PERSONALITIES FACTORS TOWARD ENGINEERING ENTREPRENEURIAL ATTITUDES

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A project report submitted in partial fulfilment of the requirements for the award of Bachelor of Engineering (Honours) Civil Engineering

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DECLARATION

I hereby declare that this project report is based on my original work except for citations and quotations which have been duly acknowledged. I also declare that it has not been previously and concurrently submitted for any other degree or award at UTAR or other institutions.

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APPROVAL FOR SUBMISSION

I certify that this project report entitled "**PERSONALITIES FACTORS TOWARD ENGINEERING ENTREPRENEURIAL ATTITUDES**" was prepared by **ONG WEI HENG** has met the required standard for submission in partial fulfilment of the requirements for the award of Bachelor of Engineering (Honours) Civil Engineeing at Universiti Tunku Rahman.

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ABSTRACT

Nowadays, entrepreneurship is the major factor that can drive the world economic growth and create more jobs opportunity in order to reduce the unemployment rate. A healthy and good society can only emerge when countless entrepreneurial activities are carried out continuously. As a developing country, Malaysia is focusing on entrepreneurship to restore and stabilize its economy. There are undeniable benefits to be an entrepreneur in Malaysia. One of the benefits of doing so is that it can cope with Malaysia's rising unemployment rate and bring job opportunities to fresh graduates especially the engineering students. Therefore, entrepreneurial attitude among engineering students in public and private universities will be the title in this study. Past literature has reported that a person's entrepreneurial attitudes determines whether he or she can successfully set up a new company and participate in business activities. Specific personality traits enable individuals to act like entrepreneurs and conduct entrepreneurial activities which including but not limited to locus of control, risk-taking and need for achievement. Therefore, this study aims to investigate the personality factors toward entrepreneurial attitude among engineering students in public and private higher education institution. This study was conducted based on three public and three private universities in Malaysia. The research data were collected by questionnaire survey and the results shows the engineering students with entrepreneurial attitude in public universities are more toward need for achievement traits while the engineering students in private universities are more toward locus of control traits.

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LIST OF SYMBOLS/ABBREVIATIONS

MOHE	Ministry of Higher Education
AUSMAT	Australian Matriculation
UPSR	Ujian Pencapaian Sekolah Rendah
SSTs	Self-services technologies
TRA	Theory of Reasoned Action
TPB	Theory of Planned Behavior
SPSS	Statistical Package for the Social Sciences
VIF	Variance Inflation Factor

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LIST OF SYMBOLS / ABBREVIATIONS

α	Cronbach's alpha coefficient
r	Pearson's coefficient
r_s	Spearman's Rho Rank coefficient
VIF	Variance Inflation Factor
X	Independent Variables
Y	Dependent Variable
α	Regression Constant
β	Beta Coefficients
DV	Dependent Variables
IV	Independent Variables

CHAPTER 1
INTRODUCTION

1.1 Introduction

In this era globalism, Malaysia had focused on nurturing the presence of young generation in every section such as law executive field, engineering field, medical field, entrepreneurial field etc. Malaysia had focused on nurturing in the young age was because the young generation can be the critical agenda of Malaysia's economic growth due to youth-based entrepreneurship is seen as an advocated for small or medium enterprise development (Petrov, 2013). As times change, it was essential to keep innovating in every field to improve economic efficiency and create more jobs for the national. Indirectly, it assists in improving local living standards and developing the economy of the area, city and country (Pretheeba, 2014).

Since then, the engineering institutions had developed the entrepreneurship courses for the engineering students to cultivate the entrepreneurial attitude (Couetil *et al.*, 2012). By comparing the business students and engineering students, there are significant shows that the business students will tend to a higher chance to touch up the entrepreneur field. In contrast, the engineering students will seek for the engineering job, which is away from the entrepreneurship (Kazeem and Asimiran, 2016). Therefore, it stated that engineering students required lower entrepreneurial mindset, attitude and behaviour due to lack of entrepreneurship programmed in engineer's course (Petrov, 2013). Eresia and Gunda (2015) also conducted a study, which showed that the engineering students tended to lower entrepreneurial attitude and intention regardless of their university. For explaining this situation, the engineering students will more manage to more secured way as a salary's employee rather than taking-risk for starting a business (Gurbuz & Aykol, 2008).

However, there would be some changing between the young generation entrepreneur and old generation entrepreneur. Based on the research of Eresia, Shaun and Jean (2016), it shows that the young generation tended to high probabilities of taking-risk compared to the old conventional age. Therefore, the percentage of the young generation being entrepreneur will higher than the old

generation entrepreneur. Based on the research which experimented on the other university implemented the entrepreneurship courses will heavily influence the student's attitude and intention towards entrepreneurial (Coduras et al., 2008). According to Byers (2013) said, the entrepreneurship was a new way for fresh graduates to start a business, so the implementation of entrepreneurship education was increasing rapidly.

Indeed, this research will be focusing on the personality factor that affecting the engineering entrepreneurial attitude on public and private higher education institutions. The cultivation of entrepreneurial attitude needs many factors such as environment, external, social, personality and also the educational.

1.2 Problem Statement

Self-employment among young generation are getting significance in 20th century. Malaysia will face jobs competitions among young graduates as the job opportunities are getting lesser. This was because Malaysia was a small country compared with other nation, more jobs would be getting eliminated by the advancement of the fifth industrial revolution which makes people harder to find employment (Chan et al., 2009). Figure 1.1 illustrates the declination of job opportunities from 2016 to 2018

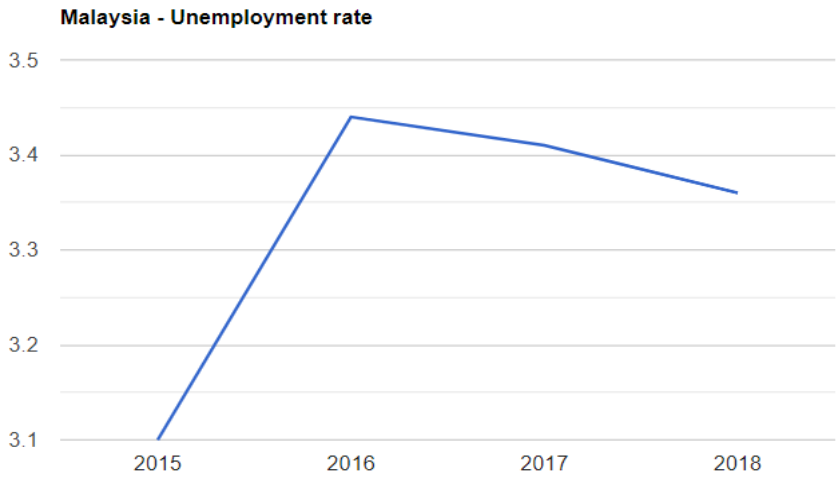


Figure 1.1: Unemployment Rate in Malaysia from 2015 – 2018

Source: (The World Bank)

The data shows significant unemployment rate was gradually increased by the year which from 3.1% (2015) to 3.35 % (2018). Indeed, Malaysia's unemployment rate fell 0.05% in the year 2019, it is still considered high compared with the past (Refers to Figure 1.2).

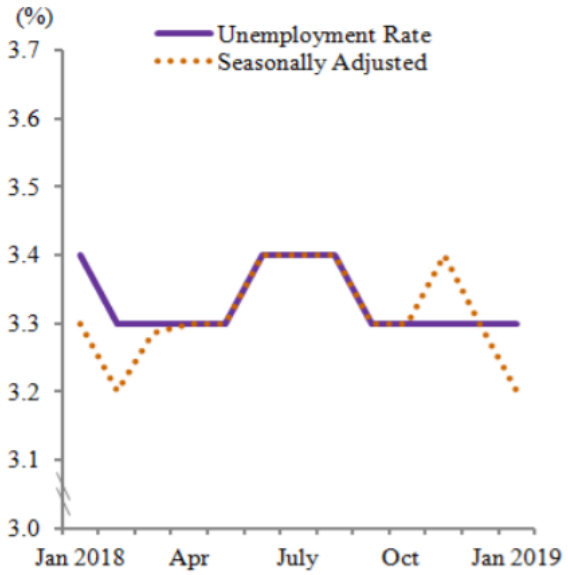


Figure 1.2: Unemployment Rate in Malaysia in Year 2019

Statistics of the labor force in Malaysia (2019) had shown the unemployment rate remains at 3.3% in January 2019, as shown in Figure 1.2. The main reason is due to the increasing demand for labor in the market. For solving this problem, Malaysian's government implemented some policies such as entrepreneurship education to encourage the young generation towards entrepreneurial.

Despite the huge potential of entrepreneurs in the Malaysian market and the greater support and help from the government in education, funding, training and consulting services, a large number of young people end up their businesses with a high failure rate are still existing. As evidence, the Central Bank of Malaysia Report (2019) consists of a huge number of statements showing that the average number of bankrupt enterprises in Malaysia was 1668 from 1998 until 2019. These bankrupt companies included a small number of companies founded by young people. Only a small portion of the youth entrepreneurs survives in the market due to their entrepreneurial attitudes and talents (Badariah *et al.*, 2017). In today's society, it was common to see that many young

entrepreneurs can only survive with a short period in Malaysia market because of maturity, insufficient of human network and lack of ability to manage enterprise resources. In fact, to be successful in business, the younger generation must have some ability to manage their own business resources. Young entrepreneurs need talented and skilled environmental resources to be enhanced and developed opportunities for new markets and resource management as not all of the people having the ability to seize opportunities (Zain & Ng, 2006).

However, this study found that engineering students lack understanding of entrepreneurship education and misunderstanding of the meaning of courses which leads the students would not be engaged to entrepreneurship and having low willingness of engineering students to start a business (Wu & Wu, 2008). According to the researchers stated a phenomenon which called as "tunnel vision" that occur at the engineering student (Couetil & Wheadon, 2013; Tan *et al.* ,2018). It means that the vision of engineering students was limited to small aspects of the technical spectrum. Engineering students are less willing in businesses line due to lack of interest in the career path of business (Abbas, 2013).

In order to encourage the engineering students towards entrepreneurship, it is necessary to construct their attitude which towards entrepreneurship as part of their permanent personality. Therefore, the Malaysia government is implementing entrepreneurship education into higher institutions in order to reshape the student's attitude (Ahmed *et al*., 2010). If a person starts a business in a casual way, no matter how hard to try, the person will never be more successful than someone with an entrepreneurial attitude. Therefore, in order to construct the entrepreneurial attitude, personality factors played as the main role in affecting a personal attitude (Shaver & Scott, 1991). Cherry (2016) was defined the personality as the individual's continuous thinking, behavior and emotional pattern which interrelated with the personal attitude. For further details of the personality factors were consisting of many variations of the traits such as risk-taking, self-efficacy, locus of control, need for achievement etc. These factors can drive the students or people having the attitude towards entrepreneurship and entry to the business market (Karabulut, 2016). Entrepreneurial tendencies tend to be associated with personal characteristics

with the need for achievement, risk-taking and locus of control that will be influenced by education programs.

In this study, the personality factors affecting entrepreneurial attitude among engineering students in public and private universities in Malaysia will be discussed. This main study research on personality factors from three aspects which are the locus of control, risk-taking and need for achievement.

1.3 Aims and Objectives of the Study

This study was mainly focused on the personality factors that will impact the entrepreneurial attitude among engineering students on public and private higher education institution. Comprehend the personality factor will be aimed in this research. This study divides the personality factors into three. There are the locus of control, risk-taking and need for achievement. Therefore, three main objectives aim to:

i. Investigate the Personality Traits (Locus of Control) and the entrepreneurial attitude among engineering students.
ii. Investigate the Personality Traits (Risk-Taking) and the entrepreneurial attitude among engineering students.
iii. Investigate the Personality Traits (Need for Achievement) and the entrepreneurial attitude among engineering students.
iv. Investigate the differences between the Personality Traits and Entrepreneurial Attitudes of Engineering Students in Public and Private Higher Education Institutions.

1.4 Research Questions

The research questions are as follow:

i. Is there any relation between Personality Traits (Locus of Control) and the entrepreneurial attitude among engineering students?
ii. Is there any relation between Personality Traits (Risk-Taking) and the entrepreneurial attitude among engineering students?
iii. Is there any relation between Personality Traits (Need for Achievement) and the entrepreneurial attitude among engineering students?

iv. Are there differences between the Personality Traits and Entrepreneurial Attitudes of Engineering Students in Public and Private Higher Education Institutions?

1.5 Scope and Limitation of the Study

The limitation of this study is mainly focusing on engineering students on public and private higher education institution. Therefore, the initial target is not including the other course's students. There are some of the higher education institutions were not offered the engineering programmed, so it will be excluded from the target in this study. Meanwhile, several researchers give different views, and students from different courses have different attitudes towards entrepreneurship. Therefore, the personality among the engineering students has to be the main focusing point in this study. The data collection on the three public and three private universities through the questionnaire and analyzed by the Statistical Package for the Social Sciences (SPSS) Statistics software.

1.6 Significant of the Study

This study has brought many contributions to the development of a young entrepreneur in Malaysia. According to Ridzwan *et al*. (2017), the young entrepreneur as the important support to the country which stimulates the country's economical and also assisting the country move toward a more advanced and prosperous economy in future. In order to be successful, young entrepreneurs must possess many talents and enquired the skills that manage resources wisely. Contrary to popular belief, young people don't see entrepreneurship as a future career choice. Thus, this study has an important guiding significance for universities student's future career path, enabling the students to understand their strength and weakness so as to get better development in the future career. This study also can identify the attitude of the students such as the locus of control trait, risk-taking trait and need for achievement trait, which in turn to help determine the intentions of the business.

The personality factors have been selected as this study, and it can enable society to understand the significance of it, which can heavily influence the entrepreneurial attitude among students. Personality factors can identify what

kind of attitude the students are. For example, the risk-taking trait can determine whether a person likes to venture a new market or likes to do business safely. Therefore, people may know the types of their personalities and also can enhance their weaknesses through this study.

This research also has an important reference of the significance for the implementation of future development policies. By understanding any of the factors that affect students' entrepreneurial attitude, entrepreneurship education course can be implemented into the universities in order to cultivate more young entrepreneurs and stimulate the start-up rate of the new enterprise. Although the government has implemented the entrepreneurial education, the plan was contrary to expectation (Mohamed *et al*., 2012; Mustapha & Selvaraju, 2015). Therefore, the government can implement a new teaching method or advanced equipment in order to attract more students approached entrepreneurship (Ooi *et al*., 2011).

Since most of the universities' engineering students enquired the phenomenon – "Tunnel Vision" (Couetil & Wheadon, 2013) which means only focusing on the subject study and without participating in any extra-curricular, therefore, this study can signify to using some elements of the extra-curricular mix into the study in order to cultivate the engineering student's leadership, behavior and attitude.

The unemployment situation in Malaysia was gradually increased due to the huge demand of the population, and further information was declared in the problem statement. There were consisting of many competitors and fierce competition for jobs, and only a few graduates can find stable jobs. Thus, the only way to solve this problem is to be an entrepreneur (Selvarajah & Meyer, 2011). When there are too much of competitors, there will become a "Red Ocean". Only the people who jump out from the "Red Ocean" into "Blue Ocean" can succeed for long life. Only the "Blue Ocean" can resolve the unemployment issues. Thus, this study is a great significance to stimulate the engineering student's entrepreneurial attitude to get rid of the unemployment problem. At the same time, it helps to improve the standard of living and also contribute to the economic growth of the country.

1.7 Layout of the Report

In the layout of the report section, a brief overview of each chapter is presented. Therefore, all the summaries of each chapter were listed below.

Chapter 1: Introduction

This chapter was focused on briefing the overall of this study which including the introduction, problem statements, research questions, main objectives, scope and limitation of the study, significant of study and outline of the study. The issues in this study which influenced the entrepreneurial attitude among engineering students are determined in the problem statements, and the further details will be discussed in Chapter 2 – Literature Review.

Chapter 2: Literature Review

This chapter was mainly discussed the empirical study in this research, which means the relevant or irrelevant published research that related to this study. It was including the literature review, related theoretical model, hypothesis development and also the research question development.

Chapter 3: Research Methodology

This chapter has mainly discussed the overview of the research methodology in this study. These consist of two types of method, which are the qualitative and quantitative method and select the best method for this study. The survey questionnaire will distribute to three public universities, and three private university in Malaysia and the respondents must be the engineering courses. The collected data will be analyzed and interpreted by using SPSS statistical software. This chapter includes research design, data acquisition methods, sampling design, research tools, measurement structures, data processing and data analysis.

Chapter 4: Research Results

This chapter was mainly focused on introducing research results and discussion. It shows the step and interpret data from the questionnaires and then analyzing

the results to discuss the possibility of data analysis. All of the interpreted data will be presented as a table, graph, charts and figure.

Chapter 5: Conclusion and Recommendation

This chapter was the final discussion and conclusion of this research. All of the finding data and the main results will be discussed in this chapter. Contributions and the limitations of this study have to follow up to achieve the main objectives, and the recommendations will be provided to enable the other researchers improved the information in future.

1.8 Summary

The first chapter in this study was mainly briefing the overall of this research. Build a simply way of concept for understanding about this study, such as the objective, problem statement, significant of the study, limitation of the study, and so on. The following chapter will be more further details in the literature review based on several types of research' statements conduct by past researchers.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

Today, proverbially that the entrepreneurs were the core that brings up the economic and development of the country. The entrepreneurs were playing important roles in every country (Farsi *et al*., 2012). Followed by many researchers, there were concurring that the entrepreneurship had become the key towards the process new revolution of development and economic (Davidsson, 2003; McMullen and Dimov, 2013; Shane and Venkataraman, 2000; Wiklund *et al*., 2011). They were the people who required the skills that anticipated future and current needs and brought quality new product or service to the market. Even though the road to entrepreneurship was risky, barrier and dead ends, there were still existing of someone willing to sets out on such a path. Based on this 20th century, the number of entrepreneurs is getting higher, and most of the people are the graduated engineering students. So, what do the entrepreneurs stand for?

The entrepreneur can be defined as a person who effective control of their business or an enterprise in order to maximize their profits by innovation, strategies, risk-taking etc. The entrepreneur also can be described as the people who keep on finding ways to become more honorable, stronger and successful (Douglas & Shepherd, 2002) However, followed by the research (Shane & Venkataraman, 2000), it states that the entrepreneurship lack of general conceptual framework. In addition, (Shane & Venkataraman, 2000) states that opportunities are the core that directly influenced the exploit of entrepreneurial. Furthermore, there are some of the characteristics of the entrepreneur and their "traits" have been explored by the researchers. There was a quite numerous characteristic that use to defined entrepreneurs such as risk-taking (McClelland, 1965; Palmer, 1971; Welsh and White, 1981), grabbing the opportunity (Shane & Venkataraman, 2000), open-minded (Gedik. S, Miman. M & Kesici. M. S, 2015) and so on. According to the behavior or attitude of the entrepreneurs, they contained many types of character and attitude in order to push them into a successful achievement not only a single of a trait. Therefore, the engineering

students would have higher chances to become an entrepreneur compared to non-engineering students. According to a researcher in the USA, he stated that the engineers have become independent, autarkic, and a self-motivated inventor to all around the world (Yurtseven, 2002).

Over years of investigation by many researchers, they found out the growing rates of the entrepreneurship are getting related to many determinants such as education level, technology, commercial environment, politic and so on so forth (Grilo and Thurik, 2005). All of these determinants are considered as the "Macro-level" factors that stimulate the rises of entrepreneurship. Therefore, a country is getting developed or underdeveloped was heavily influenced by the entrepreneurs. Precisely, before the country becomes more advanced, modern and sophisticated, they have to upgraded and enhanced their institution especially the education level, this is because none of the countries can constantly maintain the economic development for a long lifetime. Therefore, the institution played as the primary role in providing knowledge to keep revolution, innovation to avoid fallback with another country (Ozturk, I. 2001).

2.2 Institution

The institution was a term that as a hot topic widespread to all around the world. The institution can be defined by quite a lot of various meanings. Follow by many researchers, they were from a different perspective and given a different definition to this term. According to Samuel P. Huntington, he stated institution are "stable, valued, recurring patterns of behavior" (Huntington. S, 2006). While according to Geoffrey M. Hodgson, the institution was used to constrain and allowed the behavior of the citizen (Hodgson. G, 2006). However, constrain of behavior will lead out many kinds of possibilities like provided an option to the people to take action or won't. The institution on the different type of field must have its own purpose. If there is not exist the institution, it means freedom is everywhere, and nobody can restrict what they want to do. It can be good or bad. If people behavior or attitude was kindly and nicely, there would be a great thing, and society will be peaceful and safe. However, there is not exist a guarantee that people will keep good conduct or great behavior forever. This is because humans are greed and rapacious (Souza & Adams, 2016). Therefore, there must

have the institution to control and restrict human behavior in order to achieve the balancing of the world. Every country also is the same, which needed the institution to maintained the peaceful of the country.

The institution was getting applied in different areas of the organization or management. For instant, language, traffic, medical, financial, law, politic and others. Different types of institution will bring different contribution to society. Institution play as an important role in every field, for example, the rule of law that uses to constraint people behavior in order to increase personal safety, rule of traffic that helps to control the traffic volume and keep it smooth, rule of education that makes the person differentiate the good things and the bad things. The social institution had been formed, such as a big model due to the combining of all these institutions. If there was absent of any institution, the social institution would not be formed. There were a lot of things that make up by social institutions. Let's list some of the example: your father and your mother marriage together and birth you to form a family. This is under a social institution. Other than that, you begin your life by start learning languages, knowledge, communicate and abilities through the education institution and religious institution provides an identity and constructs your behavior (Razin & Levy, 2007). When you graduate from high school or university, you will start to step in the structure of the economic institution. This institution was you have to face when you were getting a job or starting a business. From now, you can realize that the institution is around and around your life no matter when you were working with your job, walking on a road, watching a cinema. There must be existing some of the institutions that you should follow.

Education institution, it can be count as the essential institution in the social institution. This was because it was involved with every person with the most of the time during the study and learning process. Everyone has to go through it. It acted as the major standard to construct and sharping the people attitude, characteristic, behavior, conduct and others in the most suitable lifetime. The institutions have the responsibilities to teach and educate the young generation and conduct them applied their knowledge to improve society and modernization the country. The person who acquired and applied the

knowledge on the right way will get to be used in society, and they will become an honorable and respectable person (Meyer, 2010).

In Malaysia, education institution was applied, and it was separated into a few of the stages, which are preschool education, primary education, secondary education, post-secondary education and higher education institution. Preschool education was the education for the child while they turn to 3 or 4 years old. The timeframe for preschool education is for 3 to 6 years old children. There was a term that we use to describe preschool education which was the kindergarten. This stage was as a foundation for all of the children to learn to communicate, cultivate interesting, make friends and others. In Malaysia, there were no rules that fixed children must receive educating from kindergarten. The election was based on the parents, but most of the parent will send them to the kindergarten when their child turns to 4 years old. Furthermore, primary education was a stage which consists of 6 years educating for all of the children who at the age of 7. Before proceeding to secondary education, there exists an examination called "UPSR". This examination was as a determinant to all of the students who are 12 years old admitted to secondary education. If the student who obtained a minimum grade C for the Malay subjects in UPSR, they have to attend a one-year class called "Remove" before proceeding to secondary education in Malaysia. Other than that, there will be five years course during secondary education, and it is separate into two stages. There were lower secondary (3 years) and upper secondary (2 years). There was existing a fixed rule that stated all of the people have to receive the educating of primary and secondary education in Malaysia. After finishing the study of secondary education, there will be an election for you to continue higher education institution such as college, university and institute of technology which called polytechnic (Education System Malaysia, 2015).

In order to keep up with the development of the century, a large amount of the people was started to continue their study in the higher institutions. This was due to the changing of the society; knowledge has been updated as the machine. If not doing so, they would be quickly fallback with this society. Moreover, receiving higher education will also help the students to create their professional fields and also sharping their career in the future. The higher

institution was taking up a crucial role in providing the opportunity to assist them in the future (Meyer, 2010).

2.2.1 Higher Education Institution

In this 20th century, higher education was getting played as a main agenda issued. In this economic development society, the highly educated and skilled workforce were highly demanded in order to increase and improved the profit and productivity of the market. Therefore, a higher education institution system was made an uncountable contribution to country competitiveness. The government also encourage the development of higher education institution to achieve an excellent outcome in the Southeast Asia region (Ministry of Higher Education, 2007).

Higher education institution was included in post-secondary education and tertiary education. Both of the education was the institution that after the secondary education institution in Malaysia. Post-secondary education can be called as "Pre-University" in Malaysia. There were several choices that allowed the students to continue their studies. There were existing Form 6 or the Matriculation as the post-secondary education for the students who want to enter the public universities in Malaysia. Nevertheless, there were consisting of other choices which were the British A-Level programmed, Australian Matriculation (AUSMAT), Foundation programmed and Diploma Programmed for those students who wanted to entry private universities. All of the students have to pass through pre-secondary education before proceeding to tertiary education.

Tertiary education was involving colleges, universities, Polytechnics and MARA Advanced Skills Training Institutes (Education System Malaysia, 2015). Among the higher education institution, it involved two types of institution, which was a public higher education institution and private higher education institution. Indeed, both of the institutions are from different sectors. However, the objective of both of them was the same, which was to give education to students. Under the forces of globalization today, the generic skill was the most important skill that market needed such as innovative, creative, critical thinking, communicated skill and problem solving (Wong and Hamali,

2006). Therefore, there are two types of higher education institution in Malaysia, which are Public higher education institution and Private higher education institution. These higher education institutions as a placed that provide to students to explore, build and enhance their talents to make significant results to this nation.

2.2.2 Public Higher Education Institution

Public higher education institution can be known as the institution which belonged to the publicly owned or the institution that received the subsidies from the government. This means that the tuition fee of the public universities will be much lower than the private universities due to financial aids (Wan, 2007). Indeed, the public education institution was involving public universities, public college and polytechnics. There were a lot of programmed consisting of these public institutions. For public universities, they normally provided foundation programmed, undergraduate programmed (Bachelor's Degree) and postgraduate programmed (Master Degree and Doctoral Degree). While for the public college and polytechnics, they only provided the diploma programs to students which mean its only offer the diploma certificate for the student who graduates in the public college or polytechnics.

The first phase of the evolution education system in Malaysia was occurring at 1957 to 1970, which after independence years of Malaysia (Zain *et al*., 2017). During this phase, developing knowledge and skill in the agricultural sector was the main objective in education institution (Ahmat,1980, Sirat, 2010). However, the first university in Malaysia, Universiti of Malaya was established and achieved the aims nicely. This result was made as an agenda key to explored and developed the programmed of universities in other fields such as engineering, medical, technical, accounting, and so on (Ahmat, 1980). Therefore, numerous universities were rising sharply in order to cultivate talents to develop in these fields (Sato, 2005).

During the years of 1970 to 1990s, national solidarity were the biggest challenges that we all faced. This was because Malaysia was the one country consisting of many different ethnic groups such as Malays, Chinese, Indians and

other indigenous Bumiputra groups. Because of the disequilibrium in many factors such as Chinese monopolize the businesses market in Malaysia. Therefore, the problem that underlaying of solidarity had arisen. According to Lee (Lee, 2004a), she stated that education was the most critical things that can influence people. It can initiate the financial development in Malaysia to expand the labour market and workforce in purpose to assist the other ethnic who had suffered from poverty and backwardness to achieve the social balanced (Selvaratnam, 1985 & Lee, 2004b). Indeed, achieving the social balanced would bring along the opportunity that leads the ethnic to unite.

From years of 1990 until the present, this stage can be called the "Transformation Stage". This is due to the proposal of the Ninth Malaysia Plan, which proposed by the Ministry of Higher Education (MOHE). This purpose is to make Malaysia become Excellence in Higher Education by 2020 through the developing of higher education for Public and Private Higher Education. In order to achieve this policy, more and more universities were getting arisen out in Malaysia to improving the education level of the whole country. The first university in Malaysia was the Universiti Malaya (UM) which established in 1962. Follow by the established of UM, Universiti Sains Malaysia (USM) was come into existence in 1969. These two public universities were established during the first phase of the education system.

Other than that, there were a lot of universities established after the second phase of the education system in Malaysia and all of it was listed in Table 2.1.

Table 2.1: List of Public Higher Educational Institution and Year of Establishment

No.	Name of University	New Name of the Public University	Year Established	Year Renamed
1.	Universiti Malaya (UM)	-	1962	-
2.	Universiti Sains Malaysia (USM)	-	1969	-

3.	Universiti Kebangsaan Malaysia (UKM)	-	1970	-
4.	Universiti Pertanian Malaysia (UPM)	Universiti Putra Malaysia (UPM)	1971	1997
5.	Universiti Teknologi Malaysia (UTM)	-	1975	-
6.	Univerisiti Islam Antarabangsa Malaysia (UIAM)	-	1983	-
7.	Universiti Utara Malaysia (UUM)	-	1984	-
8.	Universiti Malaysia Sarawak (UNIMAS)	-	1992	-
9.	Universiti Malaysia Sabah (UMS)	-	1994	-
10.	Maktab Penguruan Sultan Idris	Universiti Pendidikan Sultan Idris (UPSI)	1997	-
11.	Kolej Universiti Islam Malaysia (KUIM)	Universiti Sains Islam Malaysia (USIM)	1998	2007
12.	Kolej Universiti Sains dan Teknologi Malaysia (KUSTEM)	Universiti Malaysia Terengganu (UMT)	1999	2007
13.	Institut Teknologi MARA (ITM)	Universiti Teknologi MARA (UiTM)	1999	1999
14.	Kolej Universiti Teknologi Tun Hussein Onn (KUiTTHO)	Universiti Tun Hussein Onn Malaysia (UTHM)	2000	2007
15.	Kolej Universiti Teknikal Kebangsaan Malaysia (KUTKM)	Universiti Teknikal Malaysia Melaka (UTeM)	2000	2007

16.	Kolej Universiti Kejuruteraan dan Teknologi Malaysia (KUKTEM)	Universiti Malaysia Pahang (UMP)	2002	2007
17.	Kolej Universiti Kejuruteraan Utara Malaysia (KUKUM)	Universiti Malaysia Perlis (UniMAP)	2002	2007
18.	Kolej Ugama Sultan Zainal Abidin (KUSZA)	Universiti Darul Iman Malaysia (UDM)	2006	2007
19.	Akademi Tentera Malaysia (ATMA)	Universiti Pertahanan Nasional Malaysia (UPNM)	2006	2007
20.	Universiti Malaysia Kelantan (UMK)	-	2006	-

Source: (Ministry of Higher Education, 2007); (Goi and Goi, 2009)

All of these universities are the public universities in Malaysia, and also all of it was the not-for-profit university. Due to the expansion of the university's development, Malaysia had become an education hub in South East Asia (Grapragasem, Krishnan & Mansor, 2014). Due to the high capacity of the student demands the public higher education institution and the public universities unable to handle it. Therefore, the government established the private higher education institution for the rest of the students who enable to participate in public universities.

2.2.3 Private Higher Education Institution

The private higher education institution was a kind of institution that similar to the public higher education institution but from different sector. The main difference between both of the institution was the income-dependent from which segment. For public higher education institution, all the people know that the fund was subsidized by the local government. However, there was not any public fund for the private higher education institution. Indeed, the private

higher education institution was not any relationship with the government. According to Marginson (2007) suggested that higher education was not totally as public or private. Because the public institution will have the chance to produce private goods and the private institution will produce public goods also.

Likewise, private higher education institution also comprises of the private university, private university-college, private college, and so on so forth. Nevertheless, the private university also had the same objective as the public university, which was giving education to students. But the private university was offering the undergraduate and postgraduate programmed and the private college offer the diploma programmed while the public university-college was combining all of the programmed together which got an offer for the certificate of diploma and degree programmed.

In the 1970s, ethnic-based quota system had accomplished in the public university and caused the high demand for private higher education by the other ethnic. The ethnic-based quota system meant that the enrollment of the student in public higher education institution is based on ethnic (Lee, 2005; Lee, 2012). The Bumiputra will get a higher chance to enroll to the public university or other public higher education institution compare with other ethnic. For example, there was around 90% of Bumiputra introduced to the Matriculation college and MARA Junior Science Colleges in Malaysia during 2000 and 2002. (The Star, 10 Aug 2004). Therefore, the private higher education institution was established due to the high capacity of the non-bumiputra and the public higher education institution cannot handle them. The first private colleges are established by a group of people which academics from University of Malaya and Institute Technology MARA (Tan, 2002). Therefore, numerous of the private universities are arisen out during this period.

After the risen of a private institution, Dr Mahathir Mohamad proposed an education plan for the local private higher education institution, which was the twinning programmed. It consisted of many types of model, such as a one-year study in a local and 2-year study in a foreign country (1+2). This type of strategy was very effective in attractive student to join their programmed in those private universities. This was such a win-win solution; students gain an education with interesting and maximize the profit of the private university. This

trend was gradually increasing until the 1990s in Malaysia, and the economic boom had happened. This incident was not only caused by the dramatical increase of private university but also caused by the increase in population, rising income of the citizen, sales increase and so on (Ayob & Yaakub, 1999; Tan, 2002). At the same time, the increasing of the private university in Malaysia also attract numerous such an unimaginable number of foreign students (Ghazali & Kassim, 2003).

The private sector-funded universities and branch campuses of foreign universities were allowed to establish in Malaysia based on the Education Act, 1961. The first private university which founder was Malaysian, it namely Multimedia University and established in 1997. (3+0) programmed was implement into private universities in Malaysia during 1998. This programmed was for foreign students to study their whole degree studies in Malaysia and without practice in a foreign country (Said, 2002). The private higher education institution in Malaysia had been classified into five categories. First was the private university being construct by a large corporation and closely with the government. Secondly was established by public listed corporations, third was established by the political parties, forth was independent private colleges, and the last one was the foreign universities.

The developing of private universities was continue until 1996. During 1996, the government decided to cancel off the project of developing private universities in Malaysia. The reason why to cancel off this project is because of giving the opportunity to Malaysian Telecom which established the first private universities (Multimedia University) in Malaysia (Sohail & Daud, 2009; Tan, 2002). Other than that, there were numerous private universities set up by private companies—for example, Petronas Universiti Teknologi and Universiti Tenaga Nasional (Sohail & Daud, 2009). More or less, numerous foreign universities from the oversea were also implemented into Malaysia through the invitation of Minister of Education (MOE). Monash University was the first foreign university set up in Malaysia in 1998, and it is from Australia. After the implement of Monash University, Curtin University, Swinburne University and Nottingham University was follow up and set up in Malaysia (Tham, 2011; Grapragasem, Krishnan & Mansor, 2014).

In the 20th century, Malaysia already became an international education hub due to the development of the higher education institution and attracted quite a lot of foreign student (Chai, 2007). In addition, there are two types of private universities in Malaysia. What were the private university for-profit and not-for-profit? Most of the private university is considered as the for-profit type, which their purpose was not only giving the education to students but also aim to maximize the profit of the university at the same time whereas the private university of non-for-profit was the only intention to giving the education to the students. That's why some of the private universities requiring the tuition fee with very low compared with the other private universities. There were only a few of the non-for-profit private universities in Malaysia.

Both types of universities were bringing a lot of dedication to Malaysia. No matter it's are private or public universities, they cultivated the new generation as the backbone of the country. Especially for the Non-for-profit universities, they offer the course with low tuition fees as giving a chance for all students and pass on the knowledge to all of the students as much as possible. It was because of the contribution of the higher education institution, they as the gatekeeper and leads all of the students toward two major groups in the future career which were non-engineering and engineering. For a clear indication of private higher education institutions, all private higher education institutions were list in Table 2.2.

Table 2.2: List of Private Higher Educational Institution and Year of Establishment

No.	Name of Universities	Date Established	Location
1.	Multimedia University (MMU)	established in 1997	Cyberjaya / Melaka / Johor
2.	Universiti Tenaga Nasional (UNITEN)	established in 1999	Putrajaya / Pahang
3.	Universiti Tun Abdul Razak (UniRAZAK)	established in 1999	Selangor

4.	Universiti Teknologi Petronas (UTP)	established in 1999	Selangor
5.	International Medical University (IMU)	established in 1999	Kuala Lumpur
6.	Universiti Selangor (UNISEL)	established in 2000	Selangor
7.	Open University Malaysia (OUM)	established in 2000	Kuala Lumpur
8.	Malaysia University of Science & Technology (MUST)	established in 2000	Selangor
9.	AIMST University	established in 2001	Kedah
10.	Universiti Tunku Abdul Rahman (UTAR)	established in 2002	Selangor / Perak
11.	Universiti Kuala Lumpur (UniKL)	established in 2001	Kuala Lumpur
12.	Wawasan Open University	established in 2006	Penang
13.	Albukhary International University	established in 2006	Kedah
14.	Al-Madinah International University (MEDIU)	established in 2006	Selangor
15.	International Centre for Education in Islamic Finance (INCEIF)	established in 2006	Kuala Lumpur
16.	Limkokwing University of Creative Technology	upgraded to university college in 2003, and further upgraded to full university status in 2007	Putrajaya
17.	Management and Science University (MSU)	formerly KUTPM which was established in 2001 and upgraded to full university in 2007	Selangor
18.	Asia e University (AeU)	established in 2007	Kuala Lumpur

19.	UCSI University	upgraded to university college in 2003 and further upgraded to full university status in 2008	Kuala Lumpur / Terengganu Sarawak
20.	Quest International University Perak	established in 2009	Perak
21.	INTI International University (IIU)	upgraded to university college in 2006 and further upgraded to full university status in 2010	Negeri Sembilan
22.	Taylor's University	upgraded to university college in 2006 and further upgraded to full university status in 2010	Selangor
23.	Sunway University	upgraded to university college in 2004 and further upgraded to full university status in 2011	Selangor
24.	Manipal International University	established in 2010	Nilai
25.	Perdana University	established in 2011	Selangor
26.	HELP University	upgraded to university college in 2004 and further upgraded to full university status in 2011	Kuala Lumpur
27.	UNITAR International University	established in 2011	Selangor
28.	Raffles University Iskandar (RUI)	established in 2011	Johor
29.	Malaysia Institute of Supply Chain Innovation (MISI)	established in 2011	Selangor
30.	Nilai University	upgraded in 2007 and further upgraded to full university status in 2012	Negeri Sembilan
31.	SEGi University	upgraded in 2008 and further upgraded to full university status in 2012	Selangor

32.	Asia Pacific University of Technology and Innovation (APU)	upgraded in 2004 and further upgraded to full university status in 2012	Kuala Lumpur
33.	Binary University of Management and Entrepreneurship	upgraded in 2004 and further upgraded to full university status in 2012	Selangor
34.	Infrastructure University Kuala Lumpur (IUKL)	upgraded in 2003 and further upgraded to full university status in 2012	Selangor
35.	Asia Metropolitan University	upgraded in 2008 and further upgraded to full university status in 2012	Selangor/Johor
36.	Putra Business School	established in 2012	Selangor
37.	Global NXT University	established in 2012	Kuala Lumpur
38.	MAHSA University	upgraded in 2009 and further upgraded to full university status in 2013	Selangor
39.	International University of Malaya-Wales	established in 2013	Kuala Lumpur
40.	University Malaysia of Computer Science and Engineering	established in 2013	Putrajaya
41.	Universiti Islam Malaysia, Cyberjaya	established in 2014	Selangor
42.	DRB-HICOM University of Automotive Malaysia	established in 2015	Pahang
43.	Asia School of Business	established in 2015	Kuala Lumpur
44.	City University	upgraded in 2010 and further upgraded to full university status in 2016	Selangor
45.	Meritus University	established in 2016	Kuala Lumpur

46.	Universiti Sultan Azlan Shan	upgraded in 2012 and further upgraded to full university status in 2016	Perak
47.	Universiti Islam Antarabangsa Sultan Abdul Halim Mu'adzam Shah	upgraded in 2006 and further upgraded to full university status in 2018	Kedah

Source: (Education Guide Malaysia: 15th edition)

2.3 Non-Engineering

In this era globalization, there were two types of the major field that play their roles in building this society which was the Engineering and Non-Engineering. Non-Engineering can be defined as the individual that does not relate to any technical or engineering knowledge. It can be considered as the individual who had a limited background with engineering (Johnson, 2002). In the past, people will think that the engineering career or medical career will be much more nobleness. However, people nowadays more likely to learn knowledge in another field rather than engineering knowledge due to the changing of society and economy. Therefore, most of the students will tend towards the non-engineering courses. There were some good courses for the non-engineering courses as listed in Table 2.3.

Table 2.3: Types of courses for non-engineering students

No.	Types of Courses	Description
1.	Bachelor of Science	Numerous of degree courses with the knowledge of general science. Example of the courses: ➢ B.Sc. Agriculture ➢ B.Sc. Horticulture ➢ B.Sc. Forestry ➢ B.Sc. IT ➢ B.Sc. Computer Science ➢ B.Sc. Chemistry ➢ B.Sc. Mathematics ➢ B.Sc. Physics ➢ B.Sc. Hotel Management ➢ B.Sc. Nautical Science ➢ B.Sc. Electronics ➢ B.Sc. Electronics and Communication ➢ B.Sc. Biotechnology
2.	Bachelor of Business Administration	Involves in the degree study of commerce and business administration.
3.	Bachelor of Management Studies	Involves in the degree study of traditional management education and elements of Commerce.
4.	Bachelor of Hotel Management	Involves in the degree study for students to deal with the roles and jobs in hotel and travel sectors.
5.	Bachelor of Architecture	Involves in the degree study of design. The design is focused on the exterior design of houses or other buildings.
6.	Bachelor of Law	Involves in the degree study of legal law and gain the knowledge of legal field in different kinds of laws.
7.	Bachelor of Fashion Design and Design Courses	Involves in the degree study in related fields among fashion design or design. Requires innovative ideas to design.
8.	Education and Teaching Courses	Courses which are related with educating or teaching the students to gain knowledge.
9.	Bachelor of Pharmacy	Involves in the degree study in the aspects of biology and medicine.
10.	Marine Field Courses	Involves in the marine engineering courses.

Source: (Kallarackal, 2016)

2.4 Engineering

Science and technology as a tool for the engineer to use and turn it into things that society needed (The Japan Times, 30 June 2015). Everything an engineer creates has advantages and disadvantages such as nuclear power plants can generate a large amount of electric supply for the whole country without pollution, but it would create a hazard disaster to the country if there was an accident occur. Based on the Engineering Accreditation Council (EAC, 2017), it defined the engineering was using the principle of the science to design and develop structures, manufacture, chemical and others operation to maintain and improve the economics of country and safety to life.

Engineering also interrelated to science and society from the past until nowadays. Figure 2.1 shows the relationship between all of it. For example, genetic engineering developed a new technology that allows people to manipulate their own nature; biomedical engineering creates new medical to prevent diseases and extend life, and so on (Johnson, 2010). Nevertheless, some of the researchers stated there was some line that science and engineering should not cross over due to the morality issues such as using the technique to designed human beings or a baby (Berg, 2008). From the perception of Bill Joy (2000), he stated that the technology brings by the sciences and engineering were the threat to humanity in the future due to the advancement of the internet, robotic, nanotechnology and so on. It had the entitled to completely replaced our human in society. It was obvious that the people had been affected by current technology in daily life such as the handphone, internet, electricity etc.

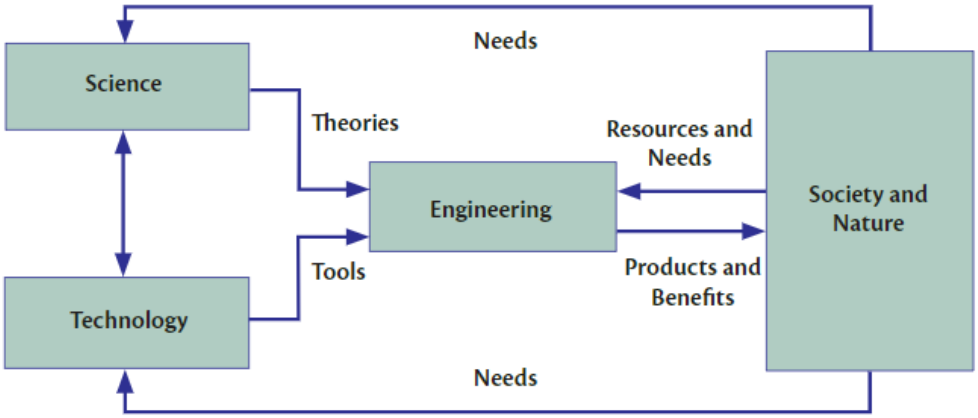


Figure 2.1: Relationship between Science, technology, engineering and society.

Source: UNESCO Report (2010).

Engineering can be called as the ancient professions along with the medical and law in the world. At first, the engineering is consisting of four types of major field and covered with a wide range of related subject which were the chemical, civil, electrical and mechanical (UNESCO, 2010). However, due to the revolution of society, many types of the field were getting explored and researched based on these four major field—all of the engineering fields that like the branches of four major were listed at Table 2.4.

Table 2.4: Fields of Engineering

No.	Types of Engineering	Description
1.	Agricultural Engineering	▪ Engineering theory and applications in agriculture in such fields as farm machinery, power, bioenergy, farm structures and natural resource materials processing.
2.	Chemical Engineering	▪ Analysis, synthesis and conversion of raw materials into usable commodities.
3.	Biochemical Engineering	▪ Biotechnological processes on an industrial scale.
4.	Civil Engineering	▪ Design and construction of physical structures and infra-structure.
5.	Computer and System Engineering	▪ Research, design and development of computer, computer systems and devices.
6.	Electrical Engineering and	▪ Research, design and development of electrical systems and electronic devices.

	Electronic Engineering	▪ Power systems engineering – bringing electricity to people and industry. ▪ Signal processing – statistical analysis and production of signals, e.g. for mobile phones.
7.	Environmental Engineering	▪ Engineering for environmental protection and enhancement.
8.	Water Engineering	▪ Planning and development of water resources and hydrology.
9.	Genetic Engineering	▪ Engineering at the biomolecular level for genetic manipulation.
10.	Fire Protection Engineering	▪ Protecting people and environments from fire and smoke.
11.	Materials Engineering	▪ Research, design, development and use of materials such as ceramics and nanoparticles.
12.	Mechanical Engineering	▪ Research, design and development of physical or mechanical systems such as engines.
13.	Mechatronics	▪ Combination of mechanical, electrical and software engineering for automation systems.
14.	Medical and Biomedical Engineering	▪ Increasing use of engineering and technology in medicine and the biological sciences in such areas as monitoring, artificial limbs, medical robotics.
15.	Military Engineering	▪ Design and development of weapons and defense systems.
16.	Mining Engineering	▪ Exploration, extraction and processing of raw materials from the earth.
17.	Nanotechnology and nanoengineering	▪ New branch of engineering on the nanoscale.
18.	Nuclear Engineering	▪ Research, design and development of nuclear processes and technology.
19.	Production Engineering	▪ Research and design of production systems and processes related to manufacturing engineering.
20.	Software Engineering	▪ Research, design and development of computer software systems and programming.
21.	Transport Engineering	▪ Engineering relating to roads, railways, waterways, ports, harbors, airports, gas transmission and distribution, pipelines and so on.

Source: Source: UNESCO Report (2010)

Most of the countries were already in progress of the fourth industrial revolution which Malaysia was included without exception due to the development of sciences and engineering. Cyberspace was aimed that the technology was looking for. Therefore, engineers are kept on explored and

construct a new system to the society needed trough the development of technology.

2.5 Technology Influences

Does technology make society lives easier and better? There were many researchers had given different perception. Hurwitz and Abegg (1999) had given the perception state that technology had changed all the way of the teaching skill. Students can be easier to understand and learn the knowledge through the technology applied. For example, using the video or picture that was showing in the computer for educating. Although computer technology is heavily influenced in the education field, Lyle (2009) stated that technology also could be implemented to the other field and create an enormously useful. According to Dabholkar (1996), the researcher state that technology contributed to the growth of the self-service. Self-service technologies (SSTs) was the technology that provides to the people who produce and consume itself. For example, the atm machine, handphone voice message and the internet. The SSTs were getting implemented to many enterprises due to the rise of the technology (Meuter *et al*., 2000; Meuter *et al*., 2005).

Many researchers declared that technology is really hard to define. Each of the fields was getting a different understanding of the technology. In the past of the researcher – Reddy and Zhoa (1990), their research had shown that the technology was not easy to define and understand. Based on the researcher Kumar (1999), he declared that the technology was consist of two parts, which were the physical component and the informational components. For the physical components were consist of product, equipment, blueprints and others while informational components consist of quality control, management, production, and so on. For the early concept of the technology was surrounded by the applications that easy to produce and reused (Arrow, 1962).

Besides, the rise in technology leads to the first industrial revolution all around the world. It can be called as "rise of the factory", and it occurs from 1760 until 1830 (Mokyr, 2001). The development of the technology as a surprised to the people at that time. The critical hinge that turns up the industrial revolution was the steam engine which invents by James Watt. Therefore, the

steam engine was stimulated and the growth of the production of the industry. Through the evolution of the time, the fourth industrial revolution was in progress nowadays.

Technology had involved as a part of daily life, and it was implemented in every sector in society today. For example, the nuclear plant generation can supply electricity for the whole country, using the internet can implement into business, blockchain as the security to protect private issues etc. It can easily influence the economics of a country as it is the central point of a country which involved in every sector. Most of the entrepreneurs were grounded on the technology to startup their business, initiating a "blue ocean" and attract the stakeholder from the foreign country. This is why technology play as an essential character in affecting the economics of a nation.

2.6 Entrepreneur and Entrepreneurship

Entrepreneurship was a navigation that leads to competitive benefits which provide the ability of creativity and reformation (Schumpeter, 1939; Bilton, 2007). In most of the country, the critical sources of the economy have relied on Entrepreneurship. The process included all the function, activities and actions together with the awareness of chances and innovation of one body.

"For without the entrepreneur, nothing happens in economic life."

(Cole, 1946)

From this statement of the researcher Cole, it was significantly showing that the position of an entrepreneur in the economic. Indeed, entrepreneurship can be used to describe the people who willing to take the risk in business, open a new market with innovation or the one who insist in own dream, idea and belief (Hebert & Link, 1989). Just like the founder of Apple – Steve Jobs, the spirit of never giving up and willing to take the risk with his own idea for the new products. Personalities traits can be used to further described the entrepreneurship such as locus of control, goal setting, risk-taking, interpersonal skill, perception based on reality, and so on (Scanlan and Flexman, 1980). But from the other scholars – Wilson (2008), entrepreneurship implemented when

there was existing an opportunity to starting a business with sufficient resources whereas Kirby (2004) enlarged the restriction of the entrepreneurship from the opportunity to all sector of the economy.

The entrepreneur can be defined as a team or an individual during seeking the opportunity to start the businesses (Carton et al., 1998; Ganesan et al., 2002; McKenzie et al., 2007). Nowadays, many enterprises are growth to the corporation to raise the capital, market value and attracted investor to invest their company. Therefore, the company from the individual became a team to operate the company. Incontestable, there must be some skills required to assist during organized business (O'Neill, 2014). From the perception of Scanlan and Flexman (1980), managerial, technical and entrepreneurship skill are the three skilled that had been identified to handle a business. MacDonald (1985) stated that the personal attitude and traits as the critical role to success in business. In addition, Frank (2007) the researcher had found out the entrepreneur required the mix up of the personal traits, skilled and the knowledge of business since different people having the different perception to the requirement of the entrepreneurs. According to these researched, it proves that all the skilled can assist the people in becoming the entrepreneur, but the final decision was based on the people who willing to step out from the "glass house".

Then what are the factors that make people having the mindset to become an entrepreneur? According to Kelley (2012), forced the necessity were the significant factors that push people entering the entrepreneur. For an instant, insufficient money for daily life and unemployment in society. According to the research of Kirkwood (2009) also supported that there must be some elements to trigger or attract the people entering self-employment, such as the "push" and "pull" motives. However, Rauch and Fresa (2007) argue that the personalities traits were more effectively to brings people into the business world.

Therefore, identified the objective before starting a business was the basic required and as the initial gate key to setup. As people said, a well begun was half done. A clearly objective can be decided which kind of business to run in the market. However, the final success of the business depended on the entrepreneurial attitude. The attitude was the major criteria to control a person to become entrepreneur compare to others skill or factors (Kelley et al., 2012).

Even though the person required professional skill in every field but lacked entrepreneurial attitude, the business won't for a long time.

2.7 Entrepreneurial Attitude

Based on the psychology perception, attitude is a kind of predisposition towards a thing, person or event. No matter it was toward positive or negative, it will gradually influence people emotional, thoughts and actions (Ajzen,1982; Shaver, 1987). For the early definition for the attitude had been classified into four categories which are the cognitive, affective, motivational and behavioural. For instant,

"a mental and neural state of readiness, organized through experience, exerting a directive and dynamic influence upon the individual's response to all objects"

(Allport, 1935)

However, Krech and Crutchfield (1948) mentioned that attitude was a kind of enduring organization with the four categories. It showed that the meaning of attitude was to keep less enduring due to the change of decade. In the 20th century, the attitude was defined to more simply to understanding which means "like or dislikes" (Eagly & Chaiken, 1993).

In this day and age, the attitude was no longer as enduring and stable as the traditionally assumed. Regarding the results that are shown in now's society, human's attitude would easily influence by minor things. It could be some word, some bad things, some stress. However, some researchers argued that the measurement for the attitude could be existing some errors (Schuman & Presser, 1981). Schwarz & Strack (1991) also stated a similar statement because the attitude measurement was in accordance with the assessment judgement to the respondents in any information when the people were asking. Therefore, the traditional concept of attitude not suitable be used to further analyses the human cognition and behavior. But the other researchers try to maintain the traditional concept of attitude by using the method which was asking a various question to the people with a stable attitude (Lord & Lepper, 1999). Wilson (1998) the researcher had proven that the people could be holding with varied attitude to

one object, people or places at the same time. Since there are many kinds of attitudes and each type of attitude can directly influence an individual thought, talk and action. Hence, an entrepreneurial attitude would be played as the main role to decide the people, whether to become an entrepreneur.

By right for the entrepreneurial attitude can be defined as the measurement of the achievements, innovation, personalities, self-efficacy and others, which heavily influenced an individual to become an entrepreneur (Ajzen, 2002). In fact, the entrepreneurial attitude had been classified into two types by the scholars. First, the entrepreneurial attitude was recognized as an individual's feeling, emotional and idea toward entrepreneurship (Schultz & Oskamp, 1669; Ajzen, 1991). Secondly, the attitude was regarding three dimensions and being as the starting point for four types of scale. Affection – the emotional of an individual, cognition – the belief of an individual and the conation – the behavior of an individual was the three dimensions of the attitude. The four types of scales consist of the achievement, innovation, locus of control over the business results and the self-esteem in business (Robinson, 1991). The other researcher – Lunnan (2006) had a different perception of entrepreneurial attitudes. There were two important elements that represent the entrepreneurial attitude which was the ability to seeking business opportunity and the ability to calculated risk. Even though the risk-taking was the traits which the entrepreneur required, but the ability of risk calculated also have been considered to avoid the unnecessary losses. Opportunity recognition also very crucial as it can allow an individual to found out what is the best timing to start a business instead of taking a risk with blindness (Schumpeter 1934).

In addition, two type of model which listed in Figure 2.2 and Figure 2.3 will use to explain more details to the entrepreneurial attitude which were the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB) (Ajzen & Fishbein, 1980; Ajzen 1985). These two types of model were frequently used by many researchers to do some entrepreneurial researched.

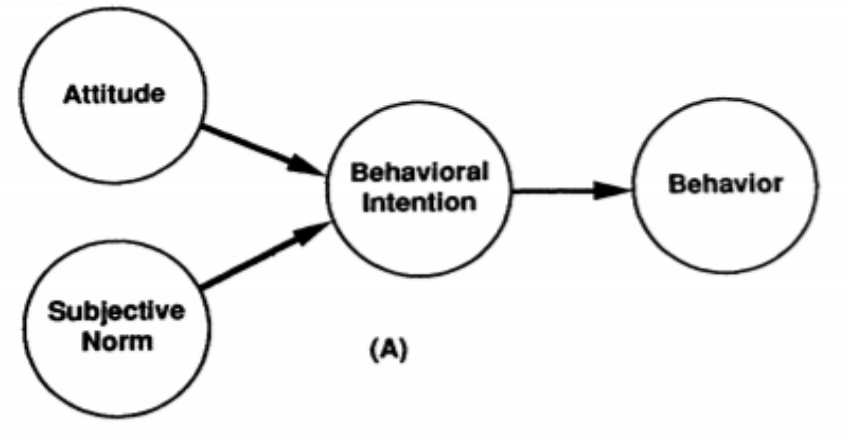


Figure 2.2: Theory of Reasoned Action (TRA)
Source: (Madden, Ellen and Ajzen, 1992)

TRA was a theory which means a person's behavior has decided by his intention to act, and the intention model consisting of two-element that can influence individual behavior, which was the attitude and the subjective norm. While after some years, Ajzen (1985) found out that the people would suffer losses of behavior when insufficient of the resources through the people intent of a good attitude and subjective norm.

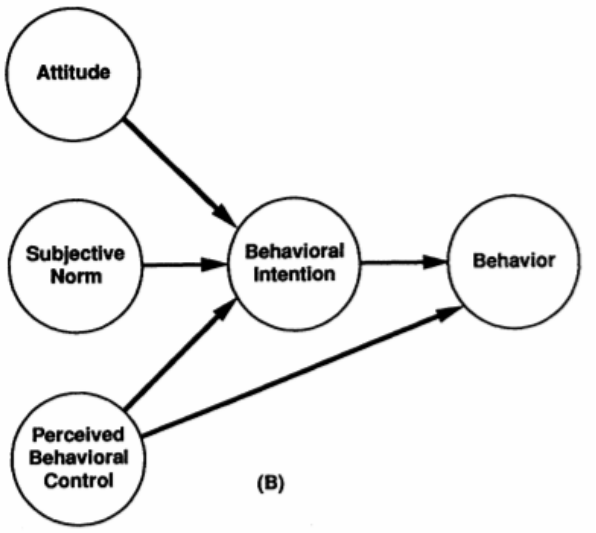


Figure 2.3: Theory of Planned Behavior (TPB)
Source: (Madden, Ellen and Ajzen, 1992)

Thus, the perceived behavioral control had been added to the TRA and became the TPB model in the years of 1985. For comparing these two models,

TPB will be more accurate to predict the behavior intention compared to TRA because TPB was having more variables to predict.

There were many of the researchers using the Ajzen's model and integrated it into the new model to identify the other variables. For example, the researcher - Muofhe and Du Toit (2011), the TPB model had been adapted to the model which consisting the education as the dependent variable to measure the entrepreneur intention. The additional independent variable consists in Figure 2.4 was the attitude towards entrepreneurship, role models, self-efficiency and the external factors.

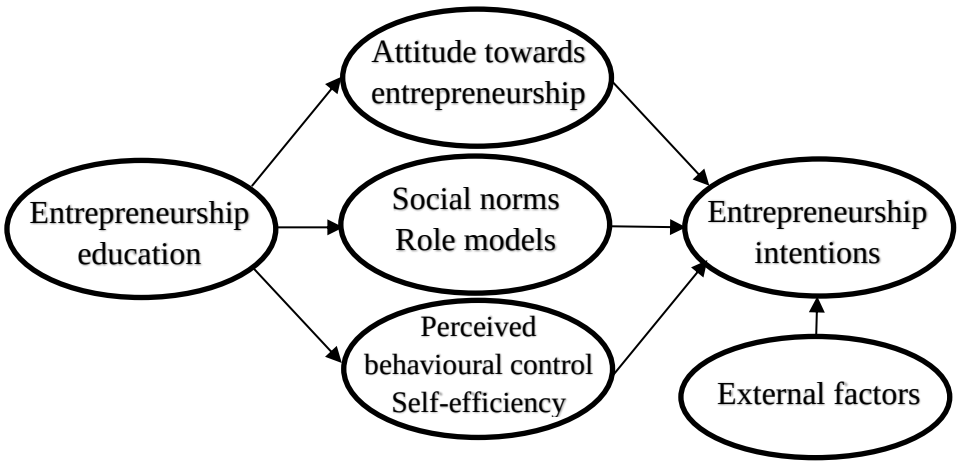


Figure 2.4: Integrative Model for Assessing Entrepreneurial Intentions from Muofhe & Du Toit (2011)

Source: Muofhe & Du Toit (2011)

While Omar, Benachenhou and Arzi adapted the Ajzen's model to form a model which was the attitude towards the entrepreneurial intention (Figure 2.5). This model had got some good results that the motivational factors most influenced the student's attitude toward entrepreneurial intention.

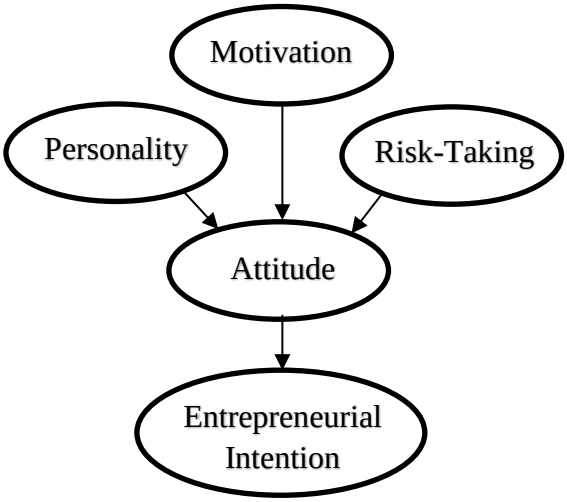


Figure 2.5: Intention-based-model from Omar, Benachenhou and Arzi (2018)
Source: Omar, Benachenhou and Arzi (2018)

Ajzen's model – the TPB has become a useful model that guides the researcher to measure the various type of dependent, and independent variables affect the entrepreneurial intention. Therefore, the personalities factors will be the independent variables that may affect the results of entrepreneurial attitude in this study.

2.8 Independent Variable: Personalities Factors

In the middle of the 20th century, researched the characteristic – Personality of the entrepreneur was began emerged. The researchers investigate the method to define the questioned about the entrepreneur based on the perspectives of economics, psychology, sociology and enterprise management. At first, the inconsistency in the literature brings the researchers to the wrong conclusion that there was no relationship between personality and entrepreneur (Brockhaus & Horwitz, 1986; Gartner, 1988). While during the beginning of the 21st century, the number of people who interested in and able to become an entrepreneur in society was rising slowly. Thus, the research of personalities toward the entrepreneur was continued to proceed in order to improve the consistency of the theoretical framework.

Over the past few decades, researchers have found that the traits of entrepreneurs tend to reside primarily in the Big-5 models, and the further information would be listed in Table 2.5 (Diener & Lucas, 2019). The Big-5

models also included self-efficacy, locus of control, risk-taking, need for achievement etc. There was a lot of research looking at the combination of these traits to analyze entrepreneurship. Based on Ajzen's Theory, the personalities factors are heavily influenced the personal attitude.

Table 2.5: Table of Big-5 Traits

Big 5 Trait	Definition
Openness	The tendency to appreciate new art, ideas, values, feelings and behaviors
Conscientiousness	The tendency to be careful, on-time for appointments, to follow rules and to be hardworking
Extraversion	The tendency to be talkative, sociable and enjoy others
Agreeableness	The tendency to agree and go along with others rather than to assert one's own opinions and choices
Neuroticism	The tendency to frequently experience negative emotions such as anger, worry and sadness as well as being interpersonally sensitive.

Source: Diener, E. & Lucas, R. E. (2019)

However, according to the results from those researchers had shown the various dimension of personalities such as the locus of control, risk-taking and the need for achievement that consisting as a part of the personality and directly influenced the people entrepreneurial attitude (Hasmidyani *et al*., 2019) (Figure 2.6). Despite this, the major factors that influenced the personality have to be identified as the locus of control, need for achievement and risk-taking, which would directly influence the entrepreneurial attitude.

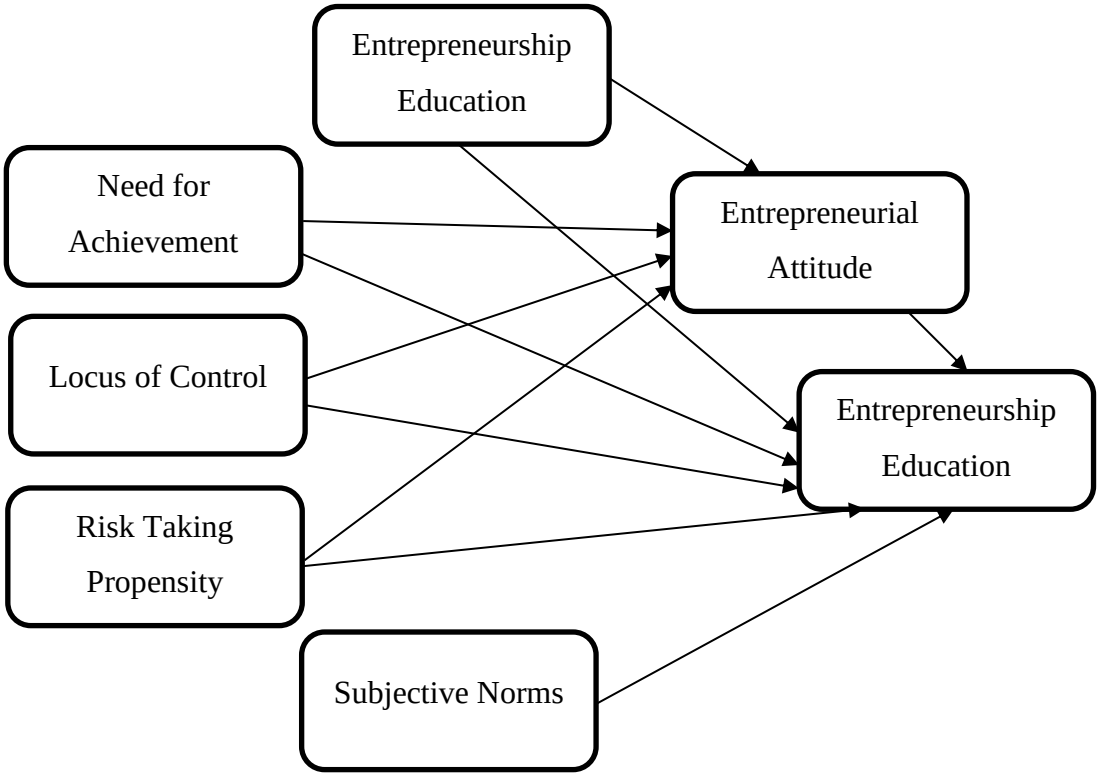


Figure 2.6: Intention-Based Model Through Entrepreneurial Attitude from Hamdani, Suranto and Soetjipto (2018)

Source: Hasmidyani, Suranto, and Soetjipto 2018

2.8.1 Locus of Control

Locus of control as part of the most important trait in the entrepreneurship and it can be defined as external or internal locus of control. People with an internal locus of control would change their lives by controlling their own decision and mindset, while the people with an external locus of control believe that their lives were controlled by the external factors such as fate, destiny and others. Thus, many researchers pointed out that comparing of entrepreneurs and non-entrepreneurs, most of the entrepreneurs required the inherent locus of control and willing to put effort to make life better (Brockhaus, 1982; Gartner, 1985; Shaver and Scott, 1991). For those who do not believe the results of efforts on performance were unlikely to be exposed themselves in a risk situation.

It was worth noting that locus of control was considered a characteristic of cultural dependence. According to Mueller and Thomas (2001), the country with a higher degree of individualism involving of the higher number of citizens with the greater locus of control compared to the country which as the

collectivist cultures. This statement also getting supported by Tajeddini and Mueller (2009). As the evidence, the UK consisting of the larger population of an entrepreneur while compared to Switzerland due to the culture of the country. People who were a success as an entrepreneur was often associated with positive and challenging behavioral processes while the people who do not try to change were quite passive and inefficient in their actions (Robbins, 2005). For an instant, students or employees who were consisting of the internal locus of control can handle quite much of work with effectiveness and well performed. From the analysis of Rauch and Frese (2007), the existing of locus of control had heavily influenced the gaining number of people being successful and became an entrepreneur.

Since all of the information that was showing above had proven that the internal or external locus of control that brings many impacts to the people's attitude toward the entrepreneur. Thus, the research question in this study was formed as below:

Research Question 1:

Is there any relation between Personality Traits (Locus of Control) and the entrepreneurial attitude among engineering students?

2.8.2 Risk-taking

Since from the past, entrepreneurs who were willing to take risks would reach higher goals than the other who afraid to try. Based on the previous investigated (Rees & Shah, 1986; Wagner, 2003; Ekelund et al., 2005), results show that most of the traditional entrepreneurs were required the spirit of risk-taking and those who do not want to take risks were only small portion become entrepreneurs. From this perspective, an attitude that required risk-taking was the main reason why leaders choose paid work or entrepreneurship. From the perspective of psychology, individual risk attitude can be count as one of the personality factors that affecting the decision making to become an entrepreneur (Raunch & Frese, 2000). More significantly, it reveals that different people have different views on any risky decision. So, people with adequate experience, ability or knowledge can make less risky decision (Gifford, 2003).

According to Rosen & Whalen (2002), the conclusion had been made, which was most of the entrepreneurs start businesses not because of willing to take risks but other factors. However, the results of Cramer et al. (2002) support the traditional entrepreneurial mindset, which positive result towards risk-taking attitude, but lack sufficient confidence in the causal relationship between risk aversion and entrepreneurship. For supporting this thesis, Gurol and Atsan (2006) found through a questionnaire that engineering students planning to start a business were more risk-prone than those not inclined to take risks. Similarly, risk tolerance also as a part of risk attitude that significantly affects the number of people or students entering to entrepreneur field (Ahn, 2010). In reality, the business risks and the failure rate make them keep explored and success in self-employed. It makes sense that a person who wants to be an entrepreneur needs to be able to take a lot of risks, and the most important was to move forward.

In conclusion, all of the information obtained from varieties of researchers indicates that the risk attitude is the main rapid and direct feature that affecting people being's an entrepreneur. Thus, the research question in this study was formed as below:

Research Question 2:

Is there any relation between Personality Traits (Risk-Taking) and the entrepreneurial attitude among engineering students?

2.8.3 Need for Achievement

The need for achievement defines as the personal aspire about critical success, excel in abilities and reaching the targets (Sari et al., 2018). There was one assumption made by related researchers, entrepreneurs might own advanced need for achievement because it was challenging to raise one trades which integrate well from personal skills to a system that required spread of obligation during working. Together with the locus of control (LOC), the significant character for the need of achievement need adhesion highly in the literature along with particular aspects.

The sources of need for achievement has come from McClelland (1958) "acquired-needs theory", one of the main requirements influencing personal's

act in a working condition. Initially, this concept was discovered by Murray (1938), after that evolved and vulgarised by McClelland (1961,1985). Most of the researchers observe that higher need for achievement helps in the entry into entrepreneurship. However, this research has a different opinion in relevant contexts. Amongst the issues, Austrian entrepreneurs (Korunka et al., 2003) and the Turkish students (Gürol and Atsan, 2006) agreed with the statement while the study of Swedish entrepreneurship students (Hansemark, 2003) disagreed the assertion. By making comparison within four Austrian studies, Frank et al. (2007) say that to enable an individual to start a business, the need for achievement and other personality factors was far less critical than other factors such as planning, organization and human resources.

Need for achievement principle can be applied to teenagers or students. It can be known as an individual's motivation that drive the students towards a specific goal (Heo *et al.*, 2018). For example, an engineering student set an ambition in mind which want to be a professional engineer in future and this ambition makes him or her concentrate on study and learning. Different types of achievement would bring different influences to the student. Therefore, the need for achievement of personality factor act as crucial parts in entrepreneurial attitude. The achievement that set-in mind would gradually influence the behavior of the students who want to be an entrepreneur than the behavior would follow the entrepreneur behavior and attitude. According to Diver (1982), most of the business was established by engineers who enquired the professional knowledge and technique and called as engineer-entrepreneur.

Indeed, it had shown that the engineering students who required a higher chance to become an entrepreneur. Engineering students were highly educated and acquired specialized knowledge that, over time, affects their personalities, attitudes and behaviors. Thus, the research question in this study was formed as below:

Research Question 3:

Is there any relation between Personality Traits (Need for Achievement) and the entrepreneurial attitude among engineering students?

2.9 Differences between Public and Private Higher Education Institution

Before ending up of forming research questions, some critical information must be listed, and the differences between Public and Private Higher Education Institutions introduced. Although both types of university were very similar, there still exist some differences that lead to different kinds of characteristics associated with students. As Sesen. H (2013) stated environmental factors could influence one's entrepreneurial attitude to start a business. This was because environmental factors were often seen as "gap fillers" in the relationship between personality traits and entrepreneurial attitude (Luthje & Franke, 2003). Environmental factors will be affected one's personality who in the same environment for a long time. This statement was getting supported by several researchers, such as (Luthje & Franke, 2003; Ozen Kutanis et al., 2006; Schwarz et al., 2009). Therefore, it would produce a "Domino Effect" which will influence a person's personality and leads to a different decision in entrepreneurial.

As in Malaysia, Public and Private Universities provide different types of learning, activities and other environments for students. For example, the Public Higher Education Institution were the institution that received subsidized from the government (Wan, 2007). Therefore, the area of Public Universities would be much more significant than most of Private Universities. Therefore, there have a lot of spaces for some curriculum such as sports activities, social club, event performance, and so on. These environments would allow students to attend and build their personality, which indirectly influences the entrepreneurial attitude. Other than that, different types of the university got a different kind of education. Packham et al. (2009) stated that education was the most critical issues that directly affect the student's entrepreneurial attitude. This was because education was the one method that can directly influence a person's mindset and decision.

Indeed, several researchers have described how public and private universities affect student's personality and entrepreneurial attitudes (Luthje &

Franke, 2003; Wan, 2007; Sesen. H, 2013). Therefore, the research question of this study has formed as below:

Research Question 4:

Are there differences between the Personality Traits and Entrepreneurial Attitudes of Engineering Students in Public and Private Higher Education Institutions?

2.10 Hypothesis

H_1: There is a positive significant relationship between personality traits (locus of control) and entrepreneurial attitude.

H_2: There is a positive significant relationship between personality traits (risk-taking) and entrepreneurial attitude.

H_3: There is a positive significant relationship between personality traits (need for achievement) and entrepreneurial attitude.

H_4: There exist differences between the Personality Traits and Entrepreneurial Attitudes of Engineering Students in Public and Private Higher Education Institutions.

2.11 Summary

This chapter had demonstrated a series of issues and how it affects the focusing points in this research. There was further explained the details how the institution brings influences, revolution and change the attitude and behavior among the students enquired the attitude towards the entrepreneur. In this aspect, a variation of views, conducted, arguments and results by the previous researchers had existed. All of the results and opinions were listed clearly and explicit to avoid any misunderstanding of the readers. Everything related to this research had written in literature reviews, and three research questions and three hypotheses had been developed based on the completion of chapter two. For the method that used to conduct and research the results will further be explained in chapter three – methodology of the study.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Introduction

This chapter will discuss more on details of the methodology in this study that used to investigate the personality factors that were affecting the entrepreneurial attitude among engineering's students on public and private universities. The main target population were on engineering students by using a quantitative research method. The distribution of questionnaires has been applied in this study, and at least 300 copies of the questionnaires have to be collected from the target population. Each completed questionnaire can be used to determine whether the person being asked has an entrepreneurial attitude and was suited to be an entrepreneur. Statistical Package for the Social Sciences (SPSS) Statistics software would be used in this study to analyze the overall data in order to investigate the personality factors toward engineering entrepreneurial attitude.

There will be a lot of studies that have to be discussed, such as the conceptual framework, research design, using methods, sampling design and others. After the research method was completed, the researchers will analyze the research results and making a conclusion that supports the hypothesis or was controversial.

3.2 Conceptual Framework

According to Fain (2004), theory as an organized set of an interrelated statement which contains two or above variables that used to comprehend a thing or a problem. While for the concept recognized as a symbolic statement that used to illustrate a phenomenon. Regarding the perception of a few researchers, theory and concept were always interrelated (Green, 2014; Fain 2004; Parahoo, 2006). According to the researcher – Lacey (2010) said that the conceptual frameworks as a phenomenon that indicated the previous researchers' studies and illustrated the concept of the study. Therefore, in order to keep the concept of this study consistent and easy to understand, a conceptual framework of personality factors influences the engineering students' entrepreneurial attitude on public

and private universities has to be formed at below – Figure 3.1. The dependent and independent variables in this study have to be explained within the framework, including Locus of Control, Risk-Taking and Need for Achievement traits which relate to the personality factors.

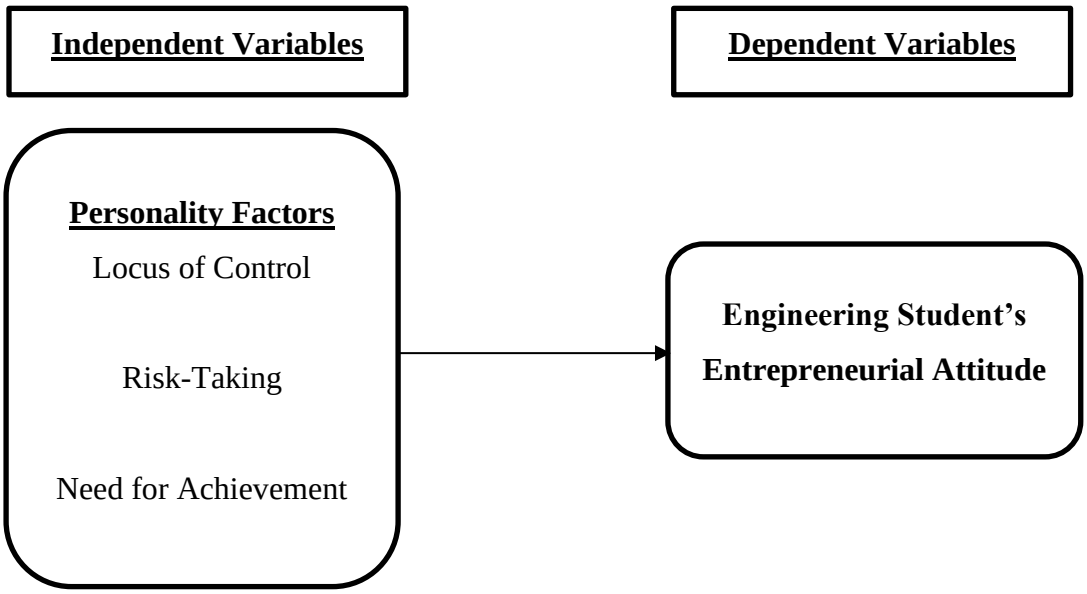


Figure 3.1: Conceptual Framework of Study

3.3 Research Design

The research design was overall planning and procedure for combining and associating different elements of research which include the methods of data collection, data analysis and interpretation (Leedy & Ormrod, 2005; Creswell,2014). According to Vaus (2001), the initial purpose of the design was to ensure that sufficient evidence and information were obtained to achieve the objectives of the study. Therefore, the main objective of this study was targeted to investigate the relationship between personality factors and entrepreneurial attitude among engineering students. There were two types of method exist in research design, that was a quantitative and qualitative method (Blakstad, 2012).

The qualitative research method was used to explore and recognize human behavior, activities and knowledge (Patton, 2005). It involved many kinds of data collection such as interview, observation, document analysis and others (Shuttleworth, 2008). These methods can be used to study and investigate

the social problems and collect data from those targeted population in order to come up with the hypothesis and analyzing the data (Creswell, 2014).

While for the Quantitative research can be defined as the phenomena that relate to the numerical data, mathematical and statistics. It normally uses to investigate and analyzes social or human problems that can be used to predict and explain phenomena with measured numeric and statistics (Creswell, 1994; Gay & Airasian, 2000; Yilmaz, 2013). This research method can be proceeded by using a set of well-designed questionnaires (Sekaran & Bougie, 2016). Those collected data from the distribution questionnaires were analyzed by the computer software, which called Partial Least Squares Based Structural Equation Modeling (PLS-SEM) and Statistical Package for the Social Sciences (SPSS). Hence, this study would apply the quantitative research method and SPSS software on investigates and analyzes the relationship of personality factors and entrepreneurial attitude among engineering students. The differences between qualitative and quantitative analysis were listed in Table 3.1.

Table 3.1: Differences between Qualitative Research and Quantitative Research

Research Aspect	**Qualitative Research**	**Quantitative Research**
Definition	It is a subjective analysis that is more concerned with non-statistical data that cannot be computed.	It is an objective analysis that quantifies data.
Data Types	Typical data include color, gender, nationality, religion and so on.	Typical data include measurable quantities such as length, size, weight, mass and so on.
Research Analysis	Analysis is used to understand why a certain phenomenon occurs.	Analysis is concerned with how many or how much a certain phenomenon occurs.
Samples	Sample is small and is non-representative of the entire population.	Sample is large and can be generalized to cover the entire population.
Purpose	Interprets and understands social interactions.	Test hypotheses and give future predictions.
Research Methodology	Research methodology is exploratory.	Research methodology is often conclusive.

Source: (Lusi.M., 2018)

In order to facilitate understanding of the overall process of the research design, Saunders et al. (2012) have provided a research onion to assist in understanding how the designed works.

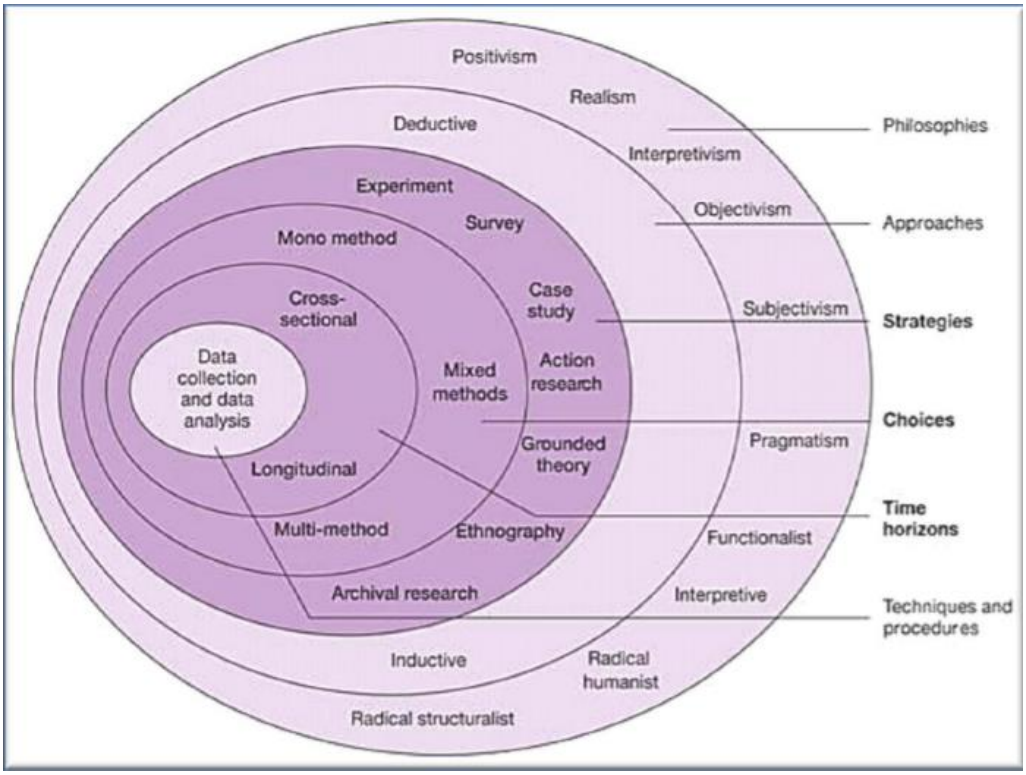


Figure 3.2: The Research Onion

Source: (Saunders, M., Lewis, P. and Thornhill, A.,2012)

This nested model consisted the main three stages for the research design which were the research ideas (First Stage), research methods (Second Stage) and research techniques (Third Stage) (Scott, 2014). The direction flow was from the outer zone to the inner core. The figure above significant showed six layers in the research onion. The first layer at the most outer stand for philosophy; second layer was approached; the third layer was strategies; the fourth layer was choices; the fifth layer was time horizon, and the last layer was techniques and procedures. Every layer consists of choices before proceeding to the next options (Sekaran & Bougie, 2016). In this study, the flow in research onion will be starting from the positivism, deductive, survey, mono method, cross-sectional, data collection and data analysis at the end of the research.

3.4 Data Collection

Data collection plays an important role because it may directly affect the results of research, and any minor errors will lead to inaccurate results. Data collection refers to the method of collecting relevant information, answers and responses from the target population. There was consist of several types of method for data collection, which including interview, questionnaire survey, observation, and so on (Sauders *et al*., 2009; Sekaran & Bougie, 2016).

The primary approach that applies in data collection were distributing the questionnaires, which as the quantitative research method in this study. Three hundred copies of the questionnaire are distributing to the respondent who was the engineering students among public and private universities and collecting all completed questionnaire systematically. The questionnaires were uploaded to google form and distributed to the targeted universities by using social media app and email. The advantages of using this method were to bring convenience to the respondents so that they can fill up the questionnaires everywhere (Sauders *et al*., 2009). Other than that, this method also can economize a lot of time in finding the target respondent. However, there were consisting of two types of data in this study which called primary data and secondary data (Parab, 2013).

3.4.1 Primary Data

Primary data can be called raw data collected from the target respondents as the first-hand data. The primary data can be collected by using survey, observations, experiments and interviews (Mantra, 2016). Besides, primary data also can be known as the data which still not applicable by the other researchers (University of Minnesota, 2015).

3.4.2 Secondary Data

Secondary data were the data obtained from the previous researchers. It also can be obtained from several ways such as journal, internet, magazines, library and thesis of previous researchers (Tran, 2013). The secondary data can be used to support the statement in this study. It also played as the main role to take a review before collecting the primary data (University of Minnesota, 2015).

3.4.3 Target Population

The target population were a set of elements that require information and estimation in research (Canada Ministry of Industry, 2003). The main objective of this study was to focus on investigating the relationship between personality factors and entrepreneurial attitude among engineering students from public and private universities in Malaysia. Hence, there were three public universities, and three private universities were set as the target universities in this study. The three private universities were included Universiti Tunku Abdul Rahman (UTAR), UCSI University and Sunway University whereas the three public universities were targeted in Universiti Malaya (UM), Universiti Putra Malaysia (UPM) and Universiti Sains Malaysia (USM). These Universities were chosen because of their QS rankings. Top 3 of the universities in the private sector and the public had been chosen. Engineering's students were the principal target population in this study and Software Engineering students were not included due to not considered as an engineering course in Malaysia (EAC, 2017). The years of study in engineering courses will not be restricted in the target population. Those target populations were aimed by sending email and google form through the social media app.

3.5 Sampling Design

The sampling design was the process of collecting primary data or first-hand data that related to the title of research through the selecting target population. There were some phases included in sampling design that included determining the population, determine the appropriate framework, analyzing the sampling design, selecting the appropriate sampling process and lastly adopting the selected sampling process (Jayaprakash, 2012). The results were then generalized to the entire population.

3.5.1 Sampling Size

Sampling size was defined as a range of population selected randomly to represent the entire population of the research study (Kadam & Bhalerao, 2010). The reason for this approach was that it was impossible to obtain the entire population when there was a large population. Indeed, the sample sizes must be

carefully selected in order to obtain enough to represent a certain group, rather than the completed number of a certain group obtained by researchers (Krejcie & Morgan, 1970). In order to get accurate data, the regulation of sample sizes was not less 50 in order to achieve data accuracy rather than taking the entire population. This was because the low number of populations would get lesser errors compared to the huge number of populations. The margin of error and confidence level would also affect the accuracy of data (Smith,2013). The margin of errors was the difference between the perception of the respondents and those of the population as a whole. The confidence level is the percentage of the population within the error range (Bland, 2004; Smith, 2013).

Table 3.2: Table for Determining Strength of Association on Sample Size

Samples Sizes	**Strength of Association**
50 < N < 99	Very Poor
100 < N < 199	Poor
200 < N < 299	Fair
300 < N < 499	Good
500 < N < 999	Very Good
N > 1000	Excellent

Sources: (Wilson Van Voorhis, C. R. and Morgan, B. L., 2007)

As Table 3.2 shown, the larger the sample sizes represented the strongest strength of association on each Independent Variable. Therefore, 300 sample sizes were represented well at the strength of association for each type of the Independent Variable. Thus, 300 of sample sizes was taken as the sample sizes of this study.

3.5.2 Sampling Method

Sampling method as the method to draw conclusions on behalf of the whole population after collecting and analyzing sample data from the population in the statistical process (Teddlie & Yu, 2007). In general, sampling method included two types of method that commonly to used which were the probability

sampling and improbability sampling (Teddlie & Yu, 2007; Sauders *et al*., 2009; Nalzaro, 2012). Further information will be shown in Figure 3.3.

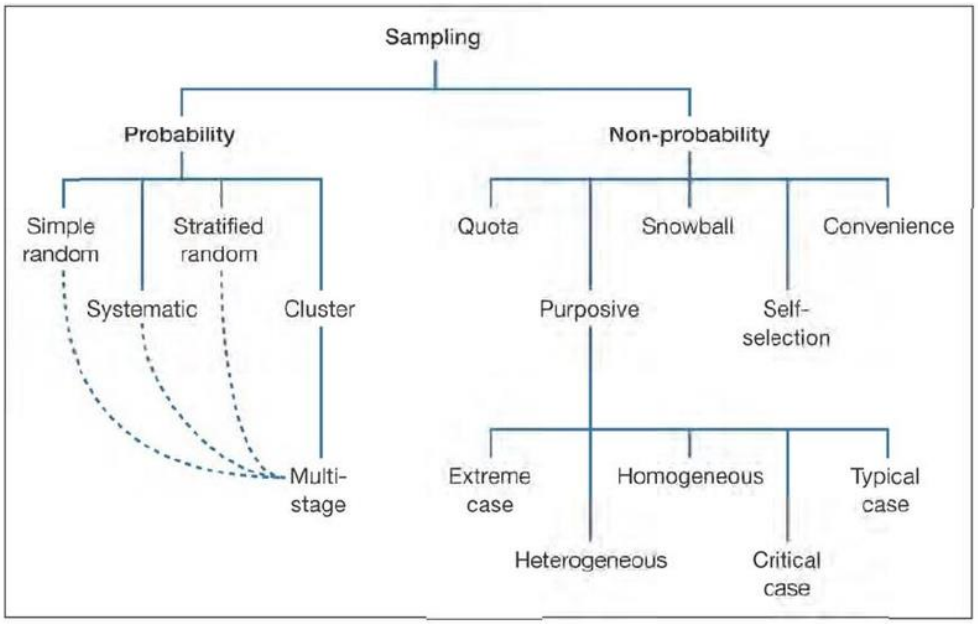


Figure 3.3: Sampling Techniques

Source: (Saunders, *et al*, 2012)

Probability sampling method can be known as the random distribution method. Since it has no specific target, so everyone has a similarity of chances to be the aim of this study (Sauderet al, 2009; Sekaran & Bougie, 2016). As the Figure 3.3 shown at above, there were five types of methods categories as the probability sampling which were the simple random sampling, systematic sampling, stratified random sampling, cluster sampling and the multi-stage sampling.

While for the non-probability sampling method can be defined as the sampling method will be applied to specific population which target of the study. Therefore, only a certain of the population will be involved in the study, and it cannot represent the whole population (Sauders *et al*., 2009; Sekaran & Bougie, 2016). There was consist of the other five categories for the non-probability, which were the quota sampling, purposive sampling, self-selection sampling, snowball sampling and also the convenience sampling.

Hence, the sampling methods that applied in this study were the mix up of the two main sampling method which were the probability and non-probability sampling methods because the study objective was based on the engineering's student among three public universities and three private universities in Malaysia. Therefore, probability sampling method would apply in all of the engineering students so the students would enquire the equal chances to be the target in the study. Whereas the non-probability sampling method was adopted as the research target was engineering students not included the other course of students.

Indeed, for further details of the sampling methods in this study, the simple random sampling, quota sampling and also the purposive sampling methods have to be adopted in this research. The simple random sampling was the simplest form in the sampling techniques and representing the random distribution methods so that each individual would have the same chances to be selected (StatPac, 2010). The quota sampling was to select the representativeness of samples according to the required characteristics. Purposive sampling methods was the method that required the researches to make the selection based on the researchers' knowledge and judgment on a specific population (Latham,2007; Teddlie & Yu, 2007; Sauders, *et al*., 2012).

3.6 Research Instrument

Research instrument can be called as the measuring tools in the research study. It can be used to collect, calculate and analyze the data obtained from the target population (Miller,2015).

3.6.1 Questionnaire Survey

In this study, the questionnaire will be the research instrument in order to obtain the data from the engineering's students in public and private universities. The questionnaire will be used as the research instrument due to low production cost; the completion time was shortened, and the form can be easily filled in everywhere. The questionnaire also can be done as Google form on the internet and its encounter convenience for everyone to complete the form. Hence, the questionnaire will be selected as the research instrument in this study.

3.6.2 Questionnaire Design

In order to reduce the completion time and increase the rate of responses with the questionnaire, the questions stated in the questionnaires have been designed with short, easier to understand and avoid misunderstanding of the questions. The questionnaires consist of three sections that were the demographic profile of the respondent in Section A, the dependent variable of the study in Section B and the independent variable of the study in Section C. The questionnaires in Section C consist of three-part of question-based on different aspects. All of the section has been combined to become a set of questionnaires, and those questionnaires were adapted from previous researchers' study. All of the questions in Section B and C have to be controlled in four to eight questions.

Section A as the collector that collects the target individual' gender, ethnic, year of study, an engineering student and name of the higher education institution. While for Section B was used to investigate the level of an individual's entrepreneurial attitude. The last part, Section C was to investigate the level of personality factors towards entrepreneurial attitude among engineering students.

Table 3.3: Construct of Entrepreneurial Attitude

No.	Original Questions	Modification	Author	Remarks
1.	Being an entrepreneur implies more advantages than disadvantages to me.	Being an entrepreneur implies more advantages to me.	Linan & Chen (2009)	Adapted
2.	A career as entrepreneur is attractive for me.	Starting a business is an attractive idea to me.	Linan & Chen (2009)	Adapted
3.	If I had the opportunity and resources, I'd like to start a firm.	If I had the opportunity and resources, I'd like to become self-employment.	Linan & Chen (2009)	Adapted
4.	Being an entrepreneur would entail great satisfactions for me.	-	Linan & Chen (2009)	Adopted
5.	Among various options, I would rather be an entrepreneur.	-	Linan & Chen (2009)	Adopted

Table 3.4: Construct of Personality Factors (Locus of Control)

No.	Original Questions	Modification	Author	Remarks
1.	It is one's experiences in life which determine what they're like.	My experiences in life is determine by my own actions.	Rotter.J .B. (1966)	Adapted
2.	Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.	It's always better for me to take action rather than to believe in fate.	Rotter.J .B. (1966)	Adapted
3.	In my case getting what I want has little or nothing to do with luck.	My success is depending my hard work, luck has nothing to do with it.	Rotter.J .B. (1966)	Adapted
4.	Getting a good job depends mainly on being in the right place at the right time.	My success depends on being in the right time and the right place.	Rotter.J .B. (1966)	Adapted
5.	When I make plans, I am almost certain that I can make them work.	-	Rotter.J .B. (1966)	Adopted
6.	What happens to me is my own doing.	How your accomplishments depend how you are.	Rotter.J .B. (1966)	Adapted
7.	Sometimes I feel that I don't have enough control over the direction my life is taking.	I feel I can control of my life.	Rotter.J .B. (1966)	Adapted
8.	Becoming a success is a matter of hard work, luck has little or nothing to do with it.	-	Rotter.J .B. (1966)	Adopted

Table 3.5: Construct of Personality Factors (Risk-Taking)

No.	Original Questions	Modification	Author	Remarks
1.	I am not willing to take risks when choosing a work environment.	I am not willing to take risks when starting a new business.	Norton & Moore (2006)	Adapted
2.	I prefer a low risk/ high security work environment with predictable income over a high risk and high reward environment.	I prefer a low risk/ high security in business with predictable profit over a high risk and high profit.	Norton & Moore (2006)	Adapted
3.	I prefer to remain in an environment that has problems that I know about rather than to take the risks of a new environment that has unknown problems, even if the new environment offers greater rewards.	I prefer to remain in a business field that has problems that I know about rather than to take the risks of a new business field that has unknown problems, even if the new business field offers greater rewards	Norton & Moore (2006)	Adapted
4.	I view job-related risk as a situation to be avoided at all costs.	I view business related risk as a situation to be avoided at all costs.	Norton & Moore (2006)	Adapted

Table 3.6: Construct of Personality Factors (Need for Achievement)

No.	Original Questions	Modification	Author	Remarks
1.	I will do very well in fairly difficult tasks relating to my study and my work.	-	Kristiansen & Indarti (2004)	Adopted
2.	I will try hard to improve on past work performance.	-	Kristiansen & Indarti (2004)	Adopted
3.	I will seek added responsibilities in jobs assigned to me.	-	Kristiansen & Indarti (2004)	Adopted
4.	I will try to perform better than my friends.	-	Kristiansen & Indarti (2004)	Adopted

3.6.3 Pilot Test

The pilot test was a test or examination of a questionnaire developed by the researchers to ensure that there were no questions when respondents answer questions (Ismail & Edwards, 2017). Hence, the pilot test must be conducted after the questionnaires survey was completed in order to collect the data with effectiveness and accuracy. The pilot test was limited to at least 30 completed questionnaires. Therefore, 30 copies of questionnaires have to be completed by 30 engineering students in UTAR to run the pilot test by using the SPSS software. The pilot test was carried out by the reliability test in the SPSS software, and the Cronbach's alpha has been determined (Sekaran & Bougie, 2016). The pilot test played an important role in obtaining the final research data with appropriate and accuracy in the study. The value of Cronbach's alpha must get higher than 0.8 in order to achieve a good design and understanding of the questionnaires. The results of the reliability test have shown below Table 3.7.

Table 3.7: Results of Reliability Test Conducted by SPSS

No.	Variables	Number of Items	Number of Respondents	Cronbach's alpha
1.	Entrepreneurial Attitude (DV)	5	30	0.845
2.	Locus of Control (IV1)	8	30	0.809
3.	Risk-Taking (IV2)	4	30	0.807
4.	Need for Achievement (IV3)	4	30	0.848

3.7 Construct Measurement Scale

Stevens (1946) has discovered four types of measurement scales and described the application, characteristics and differences of these different measurement scales. The four types of measurement scale were included nominal scale, ordinal scale, interval scale and ratio scale. According to Pandey & Pandey (2015), these four types of measurement scales were commonly used by researchers. The nominal scale will be applied in Section A, and an ordinal scale was applied in Section B in this research questionnaires.

3.7.1 Nominal Scale

Nominal scale can be known as the labelling variables without any quantitative value (Crossman, 2017). It did not consist of any numerical significance, and the meaning of choice would not overlap each other (Sauders, *et al*., 2009; Sekaran and Bougie, 2016). Therefore, it would be applied in Section A of the questionnaires involving the demographic profile of an individual. For some example, asking an individual' gender (Male or Female), ethnic (Chinese, Malay, Indian), engineering student (Yes or No).

3.7.2 Ordinal Scale

Ordinal Scale has nothing in common with the nominal scale, and it was used to rank problems by order of values (Stevens,1946). Let's list some of the examples that implement the ordinal scale, how satisfied with your job? (Given 1 – Very Unsatisfied, 2 – Unsatisfied, 3 – Neutral, 4 – Satisfied, 5 – Very Satisfied) In generally, 4 was significantly better than 2 and 3. But the meaning

of it still cannot be quantified. For another explanation, the difference between the unsatisfied and neutral same with the very satisfied and satisfied? The answer cannot be determined by people that called ordinal scale. The Likert scale also involving as the part of the ordinal scale. Likert scale was a scale that can measure the level of item from low to high or more to less (Likert, 1932). For example, given a 1 to 10 scale for the car based on the external look. From the perception of Willits, et al., (2016) pointed out that the five-point of Likert scale was enough to classify items and make respondents easy to understand, while the seven-point Likert scale will complicate problems. John (2010) – the researcher has stated that using a five-point Likert scale to conduct results will more accuracy than using below five points or seven points Likert scale. Therefore, the five-point Likert scale has to be applied in Section B in this study and the scale was from "Strongly Disagreed" (SD) to "Strongly Agreed" (SA).

3.8 Data Analysis

All of the data completed by the target respondents were analyzed by using Statistical Package for the Social Sciences (SPSS). There were many types of analyses will be tested in SPSS software such as reliability test, bivariate statistical analysis and multivariate statistical analysis. Before testing each analysis, all completed data must be reviewed, and data not targeted must be filtered to avoid inaccurate results. Data analysis was a process of reasoning, through the way of a questionnaire survey to explain all the data collected (Zikmund, *et al*., 2013).

3.8.1 Descriptive Analysis

Descriptive analysis is an important step during conducts the statistical analysis. It allows researchers to understand how data were distributed, detect outliers, input errors and identify correlations between variables in preparation for further statistical analysis. There was some part consisting of the descriptive analysis, which was the frequency distribution, central tendency, variabilities, and so on. These reason for using these parts of data analysis were to determine the arithmetic average, median, mode, range, standard deviation and variance in this study. After analyzing the data, the table will be used to summarize the data

and form a systematic format. All of the results obtained from the analysis were display by frequency tables and histograms (Zikmund *et al*., 2013).

3.8.2 Reliability Test

Reliability test was an analysis that used to conduct a pilot test by SPSS software. It was based on the raw data collected from the completed questionnaires to do analysis. According to Zikmund *et al.* (2013), reliability testing was a test of the closeness and consistency of the relationships between a group of research items. Cronbach's alpha as an important value that represented the consistency of the items – dependent and independent variables in the researched study (Sekaran & Bougie, 2016). In generally, Cronbach's alpha value must be at least 0.6 to be accepted in the study (Griethuijsen *et al*., 2014). Based on Keith (2017) perception, different Cronbach's alpha values represented by different strength of association in the study (Table 3.8).

Table 3.8: Range of values of Cronbach's alpha

Range of Cronbach's alpha coefficient, α	**Strength of Association**
0.95 – 1.00	Excellent
0.80 – 0.94	Very Good
0.70 – 0.79	Good
0.60 – 0.69	Moderate
0.50 – 0.59	Poor
< 0.50	Unacceptable

Source: (Zikmund, *et al*., 2013)

3.8.3 Normality Test

The normality test defined as a test to ensure the data was well modelled to the normal distribution, providing a basis for the visual test of the distribution normality (Ghasemi & Zahediasl, 2012; Sreejesh *et al*., 2014). There were many types of the frequentist tests consist in the normality test that was D'Agostino's K-Squared test, Jarque -Bera test, Anderson-Darling test, Cramer – von Mises criterion, Kolmogorov – Smirnov test, Lilliefors test, Shapira – Wilk test and Pearson's chi-squared test. There were two types of the test involved in the

normality test, that were the parametric test and non-parametric test (Schindler & Sun, 2006). For the parametric test, it was based on ratio and interval data to analyze the output while the non-parametric test was based on the ordinal and nominal data type.

3.8.4 Multicollinearity

Multicollinearity was a state in which independent variables were highly correlated or independent. Hence, it was a type of interference in the data, and if such interference exists in the data, statistical inferences about the data may be unreliable (O'brien, 2007). This reason for conduct this analysis was used to predict and tested the relationship between the independent variables in this study. For testing the multicollinearity between each of the independent's variables, there were two types of the coefficient that used to determine the multicollinearity, which was the Tolerance and Variance Inflation Factor (VIF). As the information showing below Table 3.9, when the tolerance value was greater than 0.1, there was no multicollinearity. When VIF value was greater than 10, multicollinearity exists.

Table 3.9: Indication of Variance Inflation Factor (VIF)

Variance Inflation Factor (VIF)	Indication
$1 < VIF < 10$	No multicollinearity issues
$VIF \geq 10$	Serious multicollinearity issue
$VIF = \infty$ (undefined)	Perfect multicollinearity issue

Source: (O'brien, 2007)

As the information showing in Table 3.9, the value of VIF in between the range of 1 to 10 was the most perfect. Therefore, the VIF in this study must be between the factors 1 to 10.

3.9 Inferential Analysis

Inferential Analysis was a type of analysis that used to test and check the relationship between the dependent variable and independent variables (Marshall & Jonker, 2011). Inferential Analysis was the analysis that takes a

part of the sample from a specific population to describe and infer the entire population. Therefore, there must be some errors in the data so that the accuracy of the data would not reach 100% correct (Klazema, 2014).

3.9.1 Pearson's Correlation Analysis

Pearson's Correlation Analysis was an analysis that used to measure the statistical relationship or strength of association between two types of variables based on the method of covariance. It provides information about the strength of the association or correlation and the direction of the relationship (Sekaran & Bougie, 2016). The value that using to test the correlation between the variables were the Person's Correlation coefficient – r. The indicator for r will be in the range of -1.0 to +1.0. If the value of r was obtained as 0 value, that's meant there will not be existing any relationship between the variables. If the results show the positive value, meanings that there was existing a positive correlated and also can be said as a positive linear relationship (Hair, 2016). For further information about the range of Person's Correlation coefficient will be listed in Table 3.10.

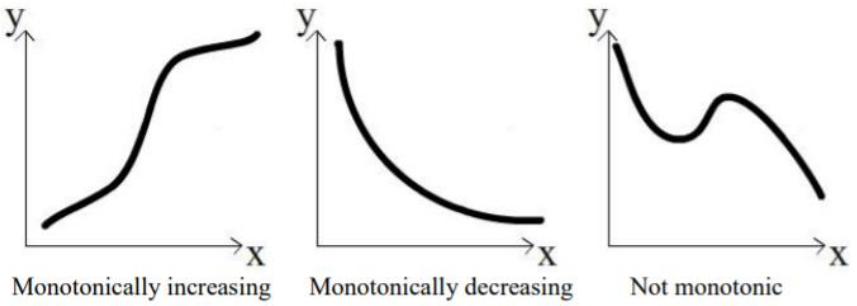
Table 3.10: Rules of Thumb about Correlation Coefficient Size

Range of Pearson's Coefficient	Strength of Association
± (0.91 to 1.00)	Very Strong
± (0.71 to 0.90)	High
± (0.41 to 0.70)	Moderate
± (0.21 to 0.40)	Small but definite relationship
± (0.00 to 0.20)	Slight, almost negligible

Source: (Hair, 2016)

3.9.2 Spearman's Rho Correlation Analysis

Spearman's Rho Correlation Analysis defined as a non-parametric analysis that used to evaluated and measured the monotonic relationship between ordinal or nominal data. The monotonic function was a function that neither increases nor decreases as the independent variable increases. The further explanation of the monotonic function will be listed in Figure 3.4.



- Monotonically increasing - as the x variable increases the y variable never decreases;
- Monotonically decreasing - as the x variable increases the y variable never increases;
- Not monotonic - as the x variable increases the y variable sometimes decreases and sometimes increases.

Figure 3.4: Explanation of Monotonic Functions

Source: (Weir, 2015)

Spearman's Correlation coefficient was quite similar to Pearson's Correlation coefficient. Its indicator by symbol rs while Pearson's coefficient was r. For the meaning represented by rs also similar to the Person's which meant the range of rs would between -1.0 to +1.0. The only difference was the Spearman Correlation coefficient was an indicator of the strength of the monotonic relationship. The strength of Spearman's correlation will be listed below Table 3.11.

Table 3.11: Rule of thumb about Spearman's Rank Coefficient sizes

Range of Spearman's Rank Coefficient	**Strength of Association**
0.80 to 1.0	Very strong
0.60 to < 0.80	Strong
0.40 to < 0.60	Moderate
0.20 to < 0.40	Weak
<0.20	Very weak

Source: (Weir, 2015)

3.10 Regression Analysis

Regression Analysis was an analysis that used to model the relationship between the independent variable and the dependent variable (Cooper *et al*., 2006). It was included two types of regression which were the simple linear regression and multiple linear regression.

3.10.1 Simple Linear Regression

According to Altman & Krzywinski (2015), simple linear regression defined as a method to test the relationship between the dependent and independent variable. This type of regression will more be looked for statistical relationships but not deterministic relationships. If one of the variables can be represented as an accuracy to the other variable, then the relationship between both variables can be said as deterministic (Swaminathan, 2018). For example, using Celsius represented as the predict of Fahrenheit. Both of them could get the same results by accuracy. While for the statistical relationship will not so accurate as of the deterministic relationship. For example, the relationship between age and height.

3.10.2 Multiple Linear Regression

Multiple Linear Regression was another form of linear regression analysis. It was quite similar to the simple linear regression which was used to predict the statistical relationship between the dependent and independent variable. The only difference was the multiple linear regression will in charge more of the independent variable (Sekaran & Bougie, 2013). According to Sauders *et al*., (2009), there consist of one analysis model that used to compute the multiple linear regression as below eq 3.1 and eq 3.2:

$$Y = \alpha+\beta1X1+\beta2X2+\beta3X3 \quad (3.1)$$

Where

X = Independent Variables

Y = Dependent Variable

α = Regression Constant

β = Beta Coefficients

$$DV= \alpha+(\beta1\times IV1) + (\beta2\times IV2) + (\beta3\times IV3) \quad (3.2)$$

Where

DV = Dependent Variables

IV = Independent Variables

Therefore, the dependent variable in this study was entrepreneurial attitude while for the three independent variables were the locus of control, risk-taking and need for achievement. The relationship between the dependent and independent variable will be conducted as a result of using equation 3.2.

3.11 Summary

This chapter has mainly discussed the overview of the research methodology in this study. The using method and the detail for the sampling were clarified in this chapter. The target universities and the population were discussed and explained in details. There were many types of analysis used in this chapter which included the pilot test, reliability test, normality test, multicollinearity test, inferential analysis, Pearson and Spearman's correlation analysis and also the regression analysis. The further detailed of the results will discuss in the following chapter.

CHAPTER 4

RESULTS AND ANALYSIS

4.1 Introduction

This chapter will mainly study the survey results which are obtained from the questionnaires from different Universities. As outlined in previous reports, a total of 300 questionnaires have been distributed to each university and have been completed. The results obtained from the questionnaires are composed of measurement scales, which are used to proceed with the descriptive analyses and inferential analyses. Throughout the distribution of questionnaires, it has been fill completed by 317 respondents and collected successfully. Hence, a total of 317 copies of data are used to analyses and interpreted by the Statistical Package for the Social Sciences (SPSS) Statistics software as an analytical tool in this research in order to obtain the statistical table or results as evidence that used to support this research studies.

The sampling design in this study is combined of three sampling method to distributed questionnaires which are simple random method from probability sampling, purposive and quota sampling method from non-probability sampling. The questionnaires are based on these three-sampling methods and distributed through social media such as E-mail, Facebook, WhatsApp, WeChat and Google Form.

Before proceeding to the distribution phase, the Pilot test plays the main role in results analysis session. This is a test to check the questionnaire developed by the researchers and to ensure that the respondents have no questions when answering the questions. The pilot test had been conducted before entering the distribution phase, and its total of 30 copies had completed among engineering students in UTAR. According to Sekaran and Bougie (2016), the value of Cronbach's alpha must get higher than 0.8 in order to achieve a good design and reliable. Live up to expectation, the Cronbach's alpha obtained in this study have met the requirement which is Entrepreneurial Attitude (DV) – 0.845; Locus of Control (IV1) – 0.809; Risk-Taking (IV2) – 0.807 and Need for Achievement (IV3) – 0.848.

Descriptive analysis will be illustrated by corresponding charts and statistical table accordingly. The output from the Statistical Package for the Social Sciences (SPSS) Statistics software will be interpreted in tables developed for scale measurement and inferential analysis. The total sample of data collected from each of the university has been stated in Table 4.1.

Table 4.1: Total sample number of respondents used in research

Higher Education Institutions	Total Number of Respondents	Total Usable Number of Respondents	Total Unusable Number of Respondents
UTAR	56	52	4
UCSI	51	51	-
SUNWAY	55	52	3
UM	54	53	1
UPM	50	50	-
USM	51	51	-
Total	317	309	8

Table 4.1 shows the total number of data collected from each of the private and non-private university. The responses to the questionnaires are quite good, which obtained 317 copies of completed questionnaires. However, among these 317 copies of questionnaires, there are around eight copies of questionnaires unusable in this study due to non-engineering course reason. Hence, the final usable of data to do analysis in this study is approximately 309 students. Among these 309 students, there are 52 from Universiti Tunku Abdul Rahman (UTAR); 51 from UCSI; 52 from University SUNWAY; 53 from Universiti Malaya (UM); 50 from Universiti Putra Malaysia and 51 from Universiti Sains Malaysia (USM).

4.2 Descriptive Analysis

The descriptive analysis helps to summarize the characteristics of the collected data sets. Through a brief descriptive analysis, and overall demographic profile

of the respondents is obtained, which including gender, ethnic, year of study, engineering or non-engineering student and higher education institutions.

4.2.1 Demographic Profile of Respondents: Gender

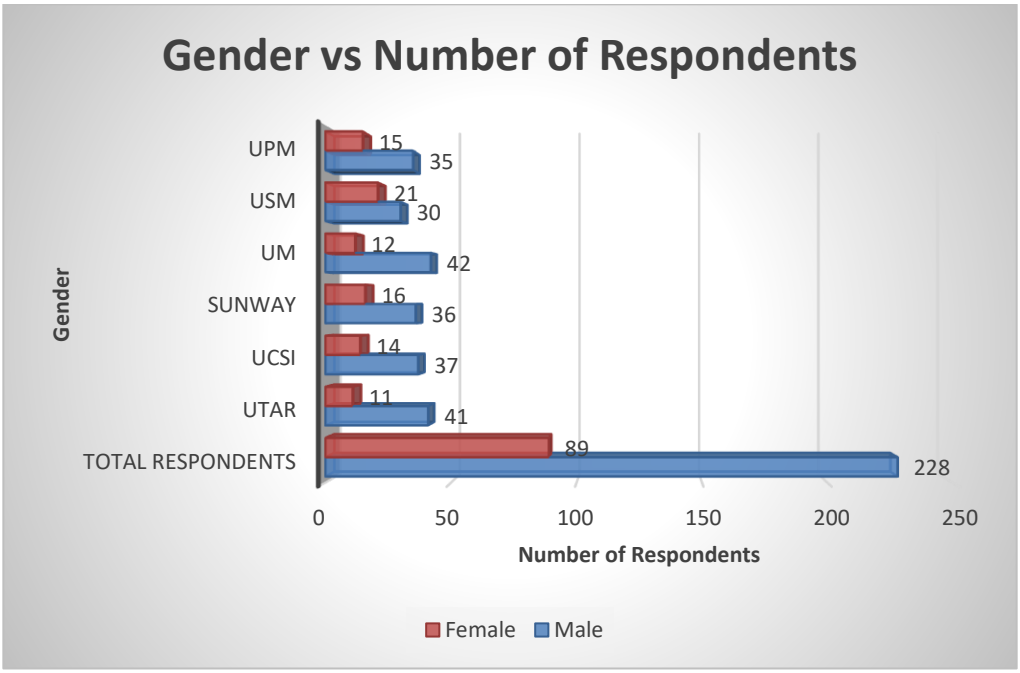


Figure 4.1: Gender of Respondents

As can be seen from Figure 4.1, it shows that the numbers of the respondents in different genders from each of the higher education institution. Out of 317 respondents, 89 respondents are female, and the rest of the 228 respondents are male. As Figure 4.1, its significant shows that the number of male's respondents among engineering students are roughly higher than the female respondents.

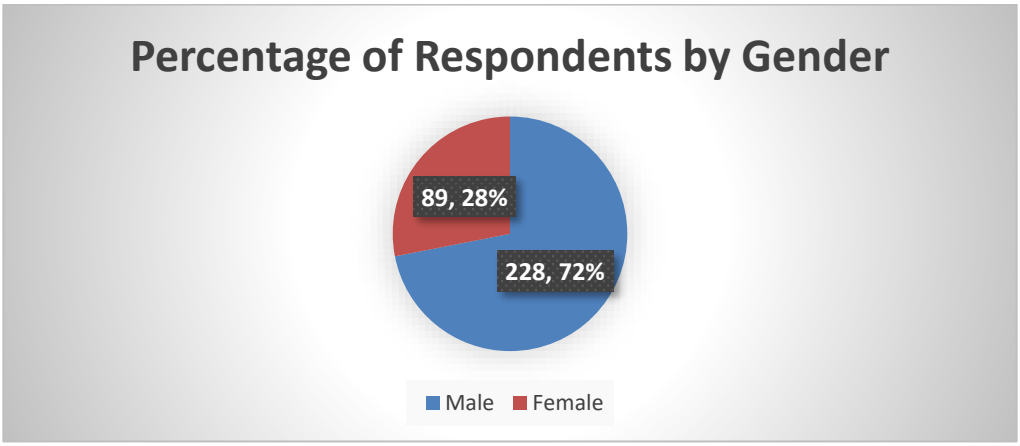


Figure 4.2: Percentage of Respondents by Gender

As the total number of 317 respondents, the female has occupied around 28% and the male has occupied the rest of 72% in total respondents which shows in Figure 4.2.

4.2.2 Demographic Profile of Respondents: Ethnic Group

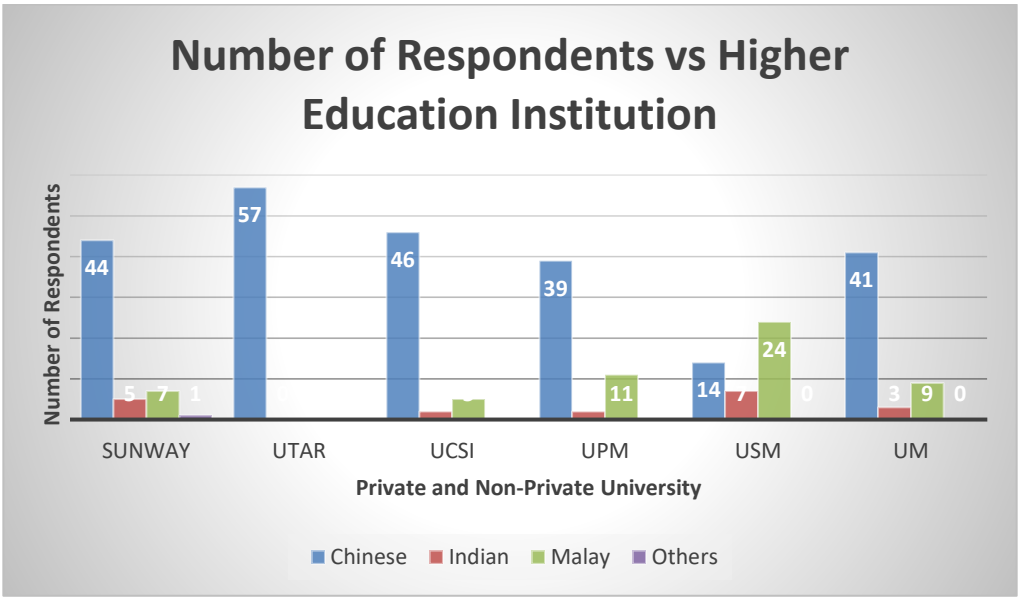


Figure 4.3: Number of Respondents from each of the Ethnic Group in Private and Non-Private University

Figure 4.3 shows the number of respondents from each of the ethnic group located in various university. Based on the results that obtained from the completed questionnaires, it is obviously showing that most of the respondents are Chinese ethnic which as the major respondents in each of the higher education institution except the Universiti Sains Malaysia (USM) respondents are from Malay ethnic. Therefore, the most major percentage of the respondent is from Chinese ethnic then follow by the Malay ethnic, Indian and the other ethnic.

4.2.3 Demographic Profile of Respondents: Year of Study

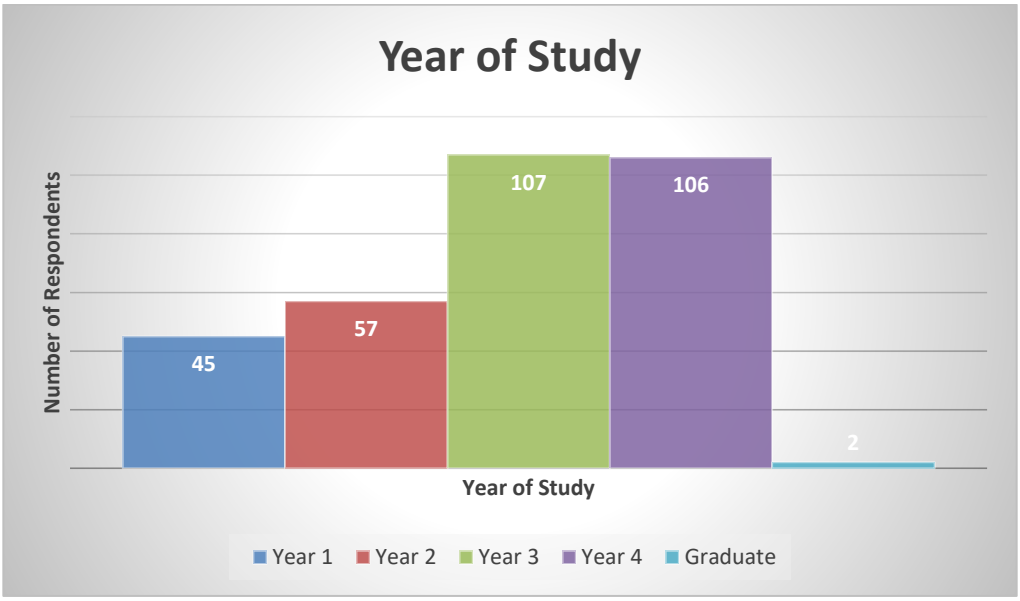


Figure 4.4: Year of Study

Based on Figure 4.4 indicates that there listed by five different years of study. Through the total of 317 copies of results, it shows that the most major respondents are from year three and year four students who are 107 (33.75%) and 106 students (33.12%). Hence, follow by the year 2 students (n=57, 17.98%) and year 1 students (n=45, 14.2%). The lowest number of respondents are only 2 (0.63%), which the students are already graduated from university.

4.2.4 Demographic Profile of Respondents: Engineering Students

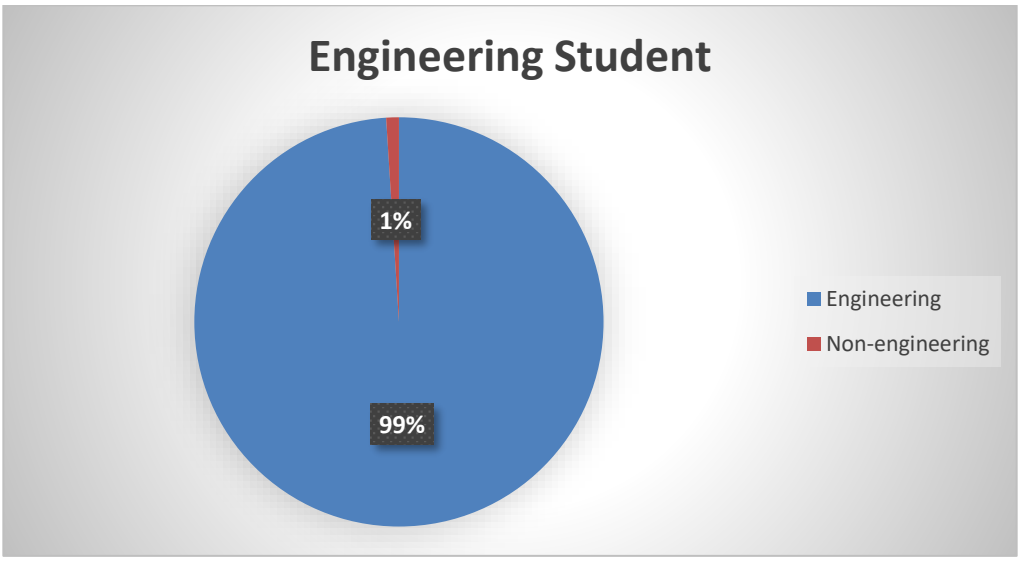


Figure 4.5: Engineering Student

Figure 4.5 shows that only 1% (n=8) of the respondent from non-engineering courses are insisted in this survey study and completed the questionnaires. While the rest 99% (n=309) out of the total are engineering courses from the various higher education institution. Hence, the data collected was quite looking's good due to this study are focusing on engineering students.

4.2.5 Demographic Profile of Respondents: Higher Education Institution

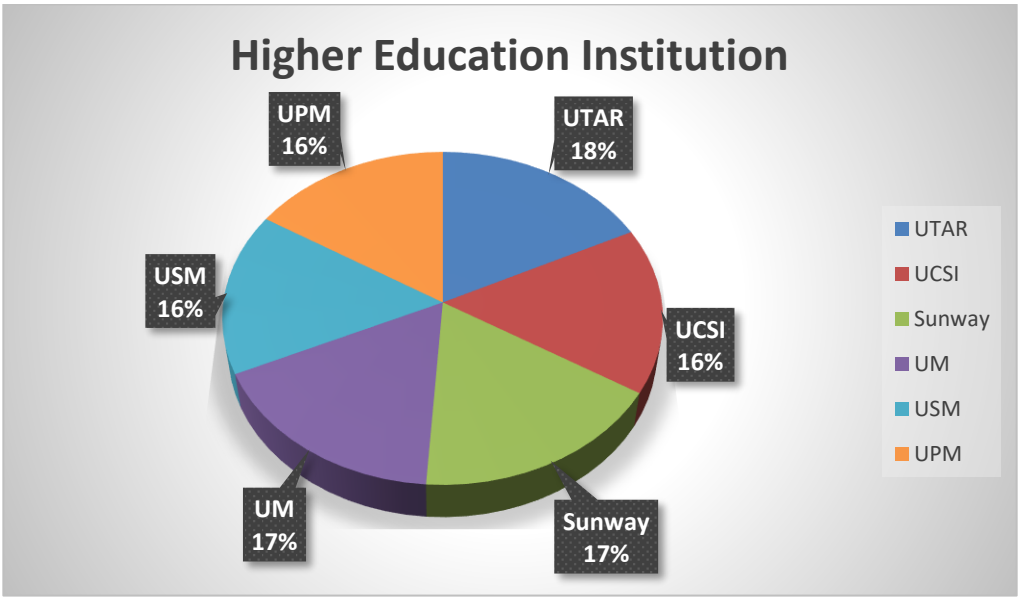


Figure 4.6:Percentage of Respondents on each of Higher Education Institution

Based on Figure 4.5 had shown that the percentage of each higher education institution is quite average, which around 16% to 18%. For private higher education, there are a number of 56 respondents from UTAR; 51 respondents from UCSI and 55 respondents from Sunway University. While for the non-private higher education are consist of UM, UPM and USM, which obtained the number of respondents is 54,50 and 51.

4.2.6 Summary of Demographic Profile of Respondents

Table 4.2: Summary of Demographic Profile of Respondents

	Respondent	Cumulative Respondents	%	Cumulative %
Gender				
Male	228	228	72	72
Female	89	317	28	100
Ethnic				
Chinese	241	241	76.02	76.02
Malay	56	297	17.67	93.69
Indian	19	316	5.99	99.68
Others	1	317	0.32	100
Year of Study				
Year 1	45	45	14.20	14.20
Year 2	57	102	18.00	32.20
Year 3	107	209	33.75	65.95
Year 4	106	315	33.44	99.39
Graduated	2	317	0.61	100
Engineering Student				
Engineering	309	309	99	99
Non-engineering	8	317	1	100
Higher Education Institution				
UTAR	56	56	18	18
UCSI	51	107	16	34
Sunway	55	162	17	51
UM	54	216	17	68
USM	51	267	16	84
UPM	50	317	16	100

Table 4.2 shows the demographic profiles of all respondents. The gender, ethnic, year of study, an engineering student and higher education institution are obtained through questionnaires from a total of 317 copies of usable respondents.

4.2.7 Descriptive Analysis: Dependent Variables (Entrepreneurial Attitude)

Entrepreneurial Attitude will be the only one dependent variable in this research study. Therefore, all of the data completed by the respondents for each statement will be developed as visualized graphs and chart in order to view the results easily.

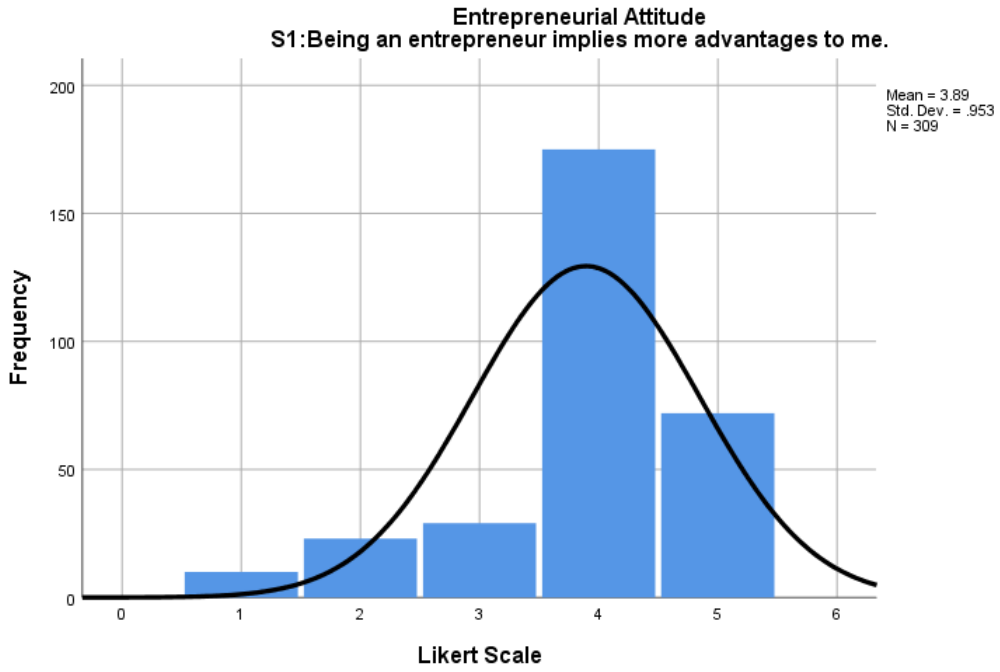


Figure 4.7: Entrepreneurial Attitude – Being an entrepreneur implies more advantages to me.

Figure 4.7 shows that most of the students are agreed to the statement of "Being an entrepreneur implies more advantages to me", which obtained the total number of 175 students. Hence, the strongly agree option be the second highest in this statement which getting a total of 72 copies selected. Follow by 29 neutral to this statement, 23 disagree and the least of the students – 10 to strongly disagreed.

Table 4.3: Frequency for “Being an entrepreneur implies more advantages to me.”

Entrepreneurial Attitude (S1)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	10	3.2	3.2	3.2
	2	23	7.4	7.4	10.7
	3	29	9.4	9.4	20.1
	4	175	56.6	56.6	76.7
	5	72	23.3	23.3	100.0
	Total	309	100.0	100.0	

Table 4.3 shows the results from the statement "Being an entrepreneur implies more advantages to me." From the table 4.3 was significant shows that the total percentage of respondents toward disagree occupied 10.7% while for the percentage of respondents toward agree are total 79.9% which already cover almost four over 5 in total number. Therefore, it can conclude that the respondents are more towards agree to this statement.

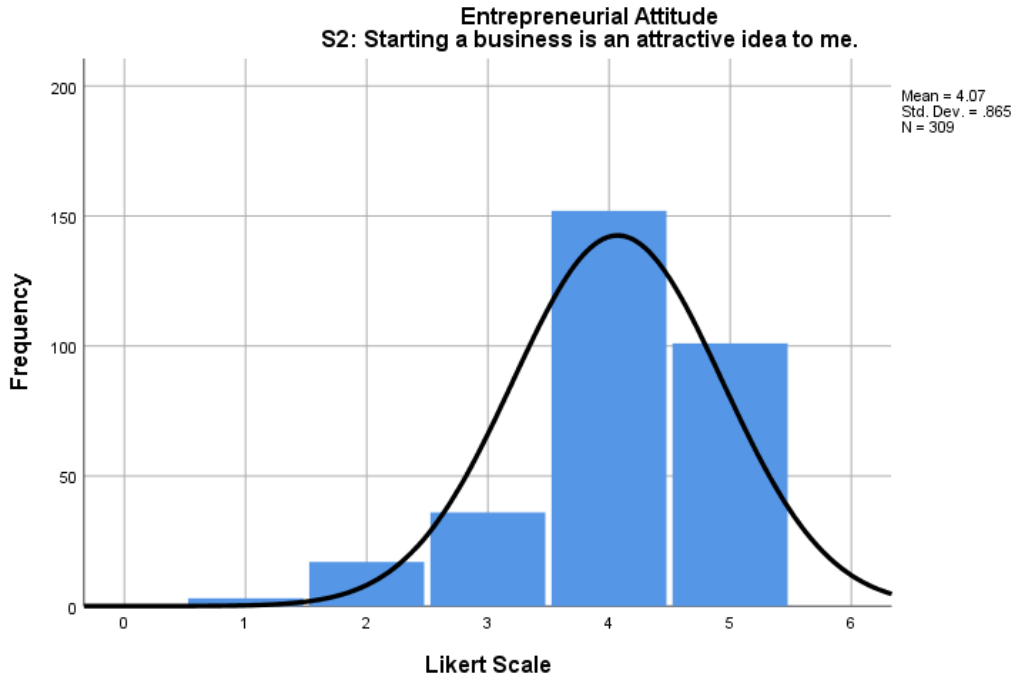


Figure 4.8: Entrepreneurial Attitude – Starting a business is an attractive idea to me.

Figure 4.8 shows that the highest number of students which obtained 154 agrees to the statement – "Starting a business is an attractive idea to me". After that, the strongly agree to this statement are occupied the total number of 103 students which located the second-highest score in this statement, followed by 37 number of students maintain neutral, 18 disagree and the least of the student, four students strongly disagree.

Table 4.4: Frequency for “Starting a business is an attractive idea to me.”

Entrepreneurial Attitude (S2)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	3	1.0	1.0	1.0
	2	17	5.5	5.5	6.5
	3	36	11.7	11.7	18.1
	4	152	49.2	49.2	67.3
	5	101	32.7	32.7	100.0
	Total	309	100.0	100.0	

Table 4.4 shows the results from the statement "Starting a business is an attractive idea to me." From the table 4.4 was significant shows that the total percentage of respondents toward disagreeing occupied 6.94% while for the percentage of respondents toward agreeing are total 81.39% which already cover more than four over 5 in total number. Therefore, it can conclude that the respondents are more towards agree to this statement.

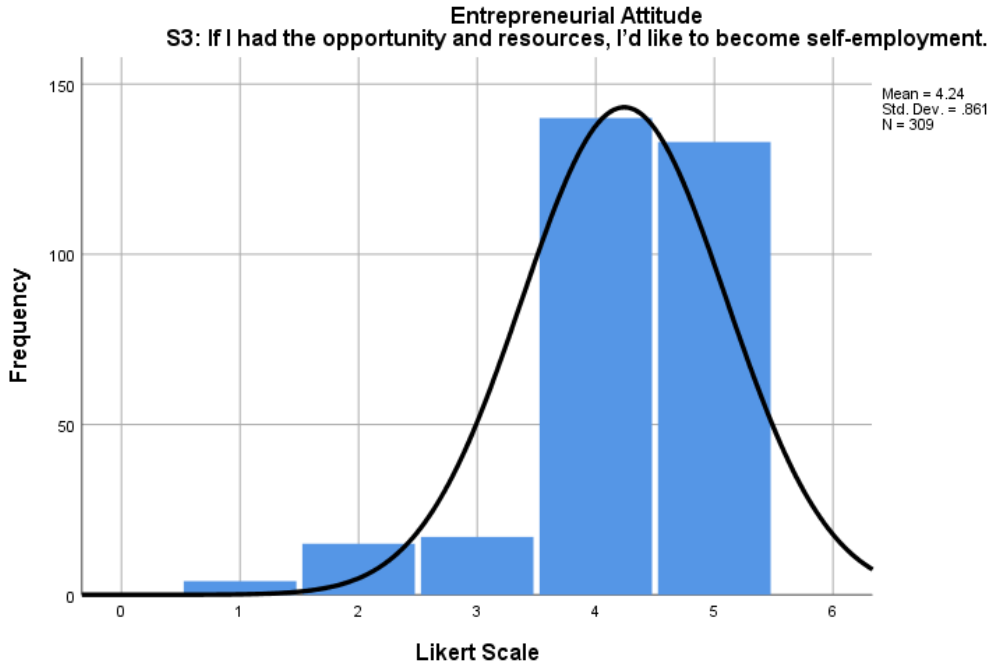


Figure 4.9: Entrepreneurial Attitude – If I had the opportunity and resources, I'd like to become self-employment.

Figure 4.9 shows that the highest number of students which obtained 140 agrees to the statement – "If I had the opportunity and resources, I'd like to become self-employment". After that, the strongly agree to this statement are occupied the total number of 133 students which located the second-highest score in this statement, followed by 17 number of students maintain neutral, 15 disagree and the least of the student, four students strongly disagree.

Table 4.5: Frequency for "If I had the opportunity and resources, I'd like to become self-employment."

Entrepreneurial Attitude (S3)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	1.3	1.3	1.3
	2	15	4.9	4.9	6.1
	3	17	5.5	5.5	11.7
	4	140	45.3	45.3	57.0
	5	133	43.0	43.0	100.0
	Total	309	100.0	100.0	

Table 4.5 shows the results from the statement "If I had the opportunity and resources, I'd like to become self-employment." From the table 4.5 was significant shows that the total percentage of respondents toward disagreeing occupied 6.1% while for the percentage of respondents toward agreeing are total 88.3% which already cover more than four over 5 in total number. Therefore, it can conclude that the respondents are more towards agree to this statement.

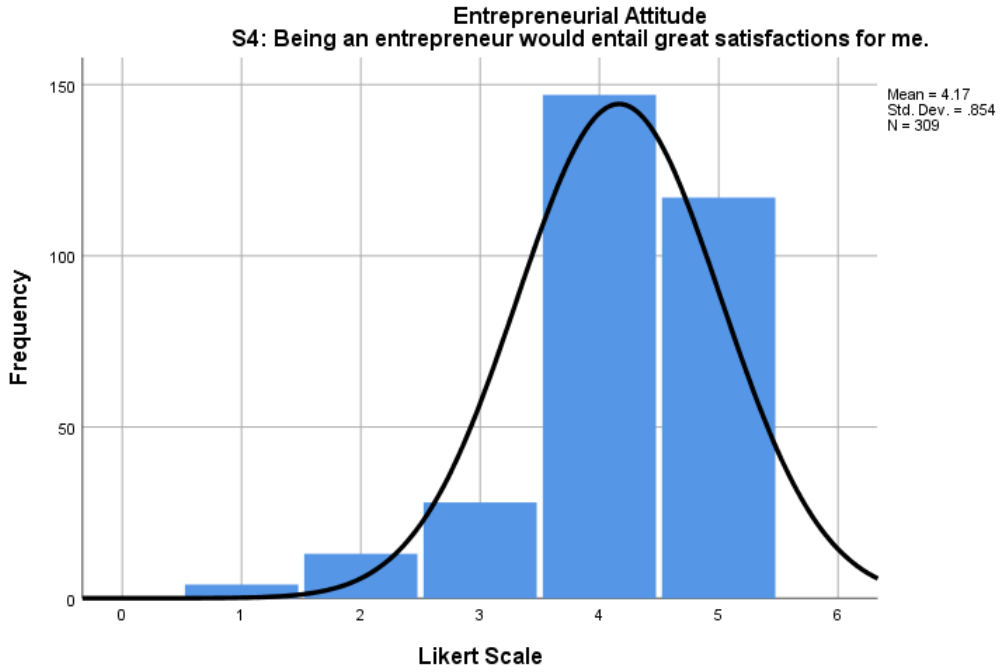


Figure 4.10: Entrepreneurial Attitude – Being an entrepreneur would entail great satisfactions for me.

Figure 4.10 shows that the highest number of students which obtained 147 agrees to the statement – "If I had the opportunity and resources, I'd like to become self-employment". After that, the strongly agree to this statement are occupied the total number of 117 students which located the second-highest score in this statement, followed by 28 number of students maintain neutral, 13 disagree and the least of the student, four students strongly disagree.

Table 4.6: Frequency for “Being an entrepreneur would entail great satisfactions for me.”

Entrepreneurial Attitude (S4)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	1.3	1.3	1.3
	2	13	4.2	4.2	5.5
	3	28	9.1	9.1	14.6
	4	147	47.6	47.6	62.1
	5	117	37.9	37.9	100.0
	Total	309	100.0	100.0	

Table 4.6 shows the results from the statement "Being an entrepreneur would entail great satisfaction for me." From the table 4.6 was significant shows that the total percentage of respondents toward disagreeing occupied 5.5% while for the percentage of respondents toward agreeing are total 85.5% which already cover more than four over 5 in total number. Therefore, it can conclude that the respondents are more towards agree to this statement.

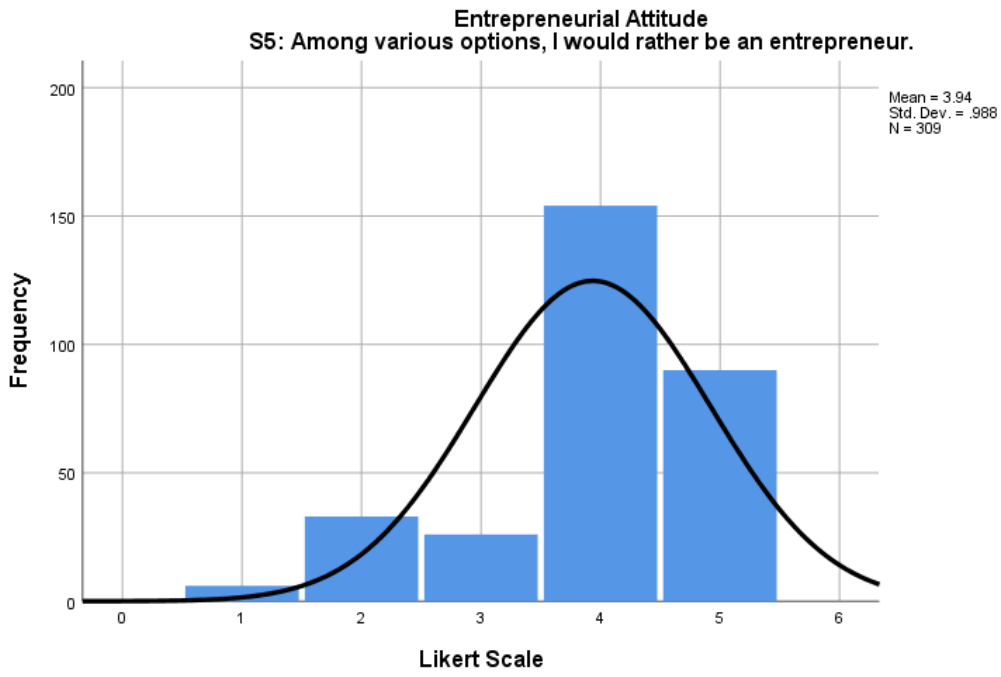


Figure 4.11: Entrepreneurial Attitude – Among various options, I would rather be an entrepreneur.

Figure 4.11 shows that the highest number of students which obtained 154 agrees to the statement – "If I had the opportunity and resources, I'd like to become self-employment". After that, the strongly agree to this statement are occupied the total number of 90 students which located the second-highest score in this statement, followed by 26 number of students maintain neutral, 33 disagree and the least of the student, six students strongly disagree.

Table 4.7: Frequency for "Among various options, I would rather be an entrepreneur."

Entrepreneurial Attitude (S5)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	6	1.9	1.9	1.9
	2	33	10.7	10.7	12.6
	3	26	8.4	8.4	21.0
	4	154	49.8	49.8	70.9
	5	90	29.1	29.1	100.0
	Total	309	100.0	100.0	

Table 4.7 shows the results from the statement "Among various options, I would rather be an entrepreneur." From the table 4.7 was significant shows that the total percentage of respondents toward disagreeing occupied 12.6% while for the percentage of respondents toward agree are total 78.9% which almost cover four over 5 in total number. Therefore, it can conclude that the respondents are more towards agree to this statement.

4.2.8 Descriptive Analysis: Independent Variables (Personality Factors)

Personality Factors will be the independent variable in this research study which including locus of control, risk-taking and also the need for achievement. Therefore, all of the data completed by the respondents for each statement will be developed as visualized graphs and chart in order to view the results easily.

4.2.8.1 Descriptive Analysis: Locus of Control Traits

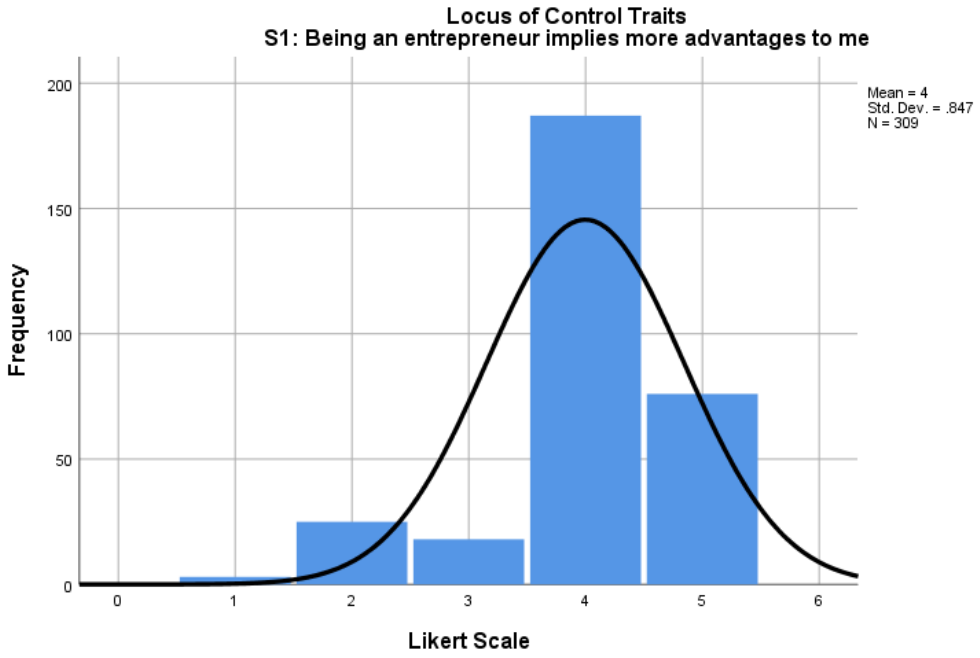


Figure 4.12: Locus of Control – My experiences in life is determine by my own actions.

Figure 4.12 shows that the highest number of students which obtained 187 agrees to the statement – "My experiences in life is determine by my own actions". After that, the strongly agree to this statement are occupied the total number of 76 students which located the second-highest score in this statement, followed by 25 number of students disagree, 18 students maintain neutral and the least of the student, three students strongly disagree.

Table 4.8: Frequency for "My experiences in life is determine by my own actions."

Locus of Control Traits (S1)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	3	1.0	1.0	1.0
	2	25	8.1	8.1	9.1
	3	18	5.8	5.8	14.9
	4	187	60.5	60.5	75.4
	5	76	24.6	24.6	100.0
	Total	309	100.0	100.0	

Table 4.8 shows that the number of frequencies for "My experiences in life is determined by my own actions." The total results toward disagree are around 9.1% overall. While for the percentage of respondents toward agree are total 85.1%, which almost cover four over 5 in total number. Therefore, it can conclude that the respondents are more towards agree to this statement.

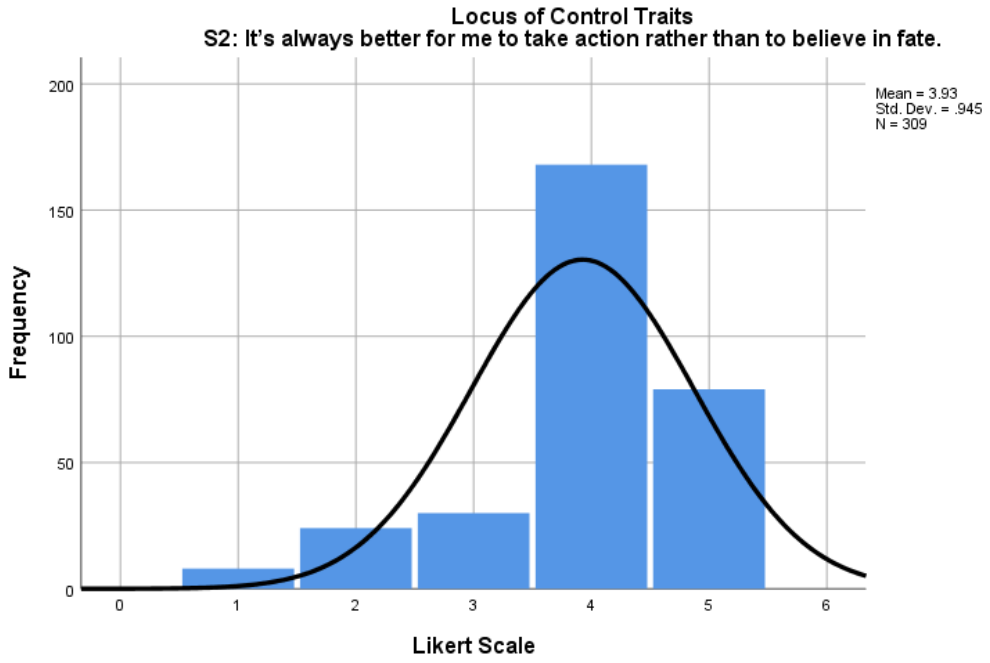


Figure 4.13: Locus of Control – It's always better for me to take action rather than to believe in fate.

Figure 4.13 shows that the highest number of students which obtained 168 agrees to the statement – "It's always better for me to take action rather than to believe in fate". After that, the strongly agree to this statement are occupied the total number of 79 students which located the second-highest score in this statement, followed by 30 number of students maintain neutral, 24 disagree and the least of the student, eight students strongly disagree.

Table 4.9: Frequency for “It’s always better for me to take action rather than to believe in fate.”

Locus of Control Traits (S2)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	8	2.6	2.6	2.6
	2	24	7.8	7.8	10.4
	3	30	9.7	9.7	20.1
	4	168	54.4	54.4	74.4
	5	79	25.6	25.6	100.0
	Total	309	100.0	100.0	

Table 4.9 shows that the number of frequencies for "It's always better for me to take action rather than to believe in fate." The total results toward disagree are around 10.4% overall. While for the percentage of respondents toward agree are total 80%, which cover four over 5 in total number. Therefore, it can conclude that the respondents are more towards agree to this statement.

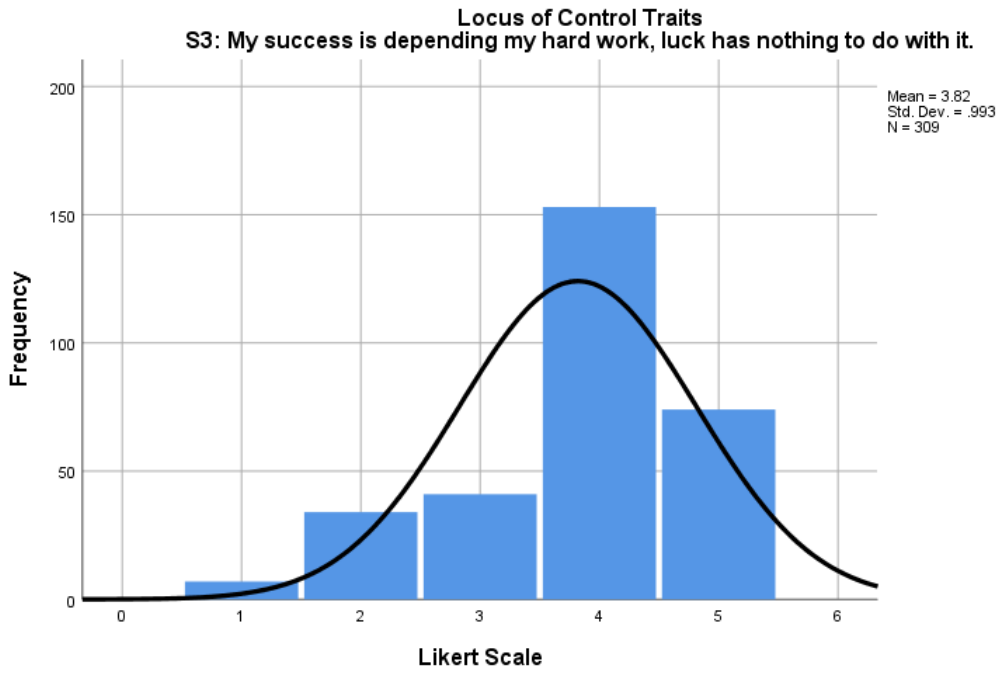


Figure 4.14: Locus of Control – My success is depending my hard work, luck has nothing to do with it.

Figure 4.14 shows that the highest number of students which obtained 153 agrees to the statement – "My success is depending my hard work; luck has

nothing to do with it". After that, the strongly agree to this statement are occupied the total number of 74 students which located the second-highest score in this statement, followed by 41 number of students maintain neutral, 34 disagree and the least of the student, seven students strongly disagree.

Table 4.10: Frequency for “My success is depending my hard work, luck has nothing to do with it.”

Locus of Control Traits (S3)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	7	2.3	2.3	2.3
	2	34	11.0	11.0	13.3
	3	41	13.3	13.3	26.5
	4	153	49.5	49.5	76.1
	5	74	23.9	23.9	100.0
	Total	309	100.0	100.0	

Table 4.10 shows that the number of frequencies for "My success is depending my hard work; luck has nothing to do with it." The total results toward disagree are around 13.3% overall. While for the percentage of respondents toward agree are total, 73.4% in the total number. Therefore, it can conclude that the respondents are more towards agree to this statement.

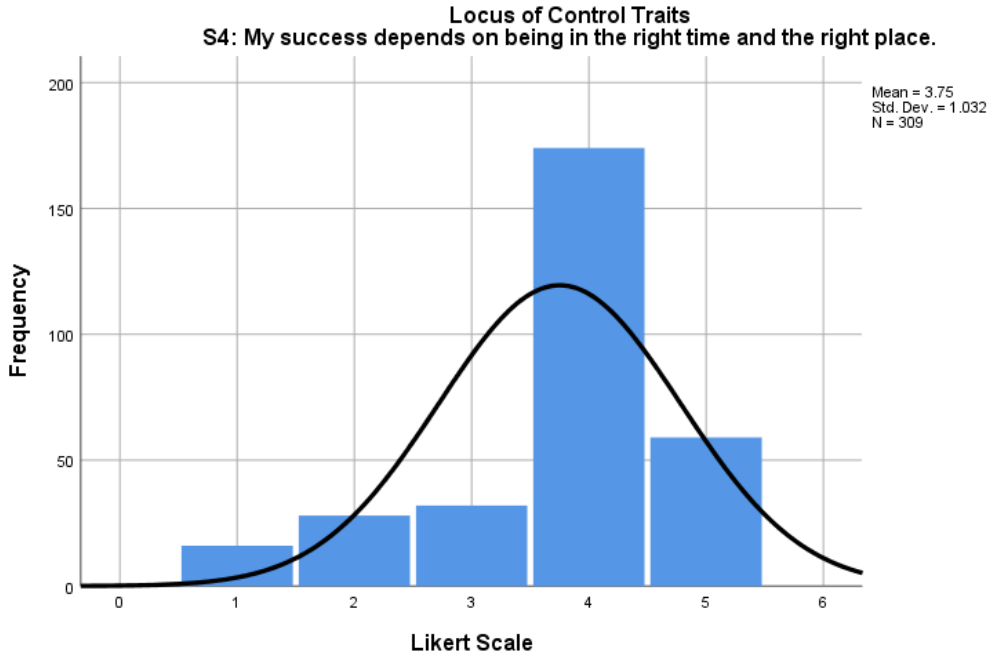


Figure 4.15: Locus of Control – My success depends on being in the right time and the right place.

Figure 4.15 shows that the highest number of students which obtained 174 agrees to the statement – "My success depends on being in the right time and the right place". After that, the strongly agree to this statement are occupied the total number of 59 students which located the second-highest score in this statement, followed by 32 number of students maintain neutral, 28 disagree and the least of the student, 16 students strongly disagree.

Table 4.11: Frequency for "My success depends on being in the right time and the right place."

Locus of Control Traits (S4)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	16	5.2	5.2	5.2
	2	28	9.1	9.1	14.2
	3	32	10.4	10.4	24.6
	4	174	56.3	56.3	80.9
	5	59	19.1	19.1	100.0
	Total	309	100.0	100.0	

Table 4.11 shows that the number of frequencies for "My success depends on being in the right time and the right place." The total results toward disagree are around 14.2% overall. While for the percentage of respondents toward agree are total, 75.4% in the total number. Therefore, it can conclude that the respondents are more towards agree to this statement.

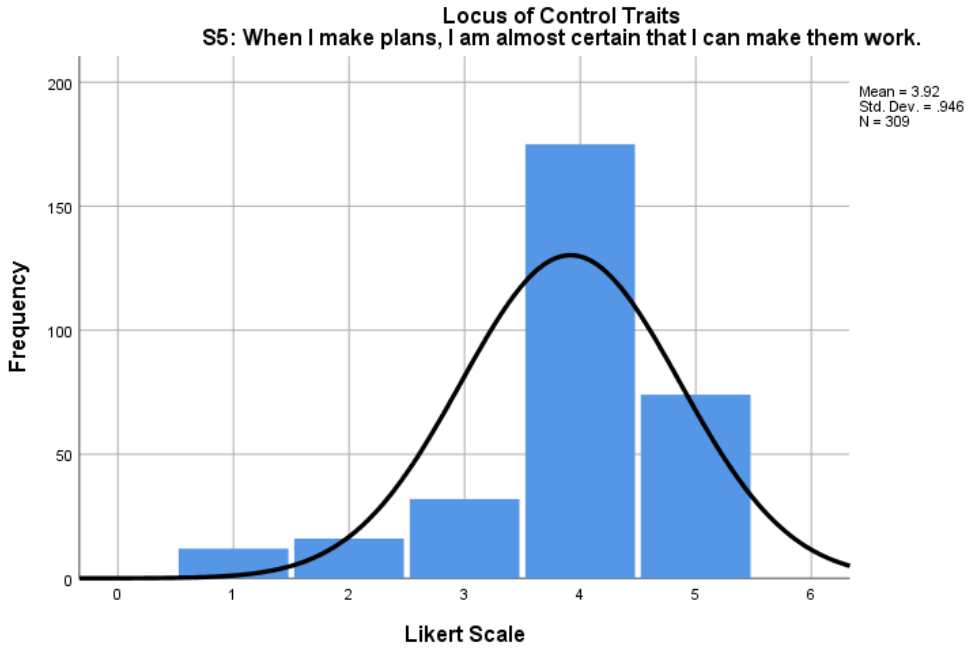


Figure 4.16: Locus of Control – When I make plans, I am almost certain that I can make them work.

Figure 4.16 shows that the highest number of students which obtained 175 are agree to the statement – "When I make plans, I am almost certain that I can make them work". After that, the strongly agree to this statement are occupied the total number of 74 students which located the second-highest score in this statement, followed by 32 number of students maintain neutral, 16 disagree and the least of the student, 12 students strongly disagree.

Table 4.12: Frequency for “When I make plans, I am almost certain that I can make them work.”

Locus of Control Traits (S5)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	12	3.9	3.9	3.9
	2	16	5.2	5.2	9.1
	3	32	10.4	10.4	19.4
	4	175	56.6	56.6	76.1
	5	74	23.9	23.9	100.0
	Total	309	100.0	100.0	

Table 4.12 shows the number of frequencies for "When I make plans, I am almost certain that I can make them work." The total results toward disagree are around 9.1% overall. While for the percentage of respondents toward agree are total, 80.5% in the total number. Therefore, it can conclude that the respondents are more towards agree to this statement.

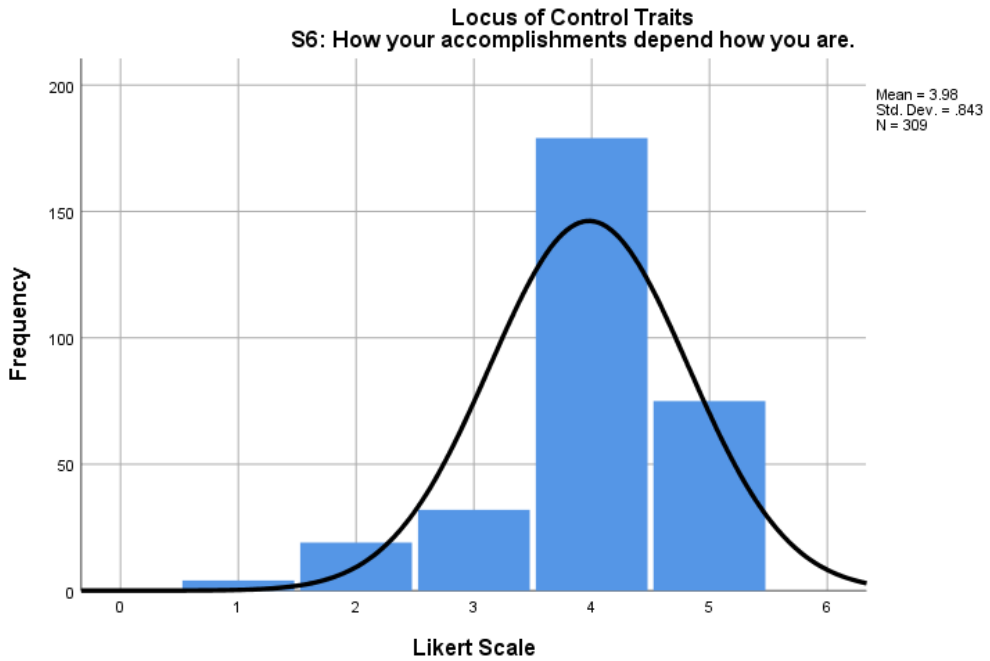


Figure 4.17: Locus of Control – How your accomplishments depend how you are.

Figure 4.17 shows that the highest number of students which obtained 179 agrees to the statement – "How your accomplishments depend how you are". After that, the strongly agree to this statement are occupied the total number of

75 students which located the second-highest score in this statement, followed by 32 number of students maintain neutral, 19 disagree and the least of the student, four students strongly disagree.

Table 4.13: Frequency for “How your accomplishments depend how you are.”

Locus of Control Traits (S6)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	1.3	1.3	1.3
	2	19	6.1	6.1	7.4
	3	32	10.4	10.4	17.8
	4	179	57.9	57.9	75.7
	5	75	24.3	24.3	100.0
	Total	309	100.0	100.0	

Table 4.13 shows that the number of frequencies for "How your accomplishments depend how you are." The total results toward disagree are around 7.4% overall. While for the percentage of respondents toward agree are total, 82.2% in the total number. Therefore, it can conclude that the respondents are more towards agree to this statement.

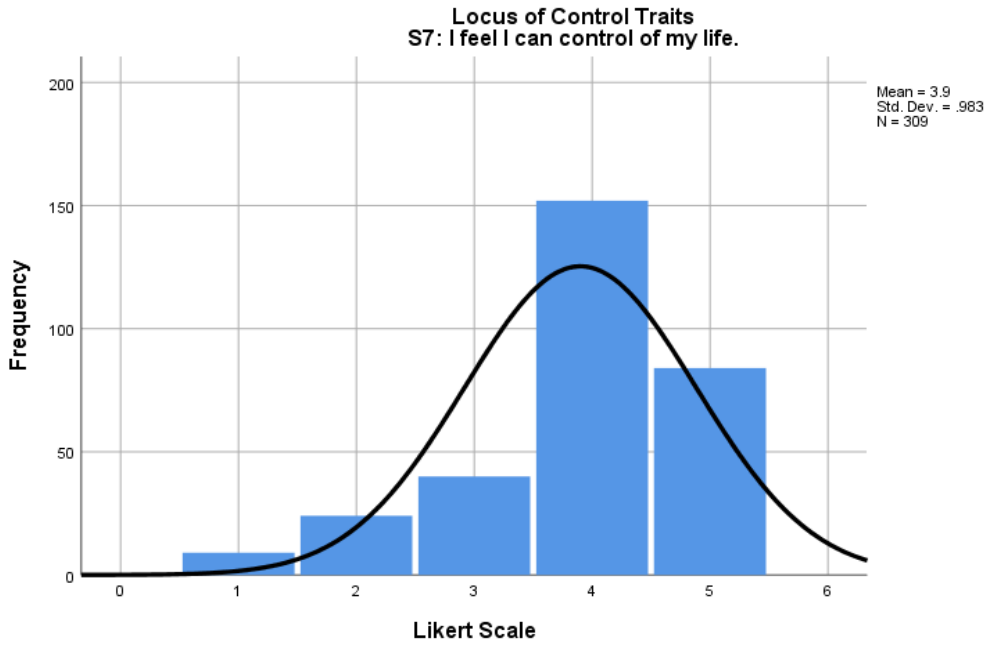


Figure 4.18: Locus of Control – I feel I can control of my life.

Figure 4.18 shows that the highest number of students which obtained 152 agrees to the statement – "I feel I can control of my life". After that, the strongly agree to this statement are occupied the total number of 84 students which located the second-highest score in this statement, followed by 40 number of students maintain neutral, 24 disagree and the least of the student, nine students strongly disagree.

Table 4.14: Frequency for “I feel I can control of my life.”

Locus of Control Traits (S7)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	9	2.9	2.9	2.9
	2	24	7.8	7.8	10.7
	3	40	12.9	12.9	23.6
	4	152	49.2	49.2	72.8
	5	84	27.2	27.2	100.0
	Total	309	100.0	100.0	

Table 4.14 shows the number of frequencies for "I feel I can control my life." The total results toward disagree are around 12.62% overall. While for the percentage of respondents toward agree are total of 76.97% in total number. Therefore, it can conclude that the respondents are more towards agree to this statement.

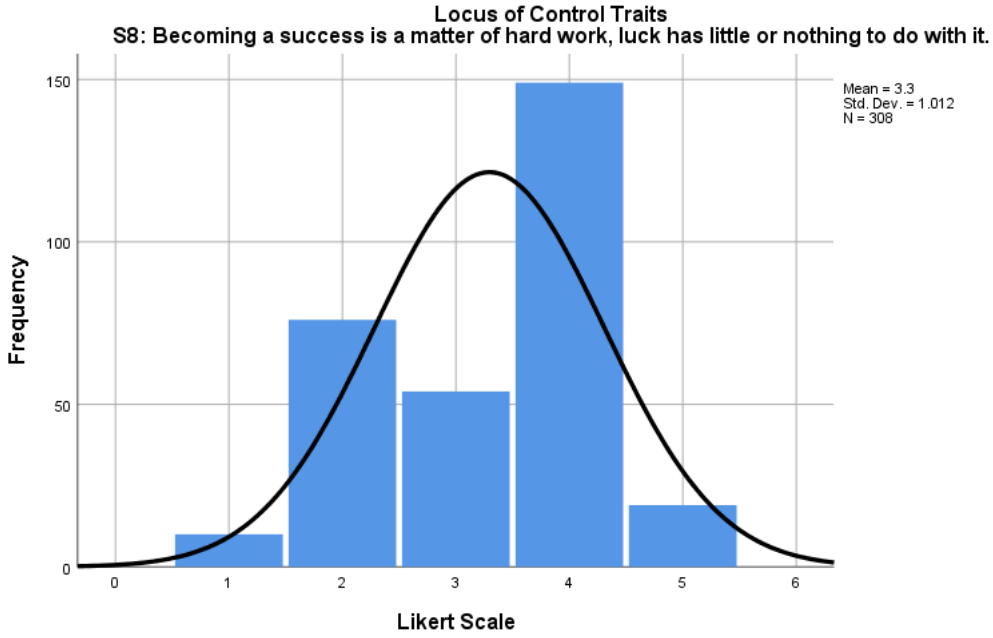


Figure 4.19: Locus of Control – Becoming a success is a matter of hard work, luck has little or nothing to do with it.

Figure 4.19 shows that the highest number of students which obtained 149 agrees to the statement – "Becoming a success is a matter of hard work, luck has little or nothing to do with it". After that, they disagree to this statement are occupied the total number of 76 students which located the second-highest score in this statement, followed by 54 number of students consider neutral, 19 strongly agree and the least of the student, ten students strongly disagree.

Table 4.15: Frequency for "Becoming a success is a matter of hard work, luck has little or nothing to do with it."

Locus of Control Traits (S8)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	10	3.2	3.2	3.2
	2	76	24.6	24.7	27.9
	3	54	17.5	17.5	45.5
	4	149	48.2	48.4	93.8
	5	19	6.1	6.2	100.0
	Total	308	99.7	100.0	
Missing	System	1	.3		
Total		309	100.0		

Table 4.15 shows that the number of frequencies for "Becoming a success is a matter of hard work, luck has little or nothing to do with it." The total results toward disagree are around 27.9% overall. While for the percentage of respondents toward agree are total, 54.6% in the total number. From this result shows that the disagree are almost occupied above 30% in overall. This is because most of the people would think that luck will be played as an important issue which will lead the people to success. However, 54.6% of the respondents think that that's is not related to the road of success. Therefore, it can conclude that the respondents are more towards agree to this statement.

4.2.8.2 Descriptive Analysis: Risk-taking Traits (Adverse)

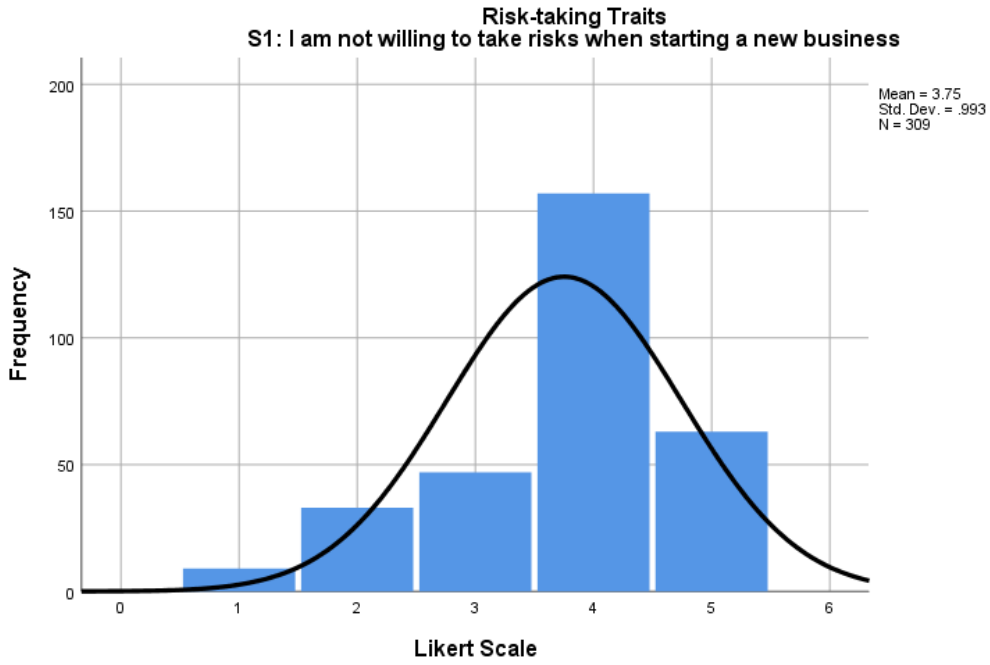


Figure 4.20: Risk-taking Traits – I am not willing to take risks when starting a new business (Adverse).

Figure 4.20 shows that the highest number of students which obtained 157 agrees to the statement – "I am not willing to take risks when starting a new business (Adverse)". After that, the strongly agree to this statement are occupied the total number of 63 students which located the second-highest score in this statement, followed by 47 number of students consider neutral, 33 students disagree, and only nine students strongly disagree.

Table 4.16: Frequency for “I am not willing to take risks when starting a new business.”

Risk-taking Traits (S1)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	9	2.9	2.9	2.9
	2	33	10.7	10.7	13.6
	3	47	15.2	15.2	28.8
	4	157	50.8	50.8	79.6
	5	63	20.4	20.4	100.0
	Total	309	100.0	100.0	

Table 4.16 shows that the number of frequencies for "I am not willing to take risks when starting a new business. (Adverse)" The total results toward disagree is around 13.6% overall. While for the percentage of respondents toward agree are total, 71.2% in the total number. From this result shows that the agree are already occupied more than the respondents towards disagree. Therefore, it can include two types of people, one who likes high profits with high risks, and the other who likes to have a stable income.

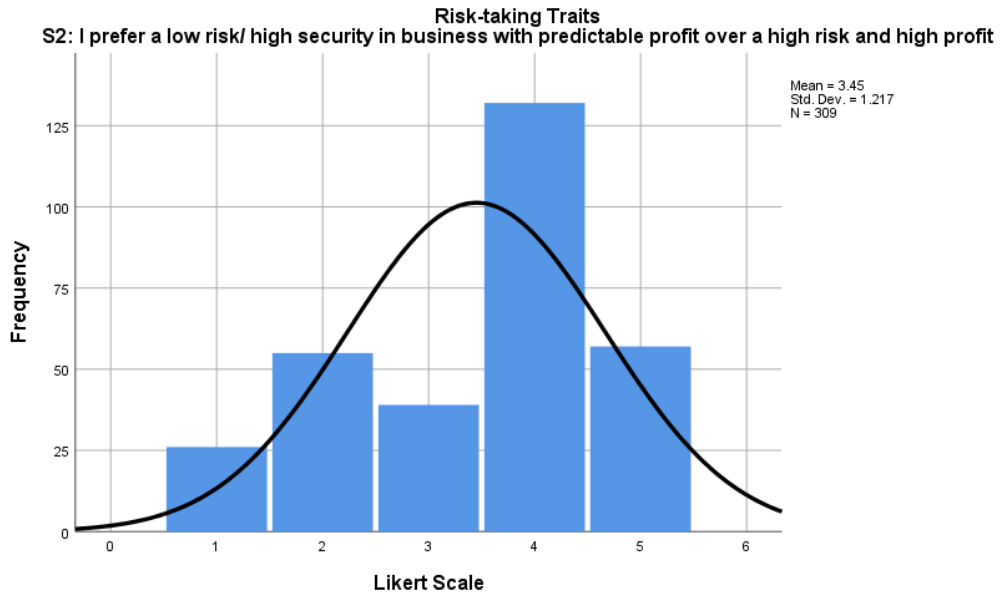


Figure 4.21: Risk-taking Traits – I prefer a low risk/ high security in business with predictable profit over a high risk and high profit (Adverse).

Figure 4.21 shows that the highest number of students which obtained 132 agrees to the statement – "I prefer a low risk/ high security in business with

predictable profit over a high risk and high profit (Adverse)". After that, the strongly agree to this statement are occupied a total number of 57 students which located the second-highest score in this statement, followed by 55 number of students consider disagree, 39 maintain neutral and the least of the student, 26 students strongly disagree.

Table 4.17: Frequency for “I prefer a low risk/ high security in business with predictable profit over a high risk and high profit.”

Risk-taking Traits (S2)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	26	8.4	8.4	8.4
	2	55	17.8	17.8	26.2
	3	39	12.6	12.6	38.8
	4	132	42.7	42.7	81.6
	5	57	18.4	18.4	100.0
	Total	309	100.0	100.0	

Table 4.17 shows that the number of frequencies for "I prefer a low risk/ high security in business with predictable profit over a high risk and high profit (Adverse)." The total results toward disagree are around 26.2% overall. While for the percentage of respondents toward agree are total, 61.1% in the total number. From this result shows that the agree are occupied more than the respondents towards disagree. Therefore, it can conclude that most of the people would prefer low risk in business compare to high risk.

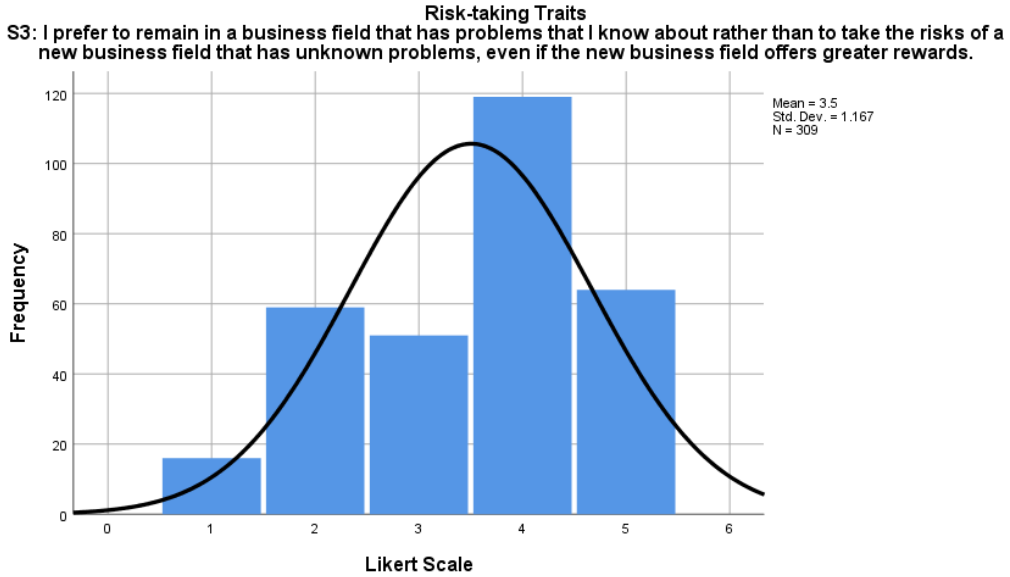


Figure 4.22: Risk-taking Traits – I prefer to remain in a business field that has problems that I know about rather than to take the risks of a new business field that has unknown problems, even if the new business field offers greater rewards (Adverse).

Figure 4.22 shows that the highest number of students which obtained 119 agrees to the statement – "I prefer to remain in a business field that has problems that I know about rather than to take the risks of a new business field that has unknown problems, even if the new business field offers greater rewards (Adverse)". After that, the strongly agree to this statement are occupied the total number of 64 students which located the second-highest score in this statement, followed by 59 number of students consider disagree, 51 neutral and the least of the student, 16 students strongly disagree.

Table 4.18: Frequency for “I prefer to remain in a business field that has problems that I know about rather than to take the risks of a new business field that has unknown problems, even if the new business field offers greater rewards. (Adverse)”

Risk-taking Traits (S3)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	16	5.2	5.2	5.2
	2	59	19.1	19.1	24.3
	3	51	16.5	16.5	40.8
	4	119	38.5	38.5	79.3
	5	64	20.7	20.7	100.0
	Total	309	100.0	100.0	

Table 4.18 shows that the number of frequencies for "I prefer to remain in a business field that has problems that I know about rather than to take the risks of a new business field that has unknown problems, even if the new business field offers greater rewards. (Adverse)" The total results toward disagree is around 24.3% overall. While for the percentage of respondents toward agree are total, 59.2% in the total number.

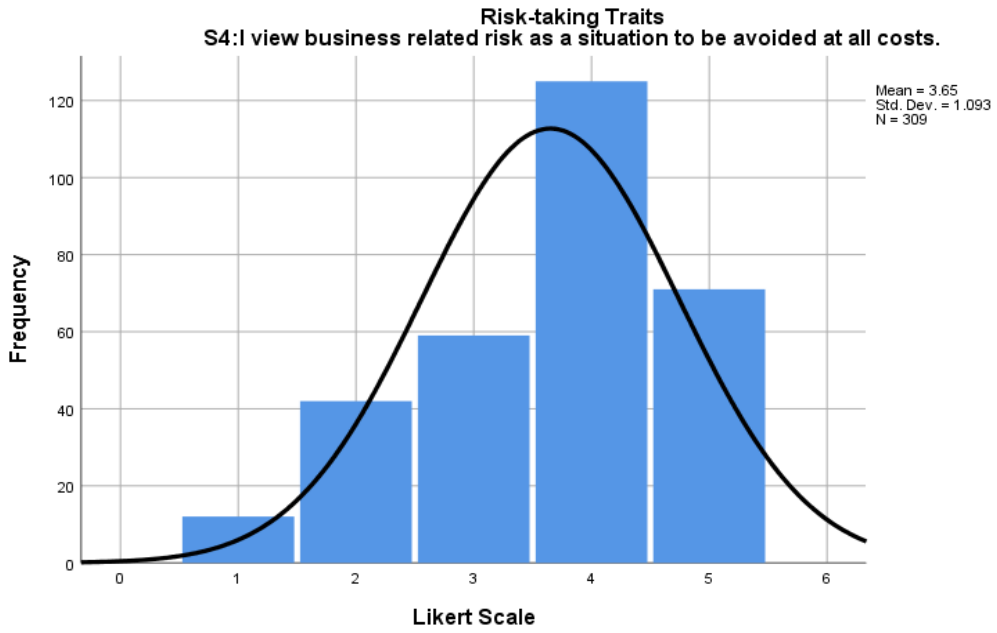


Figure 4.23: Risk-taking Traits – I view business related risk as a situation to be avoided at all costs. (Adverse)

Figure 4.23 shows that the highest number of students which obtained 125 agrees to the statement – "I view business-related risk as a situation to be avoided at all costs. (Adverse)". After that, the strongly agree to this statement are occupied the total number of 71 students which located the second-highest score in this statement, followed by 59 number of students maintain neutral, 42 disagree and the least of the student, 12 students strongly disagree.

Table 4.19: Frequency for "I view business related risk as a situation to be avoided at all costs."

Risk-taking Traits (S4)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	12	3.9	3.9	3.9
	2	42	13.6	13.6	17.5
	3	59	19.1	19.1	36.6
	4	125	40.5	40.5	77.0
	5	71	23.0	23.0	100.0
	Total	309	100.0	100.0	

Table 4.19 shows that the number of frequencies for "I view business related risk as a situation to be avoided at all costs." The total results toward disagree are around 17.5% overall. While for the percentage of respondents toward agree are total, 63.5% in the total number. From this result shows that the agree are occupied more than the respondents towards disagree. Therefore, it can conclude that most of the people would think that the risk related to business would not be able to be avoided.

4.2.8.3 Descriptive Analysis: Need for Achievement Traits

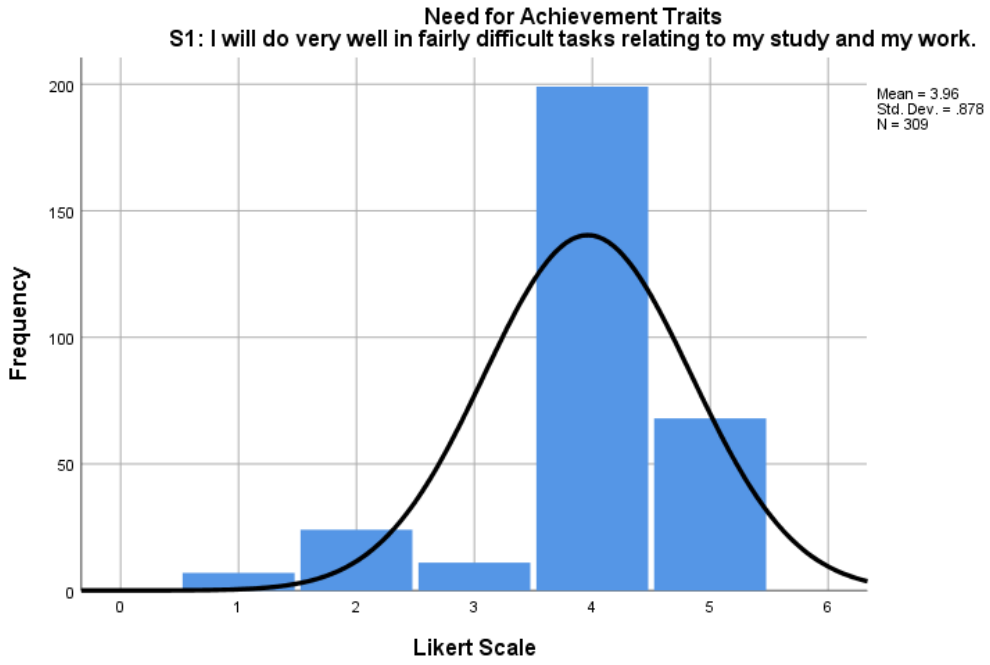


Figure 4.24: Need for Achievement Traits – I will do very well in fairly difficult tasks relating to my study and my work.

Figure 4.24 shows that the highest number of students which obtained 199 agrees to the statement – "I will do very well in fairly difficult tasks relating to my study and my work.". After that, the strongly agree to this statement are occupied a total number of 68 students which located the second-highest score in this statement, followed by 24 number of students consider disagree, 11 maintain neutral and the least of the student, seven students strongly disagree.

Table 4.20: Frequency for "I will do very well in fairly difficult tasks relating to my study and my work."

Need for Achievement Traits (S1)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	7	2.3	2.3	2.3
	2	24	7.8	7.8	10.0
	3	11	3.6	3.6	13.6
	4	199	64.4	64.4	78.0
	5	68	22.0	22.0	100.0
	Total	309	100.0	100.0	

Table 4.20 shows that the number of frequencies for "I will do very well in fairly difficult tasks relating to my study and my work.". The total results toward disagree are around 10.0% in overall. While for the percentage of respondents toward agree are total, 86.4% in the total number. From this result shows that the agree are occupied more than the respondents towards disagree. Therefore, it can show that most of the engineering students would able to perform well in their task and study.

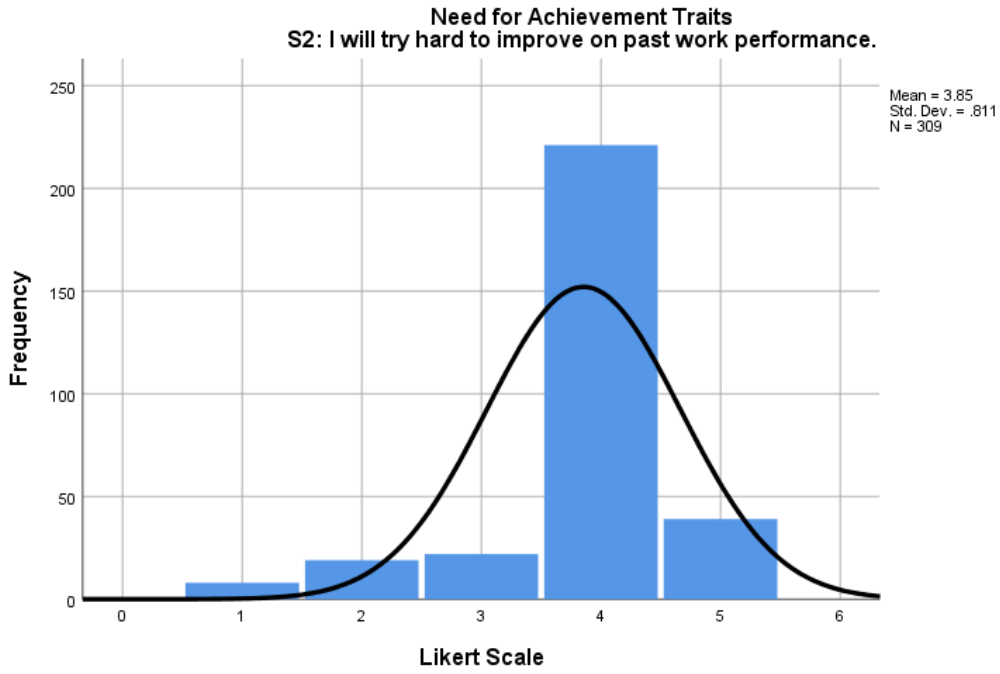


Figure 4.25: Need for Achievement Traits – I will try hard to improve on past work performance.

Figure 4.25 shows that the highest number of students which obtained 221 agrees to the statement – "I will try hard to improve on past work performance.". After that, the strongly agree to this statement are occupied a total number of 39 students which located the second-highest score in this statement, followed by 22 number of students consider disagree, 19 maintain neutral and the least of the student, eight students strongly disagree.

Table 4.21: Frequency for “I will try hard to improve on past work performance.”

Need for Achievement Traits (S2)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	8	2.6	2.6	2.6
	2	19	6.1	6.1	8.7
	3	22	7.1	7.1	15.9
	4	221	71.5	71.5	87.4
	5	39	12.6	12.6	100.0
	Total	309	100.0	100.0	

Table 4.21 shows that the number of frequencies for "I will try hard to improve on past work performance.". The total results toward disagree are around 8.7% in overall. While for the percentage of respondents toward agree are total, 84.1% in the total number. From this result shows that the agree are occupied more than the respondents towards disagree. Therefore, it can conclude that most of the engineering students would keep going improvement based on past work experiences or performance.

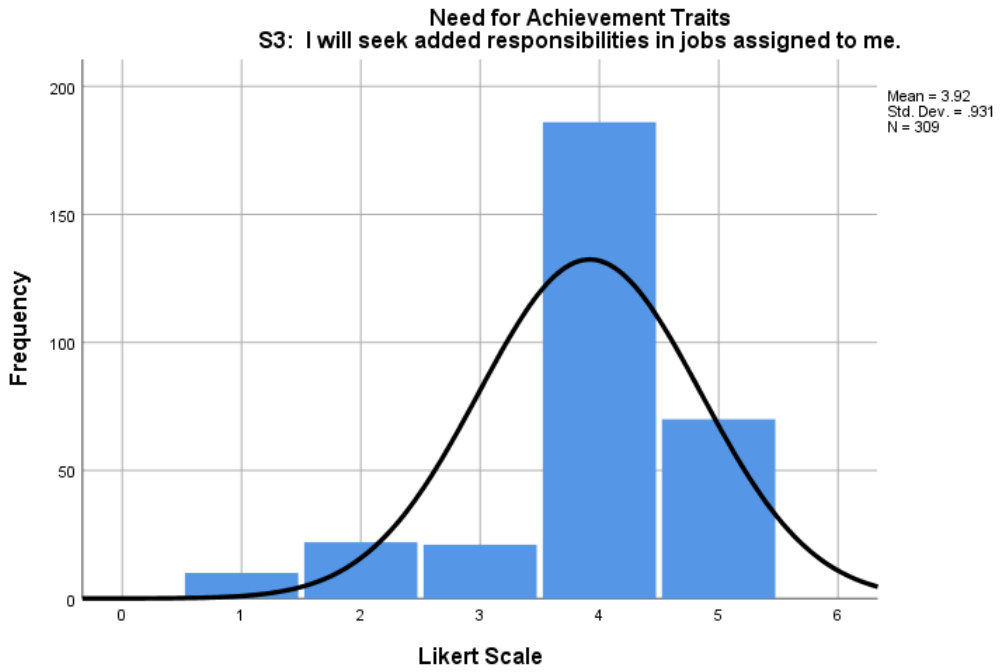


Figure 4.26: Need for Achievement Traits – I will seek added responsibilities in jobs assigned to me.

Figure 4.26 shows that the highest number of students which obtained 186 agrees to the statement – "I will seek added responsibilities in jobs assigned to me.". After that, the strongly agree to this statement are occupied a total number of 70 students which located the second-highest score in this statement, followed by 22 number of students consider disagree, 21 maintain neutral and the least of the student, ten students strongly disagree.

Table 4.22: Frequency for “I will seek added responsibilities in jobs assigned to me.”

Need for Achievement Traits (S3)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	10	3.2	3.2	3.2
	2	22	7.1	7.1	10.4
	3	21	6.8	6.8	17.2
	4	186	60.2	60.2	77.3
	5	70	22.7	22.7	100.0
	Total	309	100.0	100.0	

Table 4.22 shows that the number of frequencies for "I will seek added responsibilities in jobs assigned to me.". The total results toward disagree are around 10.4% in overall. While for the percentage of respondents toward agree are total, 82.9% in the total number. From this result shows that the agree are occupied more than the respondents towards disagree. Hence, it shows that most engineering students have a strong sense of responsibility in both work and study. Therefore, it can clearly show that engineering students required an entrepreneurial attitude.

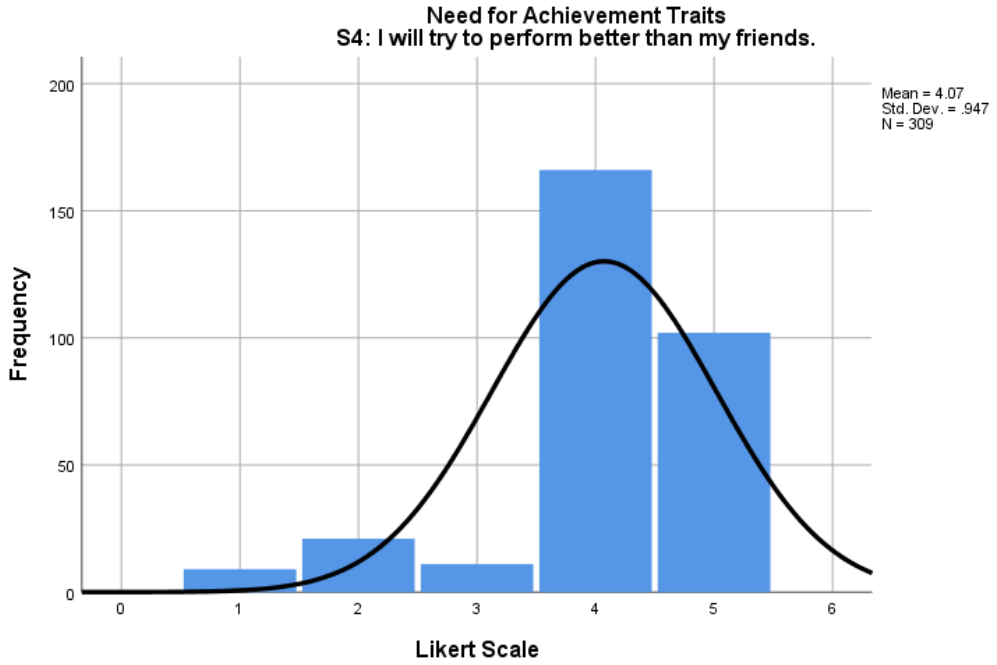


Figure 4.27: Need for Achievement Traits – I will try to perform better than my friends.

Figure 4.27 shows that the highest number of students which obtained 166 agrees to the statement – "I will try to perform better than my friends.". After that, the strongly agree to this statement are occupied a total number of 102 students which located the second-highest score in this statement, followed by 21 number of students consider disagree, 11 maintain neutral and the least of the student, nine students strongly disagree.

Table 4.23: Frequency for "I will try to perform better than my friends."

Need for Achievement Traits (S4)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	9	2.9	2.9	2.9
	2	21	6.8	6.8	9.7
	3	11	3.6	3.6	13.3
	4	166	53.7	53.7	67.0
	5	102	33.0	33.0	100.0
	Total	309	100.0	100.0	

Table 4.23 shows that the number of frequencies for "I will try to perform better than my friends.". The total results toward disagree are around

9.7% in overall. While for the percentage of respondents toward agree are total, 86.7% in the total number. From this result shows that the agree are occupied more than the respondents towards disagree. Hence, it shows that most engineering students are able to view their friends as a competitor in order to improve themselves and to get better in their performance. Therefore, it can clearly show that engineering students required an entrepreneurial attitude.

4.3 Scale Measurement

4.3.1 Reliability Test

Before going through the further analyses, the dependent variable (Entrepreneurial Attitude) and independent variables (Locus of Control, Risk-taking and Need for Achievement) are going through the reliability test in order to get the consistency of the items which are grouped. Hence, all of the results of the reliability test are showing in below of the table.

Table 4.24: Results of Reliability Test for Variables

Variables	Cronbach's alpha coefficient	Strength of Association	Number of Items
Dependent Variable (DV)			
Entrepreneurial Attitude	0.862	Excellent	5
Independent Variables (IV)			
Locus of Control (IV1)	0.835	Excellent	8
Risk-taking (IV2)	0.793	Good	4
Need for Achievement (IV3)	0.858	Excellent	4

Zikmund *et al*. (2013) stated that the rule of thumb for the size of Cronbach's alpha coefficient shows the correlation strength of the range of Cronbach's alpha coefficient. Hence, there are no variables that failed to meet the minimum acceptable requirement of Cronbach's alpha coefficient, which is 0.60 in this study. The dependent variable – Entrepreneurial Attitude obtained the highest coefficient – 0.862 > 0.80, which consider as excellent in the strength of association in this study. Besides, two of the independent variables also meet up the expectation which obtained excellent in the strength of association and

one of the independent variables are obtained very closed to excellent. The value of Locus of Control (IV1) are getting 0.835 and the Need for Achievement (IV3) which obtained 0.858, which pass over the range of 0.800. While for the last of the independent variable are Risk-taking (IV2) which obtained the smallest value, which 0.793 very close to 0.800 in this study. Therefore, all variables have a stable and reliable relationship. At the same time, this also indicates that the entries of each group have a high degree of internal consistency.

4.4 Normality Test

Normality test will be used in this study in order to test the normality of the variables. The main purpose of this test is used to determine the data set collected from the questionnaire is good for the model normal distribution or not. Therefore, Skewness, Kurtosis, Kolmogorov-Smirnov and Shapiro-Wilk are used to perform the normality test in this study.

4.4.1 Kolmogorow[a]-Smirnov and Shapiro-Wilk Test

During conduct, the normality test of the variables, Kolmogorowa-Smirnov and Shapiro-Wilk test will be used to test the data is normal or non-normal. According to Ghasemi and Zahediasl (2012), the significant value < 0.05 mean the test is significant, and the distribution is not normal. Hence, the data collected will be shown on the table below.

Table 4.25: Kolmogorow[a]-Smirnov and Shapiro-Wilk Tests for Dependent Variable

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
EA1	.344	309	.000	.785	309	.000
EA2	.286	309	.000	.809	309	.000
EA3	.274	309	.000	.748	309	.000
EA4	.278	309	.000	.781	309	.000
EA5	.316	309	.000	.806	309	.000

a. Lilliefors Significance Correction

Based on Table 4.25 shown, all the states of the dependent variable are .000 insignificant value which is smaller than 0.05 ($p < 0.05$). Therefore, it is considered as non-normal in this study.

Table 4.26: Kolmogorow[a]-Smirnov and Shapiro-Wilk Tests for Independent Variables

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
LOC1	.354	308	.000	.757	308	.000
LOC2	.332	308	.000	.796	308	.000
LOC3	.308	308	.000	.836	308	.000
LOC4	.350	308	.000	.794	308	.000
LOC5	.342	308	.000	.777	308	.000
LOC6	.334	308	.000	.788	308	.000
LOC7	.305	308	.000	.822	308	.000
LOC8	.302	308	.000	.842	308	.000
RT1	.310	308	.000	.841	308	.000
RT2	.285	308	.000	.864	308	.000
RT3	.257	308	.000	.880	308	.000
RT4	.260	308	.000	.875	308	.000
NFA1	.381	308	.000	.721	308	.000
NFA2	.414	308	.000	.678	308	.000
NFA3	.363	308	.000	.756	308	.000
NFA4	.338	308	.000	.742	308	.000

a. Lilliefors Significance Correction

Other than the dependent variable, the independent variable also obtained the significant value .000 which < 0.05. Therefore, that is not normal in this normality test as all of the significant values getting 0.000 no matter in the dependent or independent variable.

4.4.2 Skewness and Kurtosis Test

Skewness and Kurtosis test are going used to test the dependent and independent variable in normality test also. Based on the theory, the z-scores of Skewness and Kurtosis should be in the range of -1.96 to +1.96 that show the analyses are normal. (Ghasemi and Zahediasl, 2012) If the data value is shown are greater

than +1.96 and lesser than -1.96 is non-normal distribution. Therefore, the Skewness and Kurtosis test have run, and all of the results are tabulated at below.

Table 4.27: Skewness and Kurtosis for Dependent Variable and Independent Variables.

Construct	Skewness			Kurtosis		
	Statistic	Std. Error	z-Score	Statistic	Std. Error	z-Score
Dependent Variable						
EA (S1)	-1.214	0.139	-8.734	1.485	0.276	5.380
EA (S2)	-1.017	0.139	-7.317	1.124	0.276	4.072
EA (S3)	-1.435	0.139	-10.320	2.412	0.276	8.739
EA (S4)	-1.236	0.139	-8.892	1.925	0.276	6.975
EA (S5)	-1.028	0.139	-7.396	0.593	0.276	2.149
Independent Variables						
LOC (S1)	-1.188	0.139	-8.547	1.694	0.277	6.116
LOC (S2)	-1.149	0.139	-8.266	1.294	0.277	4.671
LOC (S3)	-0.869	0.139	-6.252	0.292	0.277	1.054
LOC (S4)	-1.129	0.139	-8.122	0.868	0.277	3.134
LOC (S5)	-1.312	0.139	-9.439	1.958	0.277	7.069
LOC (S6)	-1.103	0.139	-7.935	1.671	0.277	6.032
LOC (S7)	-1.033	0.139	-7.432	0.856	0.277	3.090
LOC (S8)	-0.448	0.139	-3.223	-0.843	0.277	-3.040
RT (S1)	-0.861	0.139	-6.194	0.342	0.277	1.235
RT (S2)	-0.574	0.139	-4.129	-0.743	0.277	-2.680
RT (S3)	-0.472	0.139	-3.396	-0.773	0.277	-2.790
RT (S4)	-0.619	0.139	-4.453	-0.362	0.277	-1.310
NFA (S1)	-1.427	0.139	-10.270	2.417	0.277	8.726
NFA (S2)	-1.617	0.139	-11.630	3.411	0.277	12.310
NFA (S3)	-1.342	0.139	-9.655	1.954	0.277	7.054
NFA (S4)	-1.455	0.139	-10.470	2.215	0.277	7.996

Table 4.27 have summarized all the Skewness and Kurtosis value of the dependent and independent variables. As the table is shown, it is significantly showing that most of the z-scores are lesser than -1.96 and higher than +1.96. Hence, the collected data of the dependent and independent variable are non-normal distribution.

4.4.3 Multicollinearity

Before going through the Pearson's and Spearman's Rho Correlation Analysis, multicollinearity has to be run through in order to check the relationship between independent variables and dependent variable. Therefore, multicollinearity test has been conducted by SPSS and listed at the below table.

Table 4.28: Multicollinearity Statistic

	Collinearity Statistics		
Model	**Tolerance**	**VIF**	**Indication**
Locus of Control Traits	.555	1.801	No Multicollinearity Issue
Risk-taking Traits	.679	1.473	No Multicollinearity Issue
Need for Achievement Traits	.642	1.558	No Multicollinearity Issue

Dependent Variable: Entrepreneurial Attitude

As the table 4.28 shown, all the independent variables have achieved the requirement which is larger than 0.1 (tolerance > 0.1) in tolerance and the Variance Inflation Factor (VIF) also in the range of 1 < VIF < 10. The highest number of VIF that the independent variable get are Locus of Control Traits which obtained 1.801. Hence, follow by 1.558 VIF in Need for Achievement and the least are 1.473 in Risk-taking Traits. Due to the VIF value are in the range of 1 to 10, all the independent variables are no multicollinearity issue which means three of the independent variables does not overlap on each other. It also can be understood as there is no repetition of the same types of independent variables in this study.

4.5 Inferential Analysis

In order to test the relationship between dependent and independent variables to describe and infer the entire population, inferential analysis has to be conducted. Therefore, there are two types of testing that will be used, which are Spearman's Rho Correlation Analysis and Pearson's Correlation Analysis.

4.5.1 Spearman’s Rho Correlation Analysis

Spearman's Rho Correlation was conducted at the same time. Actually, it is quite similar to the Pearson Correlation Analysis, just the Spearman's Rho Correlation Analysis is nonparametric correlations. Therefore, due to the results in

Normality Test are showing non-normal, Spearman's Rho Correlation Analysis has to be used to analyses, and the results are shown in the table below.

Table 4.29: Spearman's Rho Correlation Analysis

Correlations

		Entrepreneurial Attitude	Locus of Control Traits	Risk-taking Traits	Need for Achievement Traits
Entrepreneurial Attitude	Correlation Coefficient	1.000	.422**	.387**	.319**
	Sig. (2-tailed)	.	.000	.000	.000
	N	309	308	309	309
Locus of Control Traits	Correlation Coefficient	.422**	1.000	.409**	.276**
	Sig. (2-tailed)	.000	.	.000	.000
	N	308	308	308	308
Risk-taking Traits	Correlation Coefficient	.387**	.409**	1.000	.222**
	Sig. (2-tailed)	.000	.000	.	.000
	N	309	308	309	309
Need for Achievement Traits	Correlation Coefficient	.319**	.276**	.222**	1.000
	Sig. (2-tailed)	.000	.000	.000	.
	N	309	308	309	309

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

According to Table 4.29, all of the Spearman's Rho correlation analyses are tabulated, and it shows that all the independent variable consists of a positive relationship to the dependent variable. Positive relationship means that the dependent and independent variable are moving in the same direction on the X-axis and Y-axis positively. According to Weir (2015), the coefficient lesser than 0.4 is weak at the strength of association. Therefore, the risk-taking and need for achievement are weak relationships to entrepreneurial attitude while the locus of control is a moderate relationship to entrepreneurial attitude.

4.6 Regression Analysis

Other than testing the correlation between the independent and dependent variables, regression analysis has performed to check the statistical relationships

between independent and dependent variables. This analysis will be conducted by Simple Linear Regression and Multiple Linear Regression.

4.6.1 Simple Linear Regression

In order to test whether the variable is deterministic, Simple Linear Regression has run through, and all the results are tabulated at the below table.

Table 4.30: Simple Linear Regression

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
(Constant)	.653	.179		3.656	.000	.302	1.005
MeanLOC	.434	.058	.386	7.532	.000	.320	.547
MeanRT	.181	.038	.219	4.721	.000	.106	.257
MeanNFA	.278	.046	.286	6.001	.000	.187	.370

a. Dependent Variable: MeanEA

From the table have shown that all of the variables are obtained 0.000, which are < 0.05 in significant. Therefore, the statistically significant relationship is consisting of the variables. Other than that, based on the total results that get from the Simple Linear Regression, there are 38.6% of the respondent more towards the Locus of Control Traits (IV1) are the variable that affects to the Entrepreneurial Attitude (DV) while 28.6% of the respondent thinks that the Need for Achievement Traits (IV3) as the important traits in Entrepreneurial Attitude (DV). While for the least of the respondent – 21.9% feels that the Risk-taking Traits (IV2) are the main role in Entrepreneurial Attitude (DV).

4.6.2 Multiple Linear Regression

Multiple Linear Regression is quite similar to the linear regression, which is used to predict the statistical relationship between the dependent and independent variable. The only different of the Multiple Linear Regression is it will be more tested in independent variable compare to Simple Linear

Regression. (Sekaran & Bougie, 2013) Therefore, for represented the Multiple Linear Regression can be explained by Normal P-P Plot of Regression and Scatterplot.

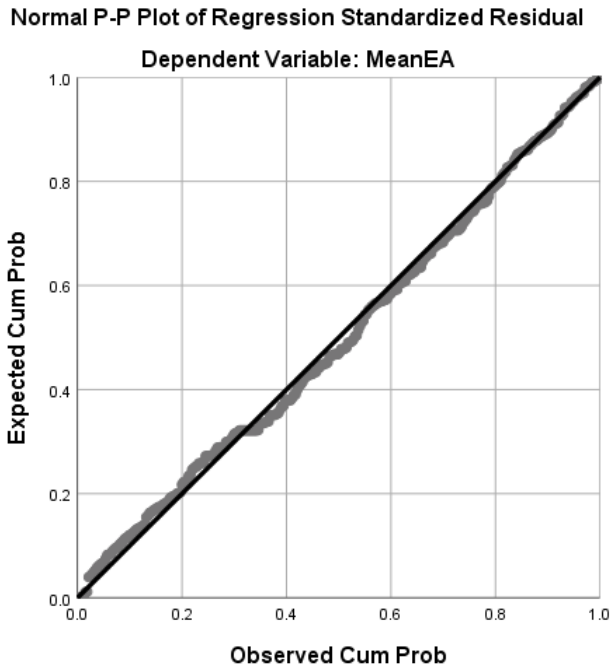


Figure 4.28: Normal P-P Plot of Regression Standardized Residual

Figure 4.28 shows the plot and a straight line positively. Based on the plot that surrounded the straight line, it was very close to the straight line, which means the correlation strength between the Independent Variables and Dependent Variable are strong enough. This is because of the far the plot from the line, the weak of the strength of association. (Weir, 2015)

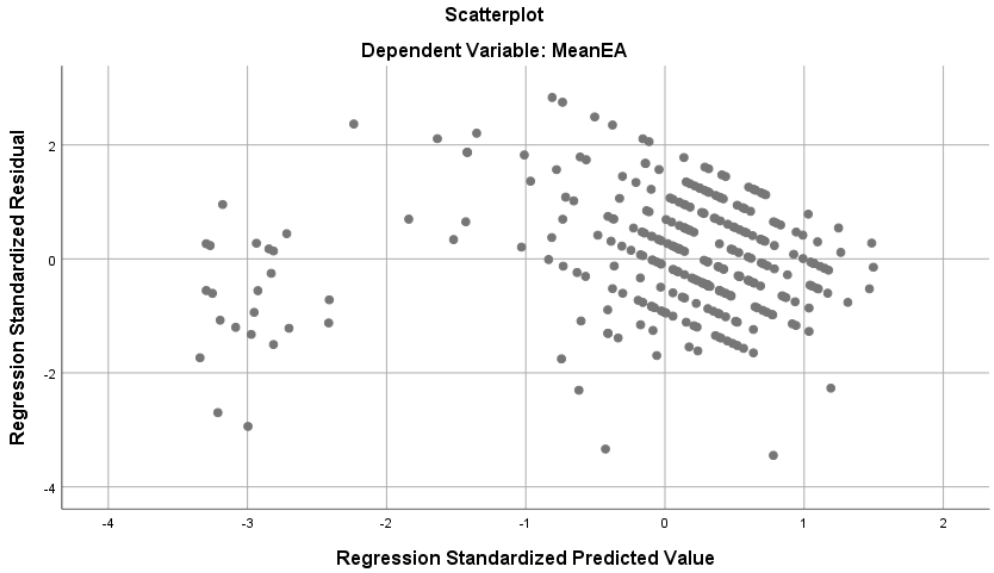


Figure 4.29: Scatterplot

Based on the Figure 4.29 – Scatterplot also significant shows that most of the plot is more towards the right-hand side, which means most of the respondents are more toward positively in Entrepreneurial Attitude. Therefore, it can be concluded as the Engineering Students are more positively towards Entrepreneurial Attitude.

4.6.3 Differences Test

In order to investigate the differences between public and private universities, multiple linear regression analysis was carried out to examine the differences between these two types of universities. Thus, the results of each type of the universities are showing at below Figure.

Table 4.31: Differences Test for Public Universities

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
(Constant)	.776	.266		2.915	.004	.250	1.302
MeanLOC	.333	.079	.303	4.205	.000	.176	.489
MeanRT	.111	.052	.144	2.126	.035	.008	.215
MeanNFA	.408	.070	.413	5.832	.000	.270	.546

a. Dependent Variable: MeanEA

As Table 4.31 shows that the Risk-taking Trait is obtained 0.035 significant value. However, although the Risk-taking trait is different from the values obtained by other independent variables, it is still less than 0.05 in significant. Therefore, it can be concluded as the statistically significant relationship is consisting of the variables. Other than that, based on the total results that get from the significant value, there are 41.3% of the respondent more towards the Need for Achievement Traits (IV3) are the variable that affects to the Entrepreneurial Attitude (DV) while the 30.3% of the respondent thinks that the Locus of Control Traits (IV1) as the important traits in Entrepreneurial Attitude (DV). While for the least of the respondent – 14.4% feels that the Risk-taking Traits (IV2) are the main role in Entrepreneurial Attitude (DV). These are the results of getting in Public Universities' engineering students.

Table 4.32: Differences Test for Private Universities

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
(Constant)	.494	.238		2.075	.040	.024	.965
MeanLOC	.520	.083	.455	6.266	.000	.356	.684
MeanRT	.240	.056	.272	4.266	.000	.129	.351
MeanNFA	.179	.062	.186	2.897	.004	.057	.301

a. Dependent Variable: MeanEA

As Table 4.32 shows that the Need for Achievement Trait is obtained 0.004 significant value. However, although the Need for Achievement Trait is different from the values obtained by other independent variables, it is still less than 0.05 in significant. Therefore, it can be concluded as the statistically significant relationship is consisting of the variables. Other than that, based on the total results that get from the significant value, there are 45.5% of the respondent more towards the Locus of Control Traits (IV1) are the variable that affects to the Entrepreneurial Attitude (DV) while 27.2% of the respondent thinks that the Risk-taking Traits (IV2) as the important traits in Entrepreneurial

Attitude (DV). While for the least of the respondent – 18.6% feels that the Need for Achievement Traits (IV3) are the main role in Entrepreneurial Attitude (DV). These are the results of getting into Private Universities' engineering students.

4.6.4 Beta Value

Table 4.33: Model Summary for Beta Coefficient

Independent Variable	Standardized Coefficients, Beta (β)	Correlation	Ranking
Locus of Control Traits	.386	0.422**	1
Risk-taking Traits	.219	0.387**	3
Need for Achievement Traits	.286	0.319**	2

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

Table 4.33 has summarized all the Beta Coefficients, β for each of the independent variable based on the regression equation. The ranking for each of the independent variable are listed in Table 4.33, and it is showing the Locus of Control Traits obtained the highest Beta value, which is 0.386 in all independent variables. Followed by Need for Achievement Traits which is (β = 0.286) and the lowest Beta value (β = 0.219) which is Risk-taking Traits. According to the Beta value of Locus of Control Traits, it can be interpreted as 38.6% of engineering students are prefer to Locus of Control Traits, which has a great contribution to Entrepreneurial Attitude. Therefore, the higher the Beta value of the independent variable (Locus of Control Traits, Risk-taking Traits and Need for Achievement Traits), the greater the influences to the independent variable (Entrepreneurial Attitude).

4.7 Hypothesis Testing

Hypothesis 1

H_1: There is a positive significant relationship between personality traits (locus of control) and entrepreneurial attitude.

Table 4.29 shows that the correlation coefficient of Locus of Control Traits and Entrepreneurial Attitude is 0.422**, which is moderate in strength. Based on all three independent variables, Locus of Control Traits are the highest correlated to entrepreneurial attitude. Thus, it means that most of the engineering students tend to have a higher of Locus of Control Traits, which will lead to a higher Entrepreneurial Attitude. In contrast, the students with weaker Locus of Control will have lower Entrepreneurial Attitude. Based on Table 4.26, the significant p-value of the Locus of Control Traits is showing .000, which lesser than 0.01 ($p < 0.01$). Therefore, Hypothesis 1 (H_1) is accepted.

Hypothesis 2

H_2: There is a positive significant relationship between personality traits (risk-taking) and entrepreneurial attitude.

Table 4.29 shows that the correlation coefficient of Risk-taking Traits and Entrepreneurial Attitude is 0.387**, which is weak in strength. Based on all three independent variables, Risk-taking Traits are the second-highest correlated to entrepreneurial attitude. As a result, this means that some engineering students are more likely to take risks in entrepreneurship. Therefore, these Risk-taking Traits will lead to a higher Entrepreneurial Attitude. In contrast, the students with weaker Risk-taking Traits will have lower Entrepreneurial Attitude. Based on Table 4.26, the significant p-value of the Risk-taking Traits is showing .000, which lesser than 0.01 ($p < 0.01$). Therefore, Hypothesis 2 (H_2) is accepted.

Hypothesis 3

H_3: There is a positive significant relationship between personality traits (need for achievement) and entrepreneurial attitude.

Table 4.29 shows that the correlation coefficient of Risk-taking Traits and Entrepreneurial Attitude is 0.319**, which is weak in strength. Based on all three independent variables, Need for Achievement Traits are the lowest correlated to entrepreneurial attitude. Therefore, this means that a smaller percentage of respondents from engineering students are more likely to achieve success in order to achieve entrepreneurship. Therefore, this Need for

Achievement Traits will lead to a higher Entrepreneurial Attitude. In contrast, the students with weaker Need for Achievement Traits will have lower Entrepreneurial Attitude. Based on Table 4.26, the significant p-value of the Need for Achievement Traits is showing .000, which lesser than 0.01 ($p < 0.01$). Therefore, Hypothesis 3 (H_3) is accepted.

Hypothesis 4

H_4: There exist differences between the Personality Traits and Entrepreneurial Attitudes of Engineering Students in Public and Private Higher Education Institutions.

Table 4.31 and Table 4.32 shows that results of Public and Private Higher Education Institutions. Based on both of the results, all the significant value that shows in each of the Personality Traits are less than 0.05 ($p < 0.05$). Therefore, this means that the results are very consistent, which all the p-value are less than 0.05. Other than that, Table 4.33 has shown that most of the engineering students in Public University are more towards Need for Achievement Traits while the engineering students in Private University are more towards Locus of Control Traits. Hence, this can conclude that the engineering students in Public University consist more in responsibilities and aggressive mentality while the engineering students at Private University are more in self-efficacy and self-confidence. Moreover, as the results above already showing, there are existing differences between the Personality Traits and Entrepreneurial Attitudes of Engineering Students in Public and Private Higher Education Institutions. Therefore, Hypothesis 4 (H_4) is accepted.

4.8 Contribution of Predictor Variables

Locus of Control Traits obtained the highest Beta coefficient among all three independent variables, which is ($\beta = 0.386$). Thus, Locus of Control was the strongest predictor of the dependent variable (Entrepreneurial Attitude). Therefore, among all the independent variables, the Locus of Control has the strongest relationship with the dependent variable and contributes the most.

Need for Achievement Traits has the second-highest Beta coefficient among three of the independent variables, which is ($\beta = 0.286$). Thus, Need for

Achievement is a weaker predictor to the dependent variable (Entrepreneurial Attitude) compare to Locus of Control Traits. Therefore, among all the independent variables, the Need for Achievement has a weaker relationship with the dependent variable.

Risk-taking Traits has the lowest value of the Beta Coefficient on these three independent variables. This trait is obtained ($\beta = 0.219$), which are the lowest value and the weakest predictor variable to the dependent variable (Entrepreneurial Attitude). Thus, Risk-taking Traits has the weakest relationship and the least contribution to the dependent variable among all three independent variables.

4.9 Summary

The collected data are clearly analyzed in this chapter. Thus, all hypothesis in this study was analyzed through the Social Science Statistical Software Package (SPSS) after extensive demonstration and clarification to determine the results. The next chapter will be the last chapter which focuses on the conclusion of the study, which discusses the limitations of the study and puts forward some suggestions for further study.

Table 4.34: Results on Hypothesis Testing

Research Question	Hypothesis	Results	Decision
Is there any relation between Personality Traits (Locus of Control Traits) and the entrepreneurial attitude among engineering students?	H_1: There is a positive significant relationship between personality traits (locus of control) and entrepreneurial attitude.	Correlation = 0.422** (Positive; Significant) β = 0.386 *P* = .000 < 0.01	H_1 is supported and accepted.
Is there any relation between Personality Traits (Risk-taking Traits)) and the entrepreneurial attitude among engineering students?	H_2: There is a positive significant relationship between personality traits (risk-taking) and entrepreneurial attitude.	Correlation = 0.387** (Positive; Significant) β = 0.219 *P* = .000 < 0.01	H_2 is supported and accepted.
Is there any relation between Personality Traits (Need for Achievement Traits) and the entrepreneurial attitude among engineering students?	H_3: There is a positive significant relationship between personality traits (need for achievement) and entrepreneurial attitude.	Correlation = 0.319** (Positive; Significant) β = 0.286 *P* = .000 < 0.01	H_3 is supported and accepted.
Are there differences between the Personality Traits and Entrepreneurial Attitudes of Engineering Students in Public and Private Higher Education Institutions?	H_4: There exist differences between the Personality Traits and Entrepreneurial Attitudes of Engineering Students in Public and Private Higher Education Institutions.	**Public University** *P* = .004 < 0.05 **Private University** *P* = .040 < 0.05 (Existing Differences)	H_4 is supported and accepted.

Table 4.34 lists all the summarized research questions, hypothesis, results and analyses and the decisions. It is significant shows that all of the hypothesis is obtaining a positive correlation with the dependent variable (Entrepreneurial Attitude), and all of the hypothesis is supported and accepted.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Introduction

In this last chapter, the overall results will be presented during the discussion to support the major hypothesis development. Therefore, there will be some recommendations are presented for the convenience of future researchers working on similar topics in this chapter. Thus, three of the independent variables (Locus of Control Traits, Risk-taking Traits and Need for Achievement Traits) would explain entrepreneurial attitude among engineering students on private or non-private higher education instructions.

The conclusion and recommendations of this comprehensive study are to be discussed at the next session. In addition, this chapter also includes the research significance of this paper. Hence, the conclusion and discussion provide a clear concept and understanding of this study.

5.2 Discussion of Major Finding

5.2.1 Relationship between Locus of Control Traits and Entrepreneurial Attitude

Research Objective 1 : Investigate the Personality Traits (Locus of Control Traits) and the entrepreneurial attitude among engineering students.

Research Question 1 : Is there any relation between Personality Traits (Locus of Control Traits) and the entrepreneurial attitude among engineering students?

Hypothesis 1 (H_1) : There is a positive significant relationship between personality traits (locus of control) and entrepreneurial attitude.

Table 4.34 had summarized all the analysis and results with answers, realizing the proposal of research questions and hypotheses. The results of Locus of Control Traits (Correlation coefficient = 0.422**, $\beta = 0.386$, $p = .000 < 0.01$) indicate the Locus of Control Traits has the strongest relationship towards the Entrepreneurial Attitude. As the higher of the correlation coefficient means that, the higher the Locus of Control Traits to the engineering students, which would obtain higher Entrepreneurial Attitude. In this study, the p-value of Locus of

Control Traits was .000, less than 0.01 ($p < 0.01$), indicating a significant relationship between Locus of Control Traits and Entrepreneurial Attitude. The results of the study have answered the research question 1 and support the view of this study that alternative hypothesis 1 (H_1). Therefore, Locus of Control Traits has a strong positive effect and significantly correlated to the Entrepreneurial Attitude. This statement is supported by many previous researchers such as Rotter, J. (1966); Pandey, J. & Tewary, N.B. (1979); Muller, S.L., & Thosmas, A.S. (2001); Çolakoğlu, N., & Gözükara, İ. (2016).

According to Muller, S.L. (2001), locus of control as a trait that influences heavily to one another's entrepreneurial attitude. This is because the locus of control consists of many important individual traits such as independence, control, self-reliance and confidence, initiative, and so on. These all are often thought to be closely related to the values and attitude of entrepreneurship. For an example, if the people who possess the locus of control orientation, people will start action to do something what that they want to achieve rather than the people who do not possess the locus of control. Diaz & Rodriguez (2003) has compared with those students who with the low locus of control, those with the high locus of control are more likely to engage in entrepreneurial attitude and have a higher demand for achievement.

5.2.2 Relationship between Risk-taking Traits and Entrepreneurial Attitude

Research Objective 2 : Investigate the Personality Traits (Risk-taking Traits) and the entrepreneurial attitude among engineering students.

Research Question 2 : Is there any relation between Personality Traits (Risk-taking Traits) and the entrepreneurial attitude among engineering students?

Hypothesis 2 (H_2) : There is a positive significant relationship between personality traits (risk-taking) and entrepreneurial attitude.

Table 4.34 had summarized all the analysis and results with answers, realizing the proposal of research questions and hypotheses. The results of Risk-taking Traits (Correlation coefficient = 0.387**, $\beta = 0.219$, $p = .000 < 0.01$) indicate the Risk-taking Traits has strong relationship towards the Entrepreneurial

Attitude. The correlation coefficient is just slightly lower than the Locus of Control Traits. Therefore, the Risk-taking Traits are still much more influences the engineering students towards Entrepreneurial Attitude. In this study, the p-value of Risk-taking Traits was .000, less than 0.01 ($p < 0.01$), indicating a significant relationship between Risk-taking Traits and Entrepreneurial Attitude. The results of the study have answered the research question 2 and support the view of this study that alternative hypothesis 2 (H2). The results and relationship are supported by several researchers such as Brockhaus (1980); Lee & Wong (2003); Norton & Moore (2006); Chen & Lai (2010); Çolakoğlu, N., & Gözükara, İ. (2016); Do, B.-R., & Dadvari, A. (2017).

According to the research of Chen & Lai (2010), the characteristics of risk-taking are identified to be a part of personality traits, and the risk-taking trait is one of the key components of entrepreneurial attitude. This is because the more entrepreneurs tolerate risk and independence, the more likely they are to start a business. (Lee & Wong, 2003) Other than that, the risk-taking trait is more influences to the engineering students and assisting in building up their entrepreneurial attitude and career. This is because the engineering students are still young and may more willing to put their hands in challenging and risky activities because they don't have much to lose and they can learn lessons well as experience if they dun succeed. Hence, this is the first step in getting young people, especially engineering students, to try and become entrepreneurs.

5.2.3 Relationship between Need for Achievement and Entrepreneurial Attitude

Research Objective 3 : Investigate the Personality Traits (Need for Achievement Traits) and the entrepreneurial attitude among engineering students.

Research Question 3 : Is there any relation between Personality Traits (Need for Achievement Traits) and the entrepreneurial attitude among engineering students?

Hypothesis 3 (H_3) : There is a positive significant relationship between personality traits (Need for Achievement) and entrepreneurial attitude.

Table 4.34 had summarized all the analysis and results with answers, realizing the proposal of research questions and hypotheses. The results of Need for Achievement Traits (Correlation coefficient = 0.319**, β = 0.286, p = .000 < 0.01) indicate the Need for Achievement Traits has the weakest relationship in three of the independent variables towards the Entrepreneurial Attitude. Therefore, the Need for Achievement Traits as a part that influences the engineering students towards Entrepreneurial Attitude. In this study, the p-value of Need for Achievement Traits was .000, less than 0.01 ($p < 0.01$), indicating a significant relationship between Need for Achievement Traits and Entrepreneurial Attitude. The results of the study have answered the research question 3 and support the view of this study that alternative hypothesis 3 (H3). The relationship is supported by several researchers such as Kristiansen & Nurul (2004); Zeffane, R. (2013); Nurdan & Izlem (2016).

As Nurdan & Izlem (2016) stated, the need for achievement is the behavioural tendencies that enable individuals to perform specific activities. The stronger the need for achievement on an individual, the better one performs on a task or challenge. Therefore, the need for achievement played as an important role in personality factors that can directly affect the entrepreneurial attitude. This is because entrepreneurs required high a need for achievement so that they can drive the individual step into the entrepreneur field and achieved road to success. Other than the need for achievement, entrepreneurship also required emotional, knowledge and energy. Hence, engineering students will be a much higher chance to become an entrepreneur because engineering is a course that complicated and required high knowledge and energy to study. Therefore, engineering students are more get closer to being an entrepreneur compare with other courses students.

5.2.4 Differences between Public and Private Higher Education Institutions among Personality Factors and Entrepreneurial on Engineering Students

Research Objective 4 : Investigate the differences between the Personality Traits and Entrepreneurial Attitudes of Engineering Students in Public and Private Higher Education Institutions.

Research Question 4 : Are there differences between the Personality Traits and Entrepreneurial Attitudes of Engineering Students in Public and Private Higher Education Institutions?

Hypothesis 4 (H_4) : There exist differences between the Personality Traits and Entrepreneurial Attitudes of Engineering Students in Public and Private Higher Education Institutions.

Table 4.34 had summarized all the analysis and results with answers, realizing the proposal of research questions and hypotheses. The results of both types of Higher Education Institution have obtained a significant value, $p < 0.05$, which indicate that the results are very consistent and accurate. Other than that, Table 4.31 has shown that most of the engineering students in Public University are more towards Need for Achievement Traits while the engineering students in Private University are more towards Locus of Control Traits. Thus, as the results above already showing, there are existing differences between the Personality Traits and Entrepreneurial Attitudes of Engineering Students in Public and Private Higher Education Institutions. This statement also supported by many previous researchers such as Luthje & Franke, 2003; Ozen Kutanis et al., 2006; Schwarz et al., 2009.

Luthje & Franke (2003) state that environmental factors will be one of the important issues that influence people decision and characteristic. Therefore, a different type of university constitutes a different type of environments for study, activities, and so on. For example, if the surrounding environment is a cybercafé or club, then a long time of entertainment will produce temptation to people, and then indirectly affect a person's personality. If the surrounding environment is full of positive, motivated activities or learning, then the person will be affected and set a positive goal to achieve. Even though both types of universities serve as a study or learning environments, there are still different characteristics in the cultivation of engineering student's personality.

5.3 Conclusion

The purpose of this study is to better understand this research topic. After this study, people have a better understanding of the entrepreneurial of engineering

students in public and private higher education by studying locus of control, risk-taking, need for achievement and entrepreneurial attitude. This chapter summarizes the main findings and supports the hypotheses made. Three of the research questions which related to three independent variables also answered clearly as well.

From the results that show in this study, locus of control traits is the most important independent variable for engineering students on private or public higher education institutions towards entrepreneurial attitude. Locus of control traits shows the strongest positive significant relationship with entrepreneurial attitude in this study. Hence, locus of control as the main key that makes the young generation to develop their entrepreneurial attitude in future. This is because the entrepreneurship is made up of many complex elements—the locus of control as the main element that controls the personality of an individual. Therefore, an individual with the strong locus of control will guide themselves to success in entrepreneurship, because they can control themselves, and they believe that tasks or work can be completed by perfect or good performance. Other than that, only one of the personality factors is not enough to assist engineering student to build up their entrepreneurial attitude. Therefore, risk-taking traits will help to engineer students to approach to business or entrepreneur field. As previous researchers stated, the people who are willing to take risks would reach higher goals than the other who afraid to try (Ekelund et al.,2005). This trait can influence a person's decision to become an entrepreneur indirectly. Although the need for achievement trait had the lowest positive relationship in this study, it still had an impact on whether engineering students were interested in starting a business. Need for achievement trait will define an individual aspire about the important success, excel in abilities and reaching the targets (Sari et al., 2018).

These behaviors will lead an individual to set an ambition or targets and brings them to concentrate on it. Therefore, the need for achievement of personality factors also acts as crucial parts in an entrepreneurial attitude.

According to Gurbuz & Aykol (2008), entrepreneurship can solve the unemployment problem in Malaysia while solving the problem that the Malaysian economy will become stable. Hence, higher education institutions

must strive to encourage engineering students in higher education institutions to engage in entrepreneurship-related activities to educated, plan and curriculum. Engineering students also need to understand that social environment or issues that may affect their entrepreneurial attitude in the future. The conclusion drawn from this study is expected to be some reference to become entrepreneurship, especially the literature set in Malaysia.

In conclusion, this study is helpful for engineering students to further understand the personality factors on an individual to influence their entrepreneurial attitude.

5.4 Recommendation

This study makes numerous recommendations to ensure that future researcher to develop or improve the results in an easier way. Further research related to this topic can refer to the recommendations of this study to avoid similar limitations once.

In this study, the target respondents mainly focused on engineering students in public or private education institutions to investigate their personality factors towards entrepreneurial attitude. Hence, for further research, future research could expand to other population rather than engineering students on public and private higher education institution. For example, the future researcher can expand the target population to graduated and practice engineers because they have a different perception of the entrepreneurial attitude when they come to their working fields.

Other than that, there are still able to expand the target population, which target each ethnic in public or private education institutions to investigate their personality factors towards entrepreneurial attitude—for example, preparing three sets of data which one set of data are filled by Malay, one set by Chinese and one set by Indian. Therefore, this can assist in the investigation of the culture and differences between each of the ethnic in personality factors towards entrepreneurial attitude.

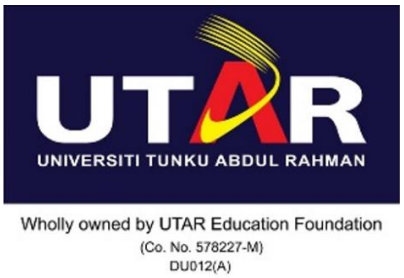
The data collections are using questionnaire survey in this study. Thus, can try to use some mixing method such as implemented interview session as one type of data collection method in order to get more accurate results. This is

because the engineering students were easier to described their perception of personality factor and entrepreneurial attitude. It also helps to avoid any misunderstandings about the questions during the interview process.

Last but not least, locus of control and risk-taking traits are the two independent variables which getting a higher positive relationship to the entrepreneurial attitude in this study. In order to support the locus of control trait and risk-taking trait as important variables that affect the entrepreneurial attitude of engineering students, future research can be added to further understanding of locus of control and risk-taking traits. For example, investigate the internal or external of locus of control trait that the most influences the engineering students in entrepreneurial attitude. This can improve the research details and make a clearer insight into future research.

APPENDICES

Appendix A : RESEARCH QUESTIONNAIRE



UNIVERSITI TUNKU ABDUL RAHMAN (UTAR)

FACULTY OF ENGINEERING AND SCIENCE

Bachelor of Civil Engineering (Hons)

Dear respondent,

We are undergraduate students of Bachelor of Civil Engineering (Hons) at Universiti Tunku Abdul Rahman (UTAR) and three of us are currently conducting a combined research which is entitled "A Study on a Model of Entrepreneurial Attitude among Engineering Students on Local and Private Higher Education Institution".

This research study is a compulsory subject to partially fulfill the requirement of our degree program. This questionnaire is carefully designed to be completed in no more than 15 minutes. The attached questionnaire will be consisted of a series of sections which are entrepreneurial attitude, personality factors, cognitive factors and motivational factors.

We would appreciate if you would spend some of your time to complete the enclosed questionnaire based on your own knowledge and understanding. Your cooperation is highly appreciated and thank you for spending your precious time to fill in our questionnaire.

Lastly, your responses will be kept strictly **PRIVATE AND CONFIDENTIAL** as they will and only be used solely in our research purpose.

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Section A: Demographic Information

INSTRUCTION: This particular section is related to the characteristics of the target respondents. Place a "✓" in the box of your answer.

1) What is your gender?

□ Male

□ Female

2) Which ethnic group do you belong to?

□ Chinese

□ Malay

□ Indian

□ Other (please specify): _____

3) What is your year of acedemic study in higher education institution?

□ Year 1

□ Year 2

□ Year 3

□ Year 4

□ Others (please specify):_____

4) Are you an engineering student?

□ Yes

□ No

5) Which higher education institution are you from?

□ Universiti Tunku Abdul Rahman (UTAR)

□ Tunku Abdul Rahman University College (TARUC)

□ Sunway Universities (SUNWAY)

□ University of Malaya (UM)

□ University Science Malaysia (USM)

□ Universities Putra Malaysia (UPM)

□ Others (please specify):_____

Section B & C:

INSTRUCTION: Please follow the instruction and answer these questions carefully. Please indicate your level of agreement with each of the statement by circling the number that reflects your opinion most accurately.

Strongly Disagree (SD)	Disagree (D)	Neutral (N)	Agree (A)	Strongly Agree (SA)
1	2	3	4	5

B. Entrepreneurial Attitude

Personal attitudes lead to undertake a business or an enterprise.

No.		SD	D	N	A	SA
1.	Being an entrepreneur implies more advantages to me.	1	2	3	4	5
2.	Starting a business is an attractive idea to me.	1	2	3	4	5
3.	If I had the opportunity and resources, I'd like to become self-employment.	1	2	3	4	5
4.	Being an entrepreneur would entail great satisfactions for me.	1	2	3	4	5
5.	Among various options, I would rather be an entrepreneur.	1	2	3	4	5

Source: Adapted from Francisco Linan and Yi-Wen Chen,2009. *Development and Cross-Cultural Application of a Specific Instrument to Measure Entrepreneurial Intentions.*

C. Personalities Factors

Locus of Control Traits

The power of control that have influenced on an individual mindset, perceptions and actions.

No.		SD	D	N	A	SA
1.	My experiences in life is determine by my own actions.	1	2	3	4	5
2.	It's always better for me to take action rather than to believe in fate.	1	2	3	4	5
3.	My success is depending my hard work, luck has nothing to do with it.	1	2	3	4	5
4.	My success depends on being in the right time and the right place.	1	2	3	4	5
5.	When I make plans, I am almost certain that I can make them work.	1	2	3	4	5
6.	How your accomplishments depend how you are.	1	2	3	4	5
7.	I feel I can control of my life.	1	2	3	4	5
8.	Becoming a success is a matter of hard work, luck has little or nothing to do with it.	1	2	3	4	5

Source: Adapted from Julian B. Rotter, 1966. *Generalized Expectancies for Internal Versus External Control of Reinforcement.*

Risk-taking Traits

The power of uncertainty that have influenced on an individual mindset, perceptions and actions.

No.		SD	D	N	A	SA
1.	I am not willing to take risks when starting a new business.	1	2	3	4	5
2.	I prefer a low risk/ high security in business with predictable profit over a high risk and high profit.	1	2	3	4	5
3.	I prefer to remain in a business field that has problems that I know about rather than to take the risks of a new business field that has unknown problems, even if the new business field offers greater rewards	1	2	3	4	5
4.	I view business related risk as a situation to be avoided at all costs.	1	2	3	4	5

Source: Adapt from William I. Norton Jr and William T. Moore. *The Influence of Entrepreneurial Risk Assessment on Venture Launch or Growth Decision.*

Need for Achievement Traits

The power of goals that have influenced on an individual mindset, perceptions and actions.

No.		SD	D	N	A	SA
1.	I will do very well in fairly difficult tasks relating to my study and my work.	1	2	3	4	5
2.	I will try hard to improve on past work performance.	1	2	3	4	5
3.	I will seek added responsibilities in jobs assigned to me.	1	2	3	4	5
4.	I will try to perform better than my friends.	1	2	3	4	5

Source: Adopt from Stein Kristiansen & Nurul Indarti, 2004. *Entrepreneurial Intention Among Indonesian and Norwegian Students.*

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