

EXAMINING THE EFFECTS OF AN ENTREPRENEURIAL ECOSYSTEM ON ENTREPRENEURIAL INTENTION AMONG ENGINEERING STUDENTS

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Abstract

This research aims to examine the effects of an entrepreneurial ecosystem on Entrepreneurial intention among engineering student. For this research objectives, the researcher wants to examine the main effect of the entrepreneurial ecosystem on Entrepreneurial intention among engineering students and determine the relationship between these three independent variables such as entrepreneurial education, social and cultural as well as financial growth with a dependent variable which is an engineering student. By using a quantitative method, the analysis data are derived from a questionnaire survey of 313 respondents from selected engineering faculties in UTeM to investigate the hypotheses of the study. Based on the Krejcie and Morgan (1970), the population, N of fourth-year engineering students in UTeM is 1672 students, so the sample size, S for this research would be 313 respondents. After that, the data collection of respondents will be analyzed in the SPSS. A multiple regression analysis was calculated to predict the engineering student based on entrepreneurial education, social and cultural as well as financial growth. A significant regression equation was found ($F(3,309) = 60.501, p < 0.000$), with an R^2 of 0.370. All of the independent variables were significant predictors of an engineering student. However, the survey questionnaires are limited for fourth-year engineering students only because the researcher has limited time to collect data all of the engineering students in UTeM. Other than that, the researcher also had constraints of financial to manage as well as handle this research.

Keywords: *Entrepreneurial Ecosystem, Entrepreneurial Intention, Entrepreneurial Education, Engineering Student, Social and Cultural, Financial Growth*

Abbreviations: NIL



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INTRODUCTION

In 1996, James Moore proposed the term "business ecosystem", transforming it into an "entrepreneurial ecosystem (EE)" (Kozhakhmetov et al., 2016). EE plays an important

role in building a favorable environment for entrepreneurs, especially students, in preparing to start their own work life business. It describes the social and economic environment affecting entrepreneurship at the local or regional level. EE is the main metaphor for promoting entrepreneurship as a strategy for economic development (Isenberg, 2014).

Zsigmond (2017) stated that Malaysia is well accomplished by the 18th consecutive Global Entrepreneurship Monitor (GEM) 2016, which is the rate of entrepreneurship tracking across multiple phases of entrepreneurship, such as examining evaluated characteristics, encouraging entrepreneurs and exploring the attitudes of representatives of society towards entrepreneurship.

Xavier (2016) mentioned that risk-taking, creativity, innovation and locus control are some of the key actions of an entrepreneurial culture. For their experts' entrepreneurial culture, Malaysia ranked 8th over Israel was ranked by their experts as the highest for entrepreneurial culture.

The GEM cites three barriers to entrepreneurship, such as lack of education, social and cultural barriers, as well as lack of financial resources, according to Rideout and Gray (2013). Strong culture and business capital without proper education do not lead to entrepreneurship (Eisenberg, 2011).

The lack of entrepreneurial education such as knowledge, skills and experiences is one of the main problems of the entrepreneurial ecosystem among engineering students. The university provides students with both knowledge related to entrepreneurship and associated skill development because typically nascent entrepreneurs lack skills. In addition, the impact of starting the activity may actually be counterproductive for those students who lack professional experience, although the activity may help to increase visibility and enhance the entrepreneurship program's reputation (Morris et al., 2017).

Social and cultural barriers, on the other hand, also give the students the negative impacts. Student perceived lack of social support was negatively associated with the emergence of ventures, and this relationship was fully mediated by entrepreneurial self-efficacy (Dinh, 2016).

In this case, when starting their own business, most students lack financial resources. Morris et al., (2017) reported that students lack personal savings, insurance, and credit history, although the usual financing sources such as family members, friends, and individual credit cards regularly prove inadequate for them. This causes students who don't have enough money to invest in their own business, feel abandoned and use the money for other activities. Therefore, this lack of investment spirit discourages

entrepreneurship, so money intended for economic activities is usually diverted to entertaining others (Lubem et al., 2017). The research purpose is to examine the effects of an entrepreneurial ecosystem on Entrepreneurial intention among engineering students. The following questions being used by the researcher as the guide:

- RQ 1: What is the main effect of entrepreneurial ecosystem on Entrepreneurial intention among engineering students?
- RQ 2: What are the relationships between the effects of entrepreneurial ecosystem with entrepreneurial intention among engineering students?

LITERATURE REVIEW

ECOSYSTEM

According to Spigel and Harrison (2018), an ecosystem is the conceptual umbrella for the advantages and resources produced by the cohesive, typically regional, entrepreneur communities include their supporters that help new high-growth ventures form, survive as well as expand. Deutsche Gesellschaft für Internationale Zusammenarbeit or GIZ (2018) stated that it is generally defined as the system or the interconnected elements group, formed by the interaction of the community of organisms with their environment. Other than that, its mean the union localized cultural outlooks, social networks, investment capital, universities and active economic policies that develop environments supportive of innovation-based ventures (Spigel, 2017).

ENTREPRENEURIAL ECOSYSTEM (EE)

According to Mason and Brown (2014), EE means the set of interconnected entrepreneurial actors, entrepreneurial organizations, institutions and entrepreneurial processes which formally and informally coalesce to connect, mediate as well as govern the performance within the local entrepreneurial environment. Kozhakhmetov et al., (2016) reported that it is the set of interconnected business organizations, institutions and business processes, formally and informally united for mediation as well as management within the local business environment.

Besides, Stam and Spigel (2016) mentioned that EE is the set of interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship within a particular territory. Then, its also defined as the interactive community within the region of geographic, varied composed, interdependent actors and factors, which evolves over time as well as both of interdependent coexist and interact to promote new venture creation (Vogel, 2013).

Spigel (2017) stated that EE as combinations of social, political, economic and cultural elements within a region that support the development, innovative startups growth, encourage nascent entrepreneurs and other actors to take the risks of starting, funding as well as otherwise assisting high-risk ventures. Moreover, EE also defined as the strategic alignment of the variety of public and private efforts to provide necessary financial, social and human capital to foster entrepreneurship in innovative as well as creative ways (Miller, 2018).

THE EFFECTS OF AN ENTREPRENEURIAL ECOSYSTEM (EE)

Entrepreneurial Education

According to Akhter and Sumi (2014), education is one of the most vital points which make entrepreneur sincere about their economic freedom, their stability and their significance. The highest level of knowledge, skills and abilities can facilitate by the start-up process and contribute to the accomplishment of a larger scope of venture-related activities by students (Morris et al., 2017). Krastina (2017) stated that the young people who benefit from entrepreneurial learning, develop business knowledge and essential skills and attitudes including creativity, initiative, tenacity, teamwork, understanding of risk and a sense of responsibility. It will transmit the knowledge and skills acquired in higher education into the technical and economic roles students subsequently perform in the marketplace.

Zhang (2014) stated that the entrepreneurial education means the teaching philosophy and model needs to adapt to economic, social as well as national development plans. It establishes entrepreneurship as a viable career option, and exposes students to explicit and tacit knowledge as well as networks that might rise their opportunities of success if they do found a firm (Shah and Pahnke, 2014).

There are two segments of entrepreneurial education such as entrepreneurial education in primary and secondary schools as well as entrepreneurial education in the universities or higher institutions but the researcher more focusing on the research towards the entrepreneurial universities in this case. The entrepreneurial universities are the most significant actors of entrepreneurial education that serve as the springboard for preparing the students to work in the new environment and centralizing innovation economy of the state (Kozhakhmetov et al., 2016).

Shah and Phanke (2014) mentioned that entrepreneurial knowledge is a critical resource for fledgeling entrepreneurs, as it provides an understanding of the entrepreneurial process and networks from which to draw resources and expertise. The knowledge acquired from entrepreneurship education can improve a student's performance to acquire resources (Morris et al., 2017). According to Ng (2015), it is a

application process and customization of a combination of domain, market, industry-specified, area as well as cultural knowledge to affect economically prudent and sustainable business venture.

According to Baggen et al., (2017), the students who are acquiring entrepreneurial skills can help in preparing themselves for a working life characterized by uncertainty and complexity. The entrepreneurship education has been really significant in a further career and business development, so the student will recognise that the skills learnt (Krastina, 2017). Mason and Brown (2014) mentioned that these are essential in the development of an EE, as future entrepreneurs learn technical skills, product as well as market knowledge in here. Furthermore, it also has a high impact on venture creation as it gives students with insights in the entrepreneurial process aid them with developing entrepreneurial skills and offers networks from which they can draw resources and expertise (Shah and Pahnke, 2014). As a result, the researcher proposes the following set of hypotheses:

- H1: Entrepreneurial education has a significant relationship with the Entrepreneurial intention of engineering students

Social and Cultural

According to Akhter and Sumi (2014), the social-cultural environment consists of all components of the social system and culture of people which positively or negatively affect as well as influence entrepreneurial emergence, behaviour, performance and entrepreneurship development. Besides, they also reported that it consists all elements, conditions and influences which shape the individual personality and potentially affect his attitude, disposition, behaviour, decisions as well as activities. Lubem et al., (2017) stated that socio-cultural factors in relation to entrepreneurship, point to all the elements within the social system and group culture of people which positively or negatively influence entrepreneurship development or entrepreneurial behaviour and performance.

According to Xavier (2016), cultural and social norms indicates the extent to which social and cultural norms encourage or allow actions leading to new business methods or activities that can potentially increase personal wealth and income. Typically, entrepreneurial ecosystem desirable places to live either on account of their cultural attractions or their physical attributes which give opportunities for outdoor activities (Mason and Brown, 2014). So we propose following hypothesis.

H2: The social and cultural have a significant relationship with the entrepreneurial intention of engineering students.

Financial Growth

According to Barba-Sánchez and Atienza-Sahuquillo (2018), financial security is seen as a safety symbol and guarantee for an individual's good standard of living. Lexicon mentioned that the economic of entrepreneurship describes how economic conditions and incentives affect entrepreneurship as well as how the entrepreneurs actions in turn affect the broader economy. Entrepreneurship combined with land, labor, natural resources and capital that can make profit in the context of economics.

In this case, the students need to make the decision on how to start-up their own business with personal saving. Personal saving is when a person rather than organization saves money or capital to spend or invest later (Lexicon). From personal saving, the students can control themselves to avoid to purchase not important things and make them more discipline to achieve their ambition to become an entrepreneur. Without seed money or personal saving, maybe they should take a long time to start-up the business. We propose the hypothesis.

H3: The financial growth have a significant relationship with the entrepreneurial intention of engineering students.

RESEARCH FRAMEWORK

Fig. 1 shows the research framework of the Effects of the Entrepreneurial Ecosystem on engineering Students. The researcher wanted to investigate the hypotheses of each three independent variables such as entrepreneurial education, social and cultural and financial growth whereby they can effect on dependent variable which is engineering student.

RESEARCH METHODOLOGY

POPULATION AND SAMPLE SIZE

This research is narrow down to the fourth year engineering students in UTeM. In 2018/2019 session, the population of forth year engineering students in UTeM are 1672 students. The researcher collected the respondents of data from UTeM portal which is Sistem Maklumat Pasca Siswazah (SMP).

Table 3.5 below shows the table of Krejcie and Morgan (1970) to determine the sample size of the population. Based on the table, the researcher assumes the sample size, S for this research would be 313 respondents because the population, N of forth year engineering students are 1672 students. After that, the researcher distributed the questionnaire to them to collect the data.

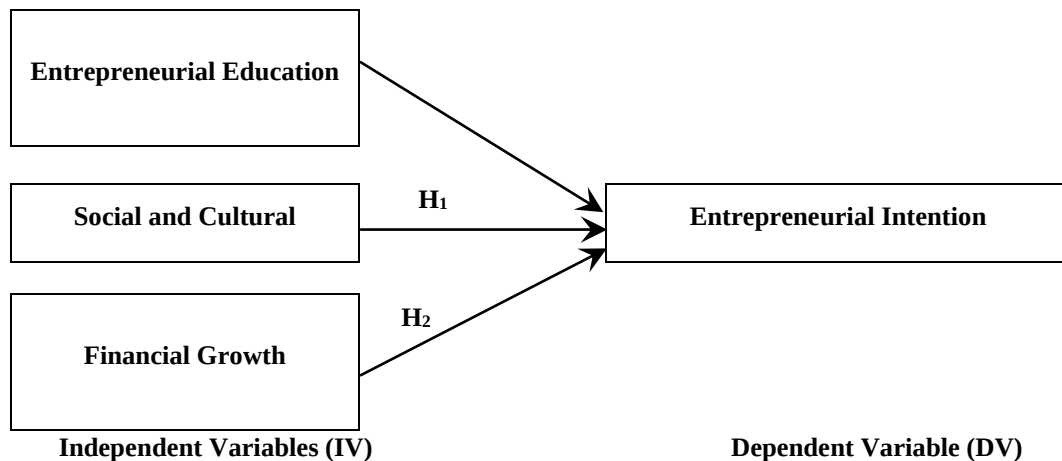


Fig. 1. The Proposed Research Framework

In order to obtain the desired results, the researcher implemented survey strategy for this research by distributing a set of questionnaires to respondents. The questionnaire consists of close-ended questions that were the set of questions that offer limited alternative answers as well as the respondents need to choose the one closest answer from their point of view. Answers to the closed-ended questions are easier for the respondents as the answers are classified into standardized groupings to simplify the data analysis and interpretation process.

Because at a particular time the research involves studying particular phenomena, this research will be a cross-sectional study. The purpose of this research, as mentioned in previous chapters, is to investigate, examine and understand the effects of an entrepreneurial ecosystem on students of UTeM engineering becoming entrepreneurs. The researcher has limited time to conduct this research so the researcher must start collecting data early in order to avoid some errors on the results. The researcher used the survey technique through online and manually to distributes the questionnaires.

PILOT TEST

The researcher had justified the pilot test purpose in the previous chapter. This pilot test was done prior to the actual research. It was involved 30 respondents from this research to identify the reliability of the questionnaire. Table I shows the reliability statistics of the pilot test for this research. The value of Cronbach's Alpha for all of the variables is 0.928. This result passed the pilot test because the coefficient range scored higher than 0.6. It indicated higher degrees of internal consistency.

Table I. Reliability statistic for 30 respondents

Construct	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Entrepreneurial Education	0.844	0.849	8
Social and Cultural	0.821	0.822	6

Financial Growth	0.823	0.824	5
Entrepreneurial Intention	0.769	0.766	6

According to Table I, this pilot test's result is regarded as excellent because all the items in the questionnaire are valid and reliable. Therefore, all of the questions can include in the actual questionnaire and can distribute to the target respondents. Table I shows the value of Cronbach's Alpha for the pilot test of entrepreneurial education is 0.844. This result passed the pilot test and is considered as good. Table I shows that the social and cultural pilot test value of Cronbach's Alpha is 0.821. This result passed the pilot test and is considered as good. Refers to Table I, financial growth's pilot test value of Cronbach's Alpha is 0.823. This result passed the pilot test and is considered as good. Table I shows a value of 0.769 for the pilot test of engineering students for Cronbach's Alpha. This result passed the pilot test and it is considered as acceptable.

RESULTS

The data show that 52.4% of males are out of 313 respondents, while 47.6% are females. The highest number of respondents contributing to this research is male and this research has dominated them. The data show that the highest frequency distribution of respondents is range of ages of 22 to 25 with the total percentage being 83.1% of respondents. Furthermore, the range of age of 26 to 29 and 30 to 33 are 12.5% and 4.2% respectively. The lowest frequency distribution of the respondent is in the age range of above 33 years with 0.3% of the respondents. The data show that Malay consists of 59.7% of respondents is the highest frequency distribution of respondent race followed by 29.1% of respondents from Chinese and 5.8% of respondents from other races. Next, Indian is the lowest frequency distribution of respondents which consists of 5.4%. Table II shows that FTKEE with a total percentage of 16.9% is the highest frequency distribution of respondents. In addition, other five engineering faculties such as FKM, FKP, FKE, FKEKK and FTKMP shared the same overall percentage of 16.6 % where respondents' frequency distribution is 52 respondents respectively. The researcher aimed to distribute the same total of the questionnaire to each faculties, with the exception of FTKEE, which had one additional respondent for 313 respondents.

Descriptive analysis used to provide brief descriptive coefficients summarizing the survey result data set. In this analysis, the researcher concentrated on independent variables and dependent variable. It used mean value to explain the central tendency of variables while measuring the distribution of data using the standard deviation value.

Table II. Descriptive Statistics of Independent Variables and Dependent Variable (Source: Primary data from output SPSS)

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Entrepreneurial Education	313	2.50	5.00	4.1242	.50647
Social and Cultural	313	2.50	5.00	4.1374	.52598
Financial Growth	313	2.40	5.00	4.1776	.47489
Engineering Student	313	2.67	5.00	4.1225	.50328
Valid N (listwise)	313				

Table II shows the descriptive statistics of independent variables and dependent variable. The dependent variable for this research is engineering student while independent variables are entrepreneurial education, social and cultural and financial growth. The data show the mean value of entrepreneurial education is 4.1242, meaning that most respondents responded positively to the standard deviation near scale 4 with a value of 0.50647. In addition, the mean value of social and cultural had also responded positively to scale 4, meaning 4.1374 with a standard deviation of 0.52598 compared to the mean value of financial growth, meaning 4.1776 with a standard deviation of 0.47489. Besides, the mean value of engineering student is 4.1225 and the value of standard deviation is 0.50328. The highest mean score from the analysis is financial growth, which is the result that most respondents agree that financial growth has a positive effect on Entrepreneurial intention among engineering students.

Pearson Correlation Analysis refers to a technique used to investigate the relationship between independent variables and variable dependence. The correlation coefficient (r) of Pearson is used to measure the association strength between the two variables. Pearson correlation coefficient was computed to assesses the relationship between the entrepreneurial education with engineering student. There was a positive correlation between the two variables, $r = 0.529$, $n = 313$, $p = 0.000$. A Pearson correlation coefficient was computed to assesses the relationship between the social and cultural with engineering student. There was a positive correlation between the two variables, $r = 0.518$, $n = 313$, $p = 0.000$. Table II shows a Pearson correlation coefficient was computed to assesses the relationship between the financial growth with engineering student. There was a positive correlation between the two variables, $r = 0.512$, $n = 313$, $p = 0.000$.

MULTIPLE REGRESSION ANALYSIS

Multiple Regression Analysis described the relationship between multiple independent or predictor variables and a dependent or criterion variable. A dependent variable is modeled as a several independent function with corresponding coefficients. It means a technique used by predictors to predict the unknown variable value.

Table III. Model Summary, ANOVA and Coefficients (Source: Primary Data from output SPSS)

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.608a	.370	.364	.40139		
Predictors: (Constant), Financial Growth, Entrepreneurial Education, Social and Cultural						
ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.243	3	9.748	60.501	.000b
	Residual	49.785	309	.161		
	Total	79.028	312			

a. Dependent Variable: Engineering Student

b. Predictors: (Constant), Financial Growth, Entrepreneurial Education, Social and Cultural

Table III shows a multiple regression analysis was calculated to predict engineering student based on the entrepreneurial education, social and cultural as well as financial growth. A significant regression equation was found ($F(3,309) = 60.501$, $p < 0.000$), with an R^2 of 0.370.

The researcher used multiple regression analysis in this research to test the hypotheses. The relationship between a dependent variable and an independent variable can be investigated. The researcher used this method to analyze independent variables and dependent variable hypotheses.

Table IV. For Guidance on Interpreting Hypothesis Testing

Coefficients ^a							
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics
		B	Std. Error	Beta			Tolerance VIF
1	(Constant)	1.149	.223		5.144	.000	
	Entrepreneurial Education	.254	.062	.256	4.103	.000	.524 1.909
	Social and Cultural	.193	.061	.202	3.145	.002	.496 2.017
	Financial Growth	.269	.061	.254	4.409	.000	.613 1.631

a. Dependent Variable: Engineering Student

Table IV shows the result of regression indicated the p-value for entrepreneurial education is 0.000 which is $p < 0.05$ that means it is a significant value. There was a significant positive relationship between entrepreneurial education with engineering student. Hence, H_0 rejected while H_1 is accepted. Table III shows the result of regression indicated the p-value for social and cultural is 0.002 which is $p < 0.05$ that means it is a significant value. There was a significant positive relationship between social and cultural with engineering student. Hence, H_0 rejected while H_2 is accepted. Table III shows the result of regression indicated the p-value for financial growth is

0.000 which is $p < 0.05$ that means it is a significant value. There was a significant positive relationship between financial growth with engineering student. Hence, H_0 rejected while H_3 is accepted.

CONCLUSION AND RECOMMENDATION

The first research objective is to examine the main effects of entrepreneurial ecosystem on Entrepreneurial intention among engineering students. The researcher had conducted Multiple Regression Analysis in order to obtain this research objective result. By using this method, it will help to determine the main effect of entrepreneurial ecosystem on Entrepreneurial intention among engineering students easily when using the beta value from coefficient table. Based on the result, the biggest value of beta is indicated as the main effect of entrepreneurial ecosystem on Entrepreneurial intention among engineering students.

The highest value of beta for this research is entrepreneurial education with indicating the beta value of 0.256 followed by financial growth with indicating the beta value of 0.254. Meanwhile, the lowest value of beta for this research is social and cultural with indicating the beta value of 0.202. Therefore, the researcher can conclude that entrepreneurial education is the main effect of entrepreneurial ecosystem on Entrepreneurial intention among engineering students. This finding was supported by Jarrar and Anis (2016) where they found that the majority of engineering students agree that entrepreneurial education significantly effect to them in which it can help to improve the core engineering skillset.

The second research objective is to determine the relationships between the effects of entrepreneurial ecosystem with Entrepreneurial intention among engineering students. The researcher had conducted Pearson Correlation Analysis in order to obtain this research objective result. By using this method will help to identify the relationship as well as measure the strength of association between two variables.

The interpretation of correlation between independent variables and dependent variable. Based on the table, the result shows the values of the correlation coefficient range from 0.529 to 0.659. There is a moderate relationship between entrepreneurial education with engineering student with the value of the correlation coefficient is 0.529 as the moderate positive correlation.

Besides, the result also show that there is a moderate relationship between social and cultural with engineering student with the value of correlation coefficient is 0.659 as moderate positive correlation. Other than that, relationship between financial growth with engineering student is also moderate relationship with the value of correlation coefficient is 0.549. It indicates that the two variable also has a moderate relationship.

Therefore, all of the independent variables are moderate relationship with the engineering student.

LIMITATION OF STUDY

First of all, the researcher targeted the respondents from the forth year or final year engineering students in UTeM for this research. The researcher only targeted them because limited of duration causing the researcher could not to collect the data from all levels of engineering students in UTeM. This is because of the researcher needed to be completed this Final Year Project (FYP) in approximately in nine months. Besides, the researcher also had constraints of financial to manage as well as handle this research such as print out the survey questionnaire and hardbound the thesis.

RECOMMENDATIONS FOR FUTURE RESEARCH

Some recommendations to propose on this research for the future. The researcher suggests different methods in conducting this research. The research used quantitative method in the current study to obtain data, but the researcher's knowledge is limited by asking for their behavior and making the personal assumption based on the survey responses when using this method. The research should use a qualitative method such as interview or focus group to enable direct interaction with the respondents for future research. Thus, face-to-face communication with respondents in a position to avoid misunderstanding and any doubts.

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