudt, 2004; Bhabra Remedios and Cornelius, 2003; Chan and Lau, 2005; Grimaldi and Grandi, 2005; Hackett and Dilt, 2004a; Nolan, 2003; Phan et al, 2005).

Despite the fact that some incubators have been growing and successful, others have been declined or stagnated. What factors that affects business incubator success among incubates? This study aims to find out the characteristics of incubatees that model needed the fourth generation incubators. The empirically-based findings in this paper indicate that the current state of play in Malaysia ICT incubators is characterized by the way incubatees are selected. The paper proceeds as follows; firstly, a review of the incubation literature are provided, followed by an outline of the methodology adopted regarding data collection and analyses, leading on to the presentation of the results and discussion. The project ends with a summary and conclusions of the research.

## PROBLEM STATEMENT

The research conducted based on the selection phase on the business incubation processes. Selection phase refers to the decision concerning which venture to accept for the entry or which to reject. Researchers seem to be agreeing that selection is an important incubator management task. There have been done concerning incubator model related to the issues of incubatees selection. There are some problem statements as specified below:

1. Many applications from entrepreneurs to be incubatees have been rejected while selection phase because of entrepreneurs does not know the specific procedure to be incubatee.

2. The entrepreneurs did not know the specific characteristics and the procedure that needed while selection phase as incubatees.

## RESEARCH OBJECTIVES

The aim of this research is to study the characteristics of incubates while enhancing the success of the fourth generation in incubator industries.

This study has set out to achieve two primary objectives:-

i. To identify the significant characteristics of fourth generation incubatees.

ii. To determine the characteristics of incubatees that will create fourth generation incubators.

## METHODOLOGY

### 1.0 Theoretical Framework

There are four main ideas to provide the guidance to complete this research.

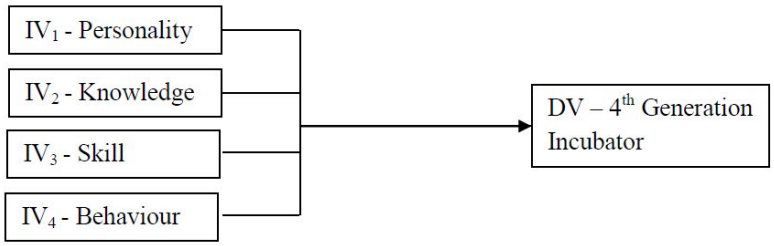


**Figure 1.0: Theoretical framework**

In this study, researcher wants to identify the relationship of characteristics of incubatees to the business incubator model. The method is included of descriptive studies because researcher is going to identify the implications of characteristics of incubatees in the business incubator in Malaysia.

## DATA ANALYSIS

The data are obtained from full interpretation of quantitative data that has been driven from a survey method, whereas researcher has been conducted by using the method of questionnaires distribution. Respondents of this survey are being among of the incubatees of the incubator industry which are involved in ICT. The questionnaires were given to the selected incubator and incubatees and had been collected two months after by researcher.

The descriptive method has been used by researcher in this survey in order to determine the characteristics of incubatees that lead to achieve fourth generation incubators by estimating the mean and represented them in figures. Besides that, researcher is also conducting a method of finding the correlation value by using the Statistical Package for Social Science (SPSS) Version 19 for Windows.

According to the research, researcher has distributed the set of questionnaires to incubatees of ICT incubators industry in Malaysia. The total set of questionnaires distributed is 187 and 121 set are obtained from respondents.

The researcher also did some demography analysis in order to identify the background of respondents. The questions are basically about gender, age and level education. All the data gathered are important to ensure the reliability of the data collected and to achieve the main objectives of the research. The researcher has used the method of finding the frequencies to describe the results.

## 1.0 Descriptive Analysis

### 1.1 Gender

| Gender | Frequency | Percentage (%) |
|---|---|---|
| Male | 79 | 65.3 |
| Female | 42 | 34.7 |
| Total | 121 | 100 |

**Table 1.1: Distribution of research respondents according to gender**

In the table 1.1, it shows the difference in gender between male and female respondents of the target population. Based on the table, male have been shown to be more likely to start a business than female. From the total of 121 respondents, male respondent is the majority of this research survey with 79 people which is contributing 65.3% of overall respondents while remain of respondent that come from female with 42 people that are 34.7%. This due to men prefer to self-reliance and self-employed than to work with others.

## 1.2 Age

| Age (years old) | Frequency | Percentage (%) |
|---|---|---|
| Below 30 | 40 | 33.1 |
| 30 – 40 | 62 | 51.2 |
| 40 – 50 | 17 | 14 |
| Above 50 | 2 | 1.7 |
| Total | 121 | 100 |

**Table 1.2: Distribution of research respondents according to age**

Refer to the table 1.2, the highest frequency of age for this research is 30 to 40 years old with 51.2%, which means that out of 121 respondents indicates about 62 respondents. The second highest group that comes close with 40 respondents (33.1%) is in range of below 30 years old. Next, there are 17 respondents (14%) whose age in range 40 to 50 years old. Lastly, respondent distribution which in the range of above 50 years old is the minority group with only 2 respondents (1.7%).

## 1.3 Race

| Race | Frequency | Percentage (%) |
|---|---|---|
| Malay | 71 | 58.7 |
| Chinese | 31 | 25.6 |
| Indian | 13 | 10.7 |
| Other | 6 | 5 |
| Total | 121 | 100 |

**Table 1.3: Distribution of research respondent according to race**

Table 1.3 shows the race of respondents consisting of 121 respondents. The highest respondent comes from Malay which 71 respondents (58.7%). The second highest is Chinese that have 31 respondents (25.6%). Followed by Indian covers up to 13 respondents (10.7%) and others have 6 respondents (5%).

## 1.4 Education Level

| Education level | Frequency | Percentage (%) |
|---|---|---|
| SPM | 7 | 5.8 |
| Diploma | 28 | 23.1 |
| Undergraduate Degree | 53 | 43.8 |
| Master's Degree | 22 | 18.2 |
| Doctoral Degree | 11 | 9.1 |
| Total | 121 | 100 |

**Table 1.4: Distribution of research respondents according to education level**

Table 1.4 show the distribution of respondent in education level that being categorized into five groups that based on Malaysia‟s education standard which are SPM, Diploma, Undergraduate Degree, Master Degree and Doctoral Degree. From the five education level the highest category is Undergraduate Degree with 53 respondents that made up the majority of 43.8%. The second highest category is Diploma with 28 respondents made up of 23.1%. Follow by category Master‟s Degree with 22 respondents (18.2%). Next category is Doctoral Degree with 11 respondents (9.1%). Lastly, with 7 respondents (5.8%) are SPM level.

## 1.5 Entrepreneurial experience

| Entrepreneurial experience | Frequency | Percentage (%) |
|---|---|---|
| 1 year | 5 | 4.1 |
| 1 - 2 years | 25 | 20.7 |
| 3 - 4 years | 40 | 33.1 |
| More than 5 years | 51 | 42.1 |
| Total | 121 | 100 |

**Table 1.5: Distribution of research respondent according to the entrepreneurial experience**

From the table 1.5, it indicates that the highest numbers of respondents have been involved for more than 5 years is 51 respondents or 42.1%. The second highest is 3 to 4 years which is 40 respondents made up of 33.1%. Next, for respondent that involved in 1 to 2 years are just 25 respondents made up of 20.7% and the lowest is 5 respondents (4.1%) for 1 year.

## 1.6 Company Status

| Company status | Frequency | Percentage (%) |
|---|---|---|
| Bumiputera | 108 | 89.3 |
| Non-Bumiputera | 13 | 10.7 |
| Total | 121 | 100 |

**Table 1.6: Distribution of research respondent according to company status**

In the table 1.6 below, it shows the respondents‟ company status that being divided into two categories which are bumiputera and non-bumiputera. Based on the table, there are 108 respondents or 89.3% of total respondents are bumiputera while the remaining 13 respondents or 10.7% are non-bumiputera.

### 1.7 Type of business involved

| Type of business | Frequency | Percentage (%) |
|---|---|---|
| Health care | 11 | 9.1 |
| Electric and electronic | 5 | 4.1 |
| Business / Professional services | 16 | 13.2 |
| Finance and insurance | 3 | 2.5 |
| Education | 8 | 6.6 |
| Service provider | 12 | 9.9 |
| Engineering / Machinery | 8 | 6.6 |
| ICT | 58 | 47.9 |
| Total | 121 | 100 |

**Table 1.7: Distribution of research respondent according to type of business**

Table 1.7 shows the distribution of research respondents based on their business. The highest respondents is come from business ICT which 58 respondents (47.9%). The second highest is business or professional services that have 16 respondents (13.2%). Next the business is service provider cover up to 12 respondents that 9.9%. For business health care there are 11 respondents that made up of 9.1%, for business education and engineering have 8 respondents (6.6%), for business electric and electronic have 5 respondents (4.1%) and the lowest come from business finance and insurance that just have 3 respondents (2.5%).

## 2.0 Reliability Testing for Items in Variables

In this study, Cronbach‟s Alpha is used to determine the internal consistency or average correlation of items for each of independent variable which are Personality of Incubatee, Knowledge of Incubatee, Skill of Incubatee and Behaviour of Incubatee, while for dependent variable is Fourth Generation Incubators. However, according to Nunnaly (1978), he said that the Cronbach‟s Alpha that has indicated 0.70 to be an acceptable reliability coefficient but lower thresholds are sometimes used in the literature. Thus, for the value of the Cronbach‟s Alpha that is less than 0.70 is assume as acceptable.

| Variables | Cronbach's Alpha | Mean | N of items |
|---|---|---|---|
| Personality of Incubatee | .890 | 4.445 | 6 |
| Knowledge of Incubatee | .828 | 4.549 | 7 |
| Skill of Incubatee | .909 | 4.575 | 7 |
| Behaviour of Incubatee | .760 | 4.496 | 7 |
| Fourth Generation Incubators | .654 | 4.522 | 5 |

**Table 2.0: Reliability Statistic**

Based on the table 2.0, the value of Cronbach‟s Alpha for variables Personality of Incubatee, Knowledge of Incubatee, Skill of Incubatee, and Behaviour of Incubatee are 0.890, 0.828, 0.909, and 0.760 respectively. The values are more than 0.7, and then it is mean all the items in each variable are acceptable. For variable of Fourth Generation Incubators are 0.654, which is less than 0.7. However, Nunnaly (1978) states that 0.7 to be an acceptable reliability coefficient but lower thresholds are sometimes used in the literature. So, the items Fourth Generation Incubators are assuming as acceptable. This occurs due to the difficulty of respondents to understand the items were in the variables.

In additions, table 2.0 also shows the value of mean for each variable related to this study. Each value is more than 4, where it means respondents agreed with the questioned items in each variable.

## 3.0 Correlation Analysis

Pearson's correlation coefficient was performed in order to determine the strength of the association between all the items available in each of the variables. Regarding to this section, researcher is going to show the finding of the results for all the variables in this research. Thus, in order to examine whether the all the characteristics contributes to achieve fourth generation incubators, the correlation of the variable is shown in the Table 3.0.

Table 3.0 shows the Pearson Correlation Coefficient Analysis between the independent variable and dependent variables of the research. Based on the table, a two-tailed test at a 0.01 significance level indicates that there are positive relationships between the independent variables Behaviour, Personality and Skill. However, the result for independent variable Knowledge indicates that there are no relationships between Fourth Generation Incubators. This is due to incubatee think they can hire another employee in the specifics area to do the work that they are not proficient.

| | | Behaviour | Personality | Skill | Knowledge | 4th Generation Incubators |
|---|---|---|---|---|---|---|
| Behaviour | Pearson Correlation | 1 | .559** | .581** | .392** | .695** |
| | Sig. (2-tailed) | | .000 | .000 | .000 | .000 |
| | N | 121 | 121 | 121 | 121 | 121 |
| Personality | Pearson Correlation | .559** | 1 | .558** | .713** | .434** |
| | Sig. (2-tailed) | .000 | | .000 | .000 | .000 |
| | N | 121 | 121 | 121 | 121 | 121 |
| Skill | Pearson Correlation | .581** | .558** | 1 | .448** | .245** |
| | Sig. (2-tailed) | .000 | .000 | | .000 | .007 |
| | N | 121 | 121 | 121 | 121 | 121 |
| Knowledge | Pearson Correlation | .392** | .713** | .448** | 1 | .173 |
| | Sig. (2-tailed) | .000 | .000 | .000 | | .058 |
| | N | 121 | 121 | 121 | 121 | 121 |
| 4th Generation Incubators | Pearson Correlation | .695** | .434** | .245** | .173 | 1 |
| | Sig. (2-tailed) | .000 | .000 | .007 | .058 | |
| | N | 121 | 121 | 121 | 121 | 121 |

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

**Table 3.0: The Correlation of the All Variables**

The table also shows the correlation value of Behaviour toward Fourth Generation Incubators is a strong positive correlation, where Personality and Skill toward Fourth Generation Incubators is low positive correlation, and Knowledge toward Fourth Generation Incubator is a very low correlation. Besides that, correlation analysis has shown that all independent variables are inter-correlated among each other.

## 4.0 Regression Analysis

Regression analysis in this research to estimate the relationship between the Personalities, Knowledge, Skill and Behavior towards Fourth Generation Incubators.

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .752[a] | .566 | .551 | .20570 |

**Table 4.0 Model Summary**

a. Predictors: (Constant), Behavior, Knowledge, Skill, Personality

| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 2.086 | .314 | | 6.648 | .000 |
| | Personality | .257 | .077 | .332 | 3.351 | .001 |
| | Knowledge | -.216 | .079 | -.239 | -2.721 | .008 |
| | Skill | -.217 | .063 | -.278 | -3.448 | .001 |
| | Behaviour | .727 | .076 | .764 | 9.522 | .000 |

**Table 4.1 Coefficients**

a. Dependent Variable: 4th Generation Incubators

Table 4.0 shows the value of R is 0.752. It measures the correlation between Fourth Generation Incubators and the variables Personality, Knowledge, Skill, and Behaviour. The value of 0.752 is more than 0.5 and close to 1 which means the relation between Fourth Generation Incubators and the variable of Personality, Knowledge, Skill and Behaviour is strong. The value of R2 is 0.566 which means the contributions of all the variables in this research is 56.6%. Based on the table 4.1, all the variables have had significant to the Fourth Generation Incubators because the value shown is below than 0.05.

## CONCLUSION

This study confirms that there exists a relationship between the four variables: personality, knowledge, skill and behaviour. The four characteristics of incubatees support the requirements and expectations fourth generation incubators. These characteristics have a significant impact on achieving fourth generation incubators in Malaysia. This implies that incubatees must have good ethics, willing to be involved in the business, and are able to communicate well. Incubators should encourage incubatees to built a strong social network and good relationship in order to ensure timely graduation of incubatee. The success of fourth

generation incubators is usually based on the number of graduation incubatees. Incubators may also assist the incubatees in improving its knowledge, strategic position, focus on its core business, reduce transaction cost, learn new skills and have better communication. This can help both business incubator and potential incubatees to achieve the status of fourth generation incubators.

## ACKNOWLEDGMENT

I would like to express my gratitude to Universiti Teknikal Malaysia Melaka for giving me this opportunity to conduct this research and share my research output in this conference paper. This research was conducted under the university's short-term grant with project number PJP/2012/FPTT (1B)/S01103.

## REFERENCES

Aernoudt, R. (2004). Incubators: Tool for Entrepreneurship? Small Business Economics, 23(2), 127-135.

Bhabra-Remedios , R. K., & Cornelius, B. (2003). Cracks in the Egg: improving performance measures in business incubator research. Annual Conference of Small Enterprise Association of Australia and New Zealand, University of Ballarat .

Chan, K. F., & Lau, T. (2005). Assessing technology incubator programs in the science park: the good, the bad and the ugly. Technovation, 25(10), 1215-1228.

Grimaldi, R., & Grandi, A. (2005). Business incubators and new venture creation: an assessment of incubating models. Technovation, 25(2), 111-121.

Hackett, S. M., & Dilts, D. M. (2004). A Systematic Review of Business Incubation Research. *Journal of Technology Transfer*, *29*, 55-82.

Lindholm-Dahlstrand , A., & Klofsten, M. (2002). Growth and Innovation Support in Swedish Science Parks and Incubators. New Technology-Based Firms at the new millenium.

Nolan, A. (2003). Public policy on business incubators: an OECD perspective. *International Journal of Entrepreneurship and Innovation Management*, *3*(1/2), 22-30.

OECD (2006). Going for Growth.