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A Study of Entrepreneurial Characteristics and Entrepreneurial Intention among Electrical and Electronic Engineering Students

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Abstract: Entrepreneurship is flourishing all over the world. It promotes economic growth and development of a country. This is important for job creation, innovation and growth. Therefore, it is the engine that drives the national economy. The problem of unemployment among college graduates is of great concern to policy makers and academics. The first objective of this study was to determine the level of entrepreneurial characteristics of electrical and electronic engineering students. The second objective was to determine the level of entrepreneurial intention among electrical and electronic engineering students. The third objective of the study was to determine the relationship between entrepreneurial characteristics and entrepreneurial intention among electrical and electronic engineering students at UTHM. The scope of this study is limited to the electrical and electronic engineering students at UTHM. This study uses the quantitative research method of questionnaire to collect data, and the data sources include primary and secondary data. To analyze the collected data, this study uses descriptive analysis and correlation analysis. The main finding of this study is that entrepreneurial characteristics have a significant positive relationship with entrepreneurial intention. The scope of this study is limited, so it is suggested for future research to expand the scope of the study.

Keywords: Entrepreneur, Entrepreneurial Intention, Entrepreneurial Characteristics

1. Introduction

Entrepreneurship is a valuable and priceless resource that plays an important role in all human societies. It can be not only a source of creativity, but also an inexhaustible resource. Entrepreneurship is considered an important component of modern economic power. An entrepreneur is a self-employed person. He started to organize, manage and take responsibility for the business. He faced many personal challenges instead of being an employee of others. This is a personal challenge (Gary Segal *et al.*, 2005).

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Entrepreneurs are people who start new businesses in the face of risk and uncertainty. Their goal is to find opportunities and combine the resources necessary to exploit and deploy the discovered opportunities for profit and growth. (Scarborough, 2012). The characteristics of entrepreneurs fall into five main categories: personal characteristics, motivation, demographic factors, lifestyle behaviors, and skill distribution (Pourrajab and Mohammadi, 2011).

The purpose of this paper is to examine the relationship between entrepreneurial characteristics and entrepreneurial intentions in electrical and electronic engineering students. In this study, entrepreneurship is effectively introduced. Then, the problem of unemployment, the problem statement, the research question, the research objective, the research scope, and the significance of the research are discussed.

Entrepreneurship is flourishing all over the world. It promotes economic growth and development of a country. This is important for job creation, innovation and growth. It is therefore the engine that drives the national economy. The profile of an entrepreneur includes a desire for responsibility, a preference for moderate risk, confidence in personal success, a desire for immediate feedback, a high level of energy and future orientation, organizational skills, and for entrepreneurs, money is a way to keep track of things, but not as important as performance. The main objective of this study was to identify the entrepreneurial characteristics and entrepreneurial intentions among electrical and electronic engineering students. The cognition of entrepreneurship originates from personal motivation and is understood as the igniting factor that makes the behavior explode and gain energy to support it and lead it to the goal (Haynie *et al.*, 2010). Entrepreneurs are the bearers of risks caused by changes in market demand (Cantillon, 1755). The functions of entrepreneurship mainly include risk measurement and risk taking within the business organization (Palmer, 1971). Entrepreneurship is the process of giving birth to a new organization (Gartner, 1989). Unemployment is not only a problem in Malaysia but also in the world (Zaliza Hanapi *et al.*, 2014).

The problem of unemployment among college graduates is of great concern to politicians and academics. These graduates can start their own businesses to overcome this problem. While many college graduates have the knowledge and skills needed to start their own businesses, only a very small number of students choose to become self-employed immediately after graduation (Ministry of Higher Education, 2010). This may be due to a lack of confidence or a lack of encouragement or security (Islam *et al.*, 2020). During this Covid 19 pandemic, the unemployment rate has increased significantly (Blustein *et al.*, 2020). Therefore, this study aims to identify the entrepreneurial characteristics and entrepreneurial intentions of electrical and electronic engineering students.

Therefore, to achieve the research objectives the level of entrepreneurial characteristics among electrical and electronic engineering students are determined. Furthermore, the level of entrepreneurial intention among electrical and electronic engineering students also determined. Consequently, the relationship between entrepreneurial characteristics and entrepreneurial intention among the electrical and electronic engineering students in UTHM is identified.

The scope of this study is limited to electrical and electronic engineering students at UTHM. There are two main reasons for the selection of engineering students. First, because there is a major shortage of engineers worldwide, and second, because studying their attitudes and behaviors is particularly important in a knowledge-based economy. Each participant in the study will be asked to complete a short questionnaire to complete this research.

The contribution of young Malaysians to entrepreneurship will boost the country's economic growth and can help Malaysia become a developed country by 2020. They are the people who can help the country evolve into a more advanced and prosperous economy. Unfortunately, self-employment is not their main career choice (Rajendran, 2011).

Therefore, this research is of great importance to the future career path of college students. By identifying their strengths, weaknesses, and intentions, it provides better opportunities for their career development. They are able to determine their personal characteristics, attitudes, and self-efficacy, which helps to clarify their intentions regarding self-employment.

This research is also very important for implementing strategies for the future development of plans for entrepreneurship among students. By having a good understanding of the factors that influence students' entrepreneurial intentions, all the plans that the government provides for them will be fully utilized. This research will provide Malaysian policy makers with insights into the state of entrepreneurship education to stimulate entrepreneurial intentions and thereby increase the rate of new entrepreneurial venture capital. The in-depth study of entrepreneurial intentions will provide practical information as policy makers can make better and more informed decisions in designing entrepreneurship course structures, which will help increase student participation in business in the future (Ooi, 2008).

Finally, the public learns about its role in promoting college students' intentions and providing social support. Family background influences an individual's willingness to become an entrepreneur (Kolvereid, 1996). Entrepreneurial parents can provide college students with prior business knowledge and experience to increase their confidence in self-employment. In short, if there are more entrepreneurs in the country, the unemployed can be hired by these entrepreneurs, reducing the unemployment rate. This benefits the general public by improving the quality of life and standards.

2. Literature Review

The literature review discusses the relevant concepts and theories of entrepreneurial characteristics and entrepreneurial intentions. The purpose of the literature review is to present previous work on this topic in order to articulate the goals and theoretical framework of current research.

2.1 Entrepreneurship

Entrepreneurship is the process by which individuals seek opportunities regardless of the resources they currently control (Stevenson & Jarrilo, 2010). Entrepreneurship is an international activity, and there is a strong relationship between business creation and intention (Henley, 2007). The term entrepreneurship is derived from the French word "entrepreneur." Entrepreneurs are also referred to as self-employed people. There is no fixed definition for the term "entrepreneur" as it is understood and defined differently in different research fields. Economists define entrepreneurs as those who combine resources to make them valuable. For psychologists, entrepreneurs are usually driven by certain forces, such as the need to obtain or get something, to conduct experiments, and to achieve goals. For entrepreneurs, entrepreneurs can be threats and active competitors, but they can also be allies, sources of supply, customers, or people who create wealth for others and find better ways to use resources, reduce waste, and create jobs (Hisrich, Peters & Shepherd, 2005).

Becoming a successful entrepreneur is not easy. It requires long-term, systematic planning and business expertise, such as developing business models, building new venture teams, raising funds, building partnerships, managing finances, and leading and motivating employees. Therefore, it is important to determine a person's entrepreneurial intentions before becoming an entrepreneur. This can give a person a clear goal of what kind of person they want to be and what they need to do to achieve their goals and be successful.

2.2 Entrepreneurial Characteristics

Research on entrepreneurship typically focuses on the differences in personality traits between successful entrepreneurs and non-entrepreneurs (Armstrong and Hird, 2009). These characteristics

include attitudes toward risk, innovation, enthusiasm, sense of accomplishment, internal sources of control, and self-efficacy. As a result, many different methods and models have been used to measure the relative entrepreneurial nature of individuals and/or organizations. This study focuses on three characteristics, namely behavioral control, subjective norm, and attitude toward self-employment. Entrepreneurial traits refer to individual factors, and the well-known trait models consider the personality traits of entrepreneurs (Koh, 1996). The model is based on the assumption that entrepreneurs have certain unique traits, values, and attitudes that distinguish them from others (Koh, 1996).

(a) Perceived behavioral control

Attitudes are developed from behavioral beliefs. Assume that people with higher attitudes toward a behavior are more likely to adopt controlled behaviors (Ajzen, 2002). Behavioral control influences individuals' intention to act based on their perception of the difficulty of performing a particular behavior (Ajzen, 1991). In addition, there are some internal and external factors that encourage or discourage individuals, such as the view of friends or previous owners or the availability of resources or the experiences of close people and others. Perceived behavioral control (PBC) is a person's perceived ability to become an entrepreneur (Kolvereid, 1996).

(b) Attitude

Attitude is the tendency to react positively or negatively to things, people, institutions, or moments (Ajzen, 2005). Attitude is the way a person evaluates and compares objects and available options based on his or her thoughts (cognition), beliefs (values), and emotions of the object (Hoyer and Maclnis, 2004). In this study, entrepreneurial attitude is defined as a tendency to respond positively or negatively to entrepreneurship. Studies have found that attitudes and behavioral intentions are positively correlated (Crisp & Turner, 2007). Attitudes toward behavior lead to intentions and eventually to actual behaviors (Ajzen, 1991). In the context of entrepreneurship, attitude toward self-employment is defined as "the difference between a person's desire to become self-employed and the desire to organize employment" (Souitaris, Zerbinati, & Al-Laham, 2007, p. 570). Attitude toward entrepreneurship is the extent to which a person has a positive or negative personal evaluation of entrepreneurship (Liñán and Chen, 2009).

2.3 Entrepreneurial Intention

People are active promoters of their own development (Brandtstaedter & Lerner, 1999). They do not start their businesses by chance, but consciously and of their own free will (Krueger, 2007). The employment status selection model, which focuses on entrepreneurial intention, has always been a topic of great interest in entrepreneurship research (Kolvereid, 1996b). According to Bird (1988), entrepreneurial intention is a conscious mental state that directs personal attention, experience, and behavior toward a planned entrepreneurial behavior. Entrepreneurship provides opportunities for college graduates to become self-employed. It reduces social ills, and policy makers value college students engaging in entrepreneurship to increase employment rates (Branchet *et al.*, 2011). This makes researching the phenomenon of entrepreneurship very attractive, especially in terms of how to get college students to learn entrepreneurship. They found that attitudes toward behavior, subjective norms, and perceived behavioral control significantly increase the likelihood that students will indicate entrepreneurial intentions (Engle *et al.*, 2010).

2.4 Entrepreneurial Characteristics an Entrepreneurial Intention

Research is conducted on what motivates people to become entrepreneurs and start new businesses (Hazzouri *et al.*, 2014). The author further states that any model based on entrepreneurial goals is the best approach for predicting entrepreneurial activities. This is because, in their opinion, entrepreneurship refers to a mindset that focuses on opportunities rather than threats, and the process of identifying opportunities is obviously an intentional process, so they provide a better explanation and

prediction of the entrepreneurial antecedent method, or in other words, entrepreneurship (SM Kabir, 2017).

In a study by Hazzouri *et al.* (2014), entrepreneurial attitude is used to determine the intention to engage in entrepreneurial activities. Kolvereid and Tkachev (1999); Dohse and Walter (2009); Paço, Ferreira, Raposo, Rodrigues, and Dinis (2011) found that attitude towards a behavior has a direct positive influence on entrepreneurial intentions. According to Scholten *et al.* (2004), the results show that attitude has a great influence on intention, in fact, attitude is the crucial variable of intention; any change in attitude directly leads to a change in entrepreneurial intention to the same extent

The influence of subjective norms on entrepreneurial intention was found to be weak, but when it comes to entrepreneurial intention, perceived behavioral control quickly became a more important factor (Autio *et al.*, 2013). Kolvereid (1996b); Basu and Velik (2008); Ruhle *et al.* (2010) claimed that there is a significant relationship between perceived behavioral control and intention. Ruhle *et al.* (2010) further state that self-assessment of perceived behavioral control has a large impact on students' intentions, as the level of support for perceived feasibility can increase entrepreneurial intentions.

Kolveried and Isaksen (2006) examined the subjective norms of founders of Norwegian companies and found that subjective norms were significantly related to entrepreneurial intentions. Yordanova and Tarrazon (2010) found that the more subjective norms support entrepreneurial behavior, the stronger the intention to start a business.

Based on the above discussion, hypotheses can be formed:

Hypothesis 1: perceived behavioral control

H0: There is no significant relationship between perceived behavioral control and entrepreneurial intention

H1: There is significant relationship between perceived behavioral control and entrepreneurial intention

Hypothesis 2: Subjective norm

H0: There is no significant relationship between subjective norm and entrepreneurial intention

H1: There is significant relationship between subjective norm and entrepreneurial intention

Hypothesis 3: Attitude

H0: There is no significant relationship between attitude and entrepreneurial intention

H1: There is significant relationship between attitude and entrepreneurial intention

3. Research Methodology

For a detailed description of the methodology used in the analysis, see Research Methodology. This section describes the sampling techniques and methods, data collection, processing, and analysis, and the domain in which the research is conducted. Research methodology also highlights the limitations and problems encountered in data collection. The concept of research design, sampling plan to determine the sample size, and data analysis method for the research are explained in detail. The methodology involves the process of preparing a thoroughly organized study to collect and analyze data according to the required suitability. It is a tool used to support and ensure the accuracy, correctness,

and precision of the research results (Hin, 2007). Research methodology explains the types of survey methods used to answer research questions. In this section, the development of the questionnaire design was discussed in detail. Finally, at the end of this part, the methods of collecting survey data and the types of statistical tools used for data analysis are discussed. The issues discussed in the research methodology are critical in determining the methods and strategies used to conduct this research. The details discussed in this study are research design, research framework, research population, research samples, data collection, and data analysis.

3.1 Research Design

The research design provides guidance for the research by giving basic instructions for conducting the research, designing the instruments, conducting the fieldwork, collecting data, and analyzing the data. (Samuel *et al.*, 2007). Descriptive design is used in the study to describe a population in terms of the significant variables or characteristics or data studied, such as the study of frequency, mean, and other statistics.

There are different approaches of research methods that can be used in research. Qualitative research, quantitative research, and a combination of qualitative and quantitative research are the methods.

To answer the questions of the study, a quantitative research approach is used in this study. Quantitative methods are most appropriate when the goal of inquiry is to gain deep insight into the phenomenon (Ghauri, Groenhaug & R Strange 2020, 98). Quantitative research involves the process of objectively collecting and analyzing numerical data to describe, predict, or control the variable of interest. The goal of quantitative research is to test the causal relationship between variables, make predictions, and extend findings to a broader population (Saul Mcleod, 2019). Quantitative researchers aim to establish general laws of behavior and phenomena in different contexts/environments (Mcleod, 2019). Research is used to test theory and ultimately support or reject it (Mcleod, 2019).

3.2 Data Collection

The data used for the study includes primary data and secondary data. To collect primary data, the questionnaire is considered as the research instrument used in this study. Primary data is the data collected for the current specific research question using a program appropriate for the research question (Hox & Boeije, 2005). Secondary data is information collected by others and available to researchers (Clark, 2005).

(a) Primary data

The primary data is the original data obtained by the researcher. The primary data in this study is obtained using the survey method, which is a method of collecting information by asking a series of questions to a sample selected from the population being studied. In this study, the survey method was conducted using primary data in the form of questionnaires distributed to respondents. The questionnaire was distributed through email and social media (such as WhatsApp, Telegram or Facebook). In this study, the created questionnaire is used for data collection (Appendix B).

(b) Secondary data

Secondary data are data collected by other researchers. In addition to the primary data obtained through the questionnaire survey described above, other information is needed to further strengthen the research. These data are the most important source of information because they are needed to clarify the title of the research and to obtain the facts and results of previous researches. The source of secondary data is research journals and manuals which are manually obtained from Tunku Tun Aminah Library, Tun Hussein Onn College, Malaysia. In addition, online resources such as Emerald, Science Direct, Research Gate, Google Scholar, Mendeley, etc. are also used as references. The purpose of

secondary data is to identify problems, develop methods to solve them, and answer some questions. Secondary data is supporting data to understand the more detailed research. Supporting data that can be used include reliability of the data, sustainability of the data, and adequacy of the data.

3.3 Data Analysis

Data review was conducted to determine the results of the study and whether the research would achieve the research objectives. The descriptive analysis approach and correlation analysis are used to evaluate the data obtained from the primary data of the questionnaire.

(a) Descriptive analysis

Descriptive analysis is used to look at percentages, averages, and frequencies (Flynn, 2011). Percentages, averages, and frequencies are used to address research objective 1 and research objective 2, which is to determine the extent of entrepreneurial characteristics and the extent of entrepreneurial intentions among electrical and electronic engineering students. In this study, the researchers would use descriptive analysis to explain how to obtain the data from the survey. The SPSS program is the statistical analysis tool that will be used to analyze the data for this report. In addition, the analysis will show the percentage and mean for the research on the basic results and data information. Descriptive analysis is used to study the characteristics of each variable. Thus, the researcher examined the data to describe the mean and standard deviation for all variables, i.e., perceived behavioral control, subjective norm and attitude toward self-employment, and entrepreneurial intention. Moreover, this analysis is an efficient way to differentiate each part of the mean distribution based on the Likert scale to measure the level of all independent variables and dependent variables. This analysis is used to analyze the demographic data of the respondents, such as gender or age. Descriptive analysis used to examine the demographic frequency or percentage of respondents in this study. Descriptive analysis is also used to analyze the average value for each variable.

(b) Correlation analysis

Correlation analysis is used to determine the relationship between variables (Akhilesh, 2019). In this study, the researcher will use correlation analysis to know how to measure the extent of agreement between variables. Spearman's correlation coefficient method is used to express the strength of the relationship between variables when the normality test shows that the data are not normally distributed (Patrick *et al.*, 2018).

The purpose of this analysis is to achieve the first objective, which is to determine the relationship between the entrepreneurial characteristics of electrical and electronic engineering students and their entrepreneurial intentions. The Spearman or Pearson correlation coefficient is a value between -1 and +1. A value of +0.1 means that the variables are linearly related, i.e., have an increasing relationship; a value of -1 means that the variables are linearly related, i.e., have a decreasing relationship; and a value of zero means that there is no linear relationship between the variables. If the correlation coefficient is greater than 0.8, there is a strong correlation, but if the correlation coefficient is less than 0.5, there is a weak correlation.

Table 1: Rule of thumb about correlation coefficient size (Hair *et al.*, 2007)

Coefficient Range	Strength of Association
0.91 – 1.00	Very Strong
0.71 – 0.90	High
0.41 – 0.70	Moderate

0.21 – 0.40	Small but definite relationship
0.10 – 0.20	Slight, almost negligible

(c) Pilot test

Pilot testing refers to preliminary testing of research surveys in which a small number of respondents are interviewed to identify unforeseen problems, such as in the flow and wording of questions. According to Connelly (2008), the existing literature indicates that the pilot study sample should be 10% of the expected sample of the larger parent study. However, Isaac and Michael (1995) and Hill (1998) recommend 10 to 30 participants for pilot test participation. Therefore, a pilot test with 30 samples was conducted to improve the reliability and effectiveness of the problem and to identify weaknesses in the problem design prior to the actual study.

(d) Normality analysis

Normality analysis is required before proceeding to the next test, correlation analysis. According to Asghar and Saleh (2006), the normality test is used to determine if the study population is normally distributed. If the data is normally distributed, a parametric test is performed by conducting the Pearson correlation test. However, if the data are not normally distributed, a non-parametric test is performed using the Spearman correlation test. Also, the researcher must apply the Kolmogrov-Smirnov test to determine the normal distribution of the data.

(e) Reliability test

Cronbach's alpha reliability test was used to determine the internal consistency approach for each item of the scale in the instrument of the study. The results of the questionnaire were analyzed using SPSS. According to Bonett and Wright (2014), the Cronbach's alpha value should be greater than 0.7 to be acceptable for research.

Table 2: Rule of thumb for Cronbach's alpha coefficient value (Zikmund *et al.*, 2010)

Alpha Coefficient Range	Strength of Association
<0.60	Poor
0.60 to <0.70	Moderate
0.70 to <0.80	Good
0.80 to <0.90	Very Good
>0.90	Excellent

4 Discussions

The results and discussion section presents data and analysis of the study.

4.1 Results

This section is discuss the result of the findings.

(a) Return rate

Table 3: Return rate

Population	Sample size	Questionnaires Distributed	Return Questionnaires	Percentage (%)
1719	313	313	313	100

(b) Reliability test

Table 4: Reliability test

Variable	Cronbach's Alpha	N-Items in Scale	N-Respondents
Entrepreneurial Characteristics	0.949	21	313
Entrepreneurial Intention	0.969	9	313
Overall	0.973	30	313

Table 4 shows the current reliability test of this study. The Cronbach's alpha value for entrepreneurial traits is 0.949 and the Cronbach's alpha value for entrepreneurial intention is 0.969, reflecting acceptable reliability. The overall Cronbach's alpha value is 0.973, which means that the reliability is very good.

(c) Demographic background

Table 5: Demographic background

Gender	Frequency	Percentage (%)
Male	217	69.3
Female	96	30.7
Total	313	100.0
Age	Frequency	Percentage (%)
19-21 years old	67	21.4
22-23 years old	203	64.9
24-27 years old	43	13.7
Total	313	100.0
Race	Frequency	Percentage (%)
Malay	167	53.4
Chinese	122	39.0

Indian	20	6.4
Others	4	1.3
Total	313	100.0

Programme	Frequency	Percentage (%)
Bachelor of Electrical Engineering (BEV)	212	67.7
Bachelor of Electronic Engineering (BEJ)	101	32.3
Total	313	100.0

(d) Descriptive analysis

Appendix B shows that the highest mean score for perceived behavioral control is 3.9617, indicating that respondents want to improve their status. The lowest mean for perceived behavioral control is the desire to be a boss, and the mean is 2.2907. Overall, the mean of perceived behavioral control is 3.4486 and the standard deviation is 1.3080, reflecting a medium level.

In Appendix C, the question refers to subjective norms. The highest mean value of 3.9169 means that the respondents want to invest their personal savings, and the lowest mean value is that they want to start a business because they want to use the skills acquired in college, and the mean value is 2.3099. Overall, the mean value of subjective norm is 2.9425 and the standard deviation is 1.3554, which reflects the medium level.

The highest mean of respondents' attitude (Appendix D) is 3.0383, indicating that respondents are willing to offer a job. The desire to offer a secure job has the lowest mean of attitude with a mean of 2.8211. The mean of attitude is 2.9604, with a standard deviation of 1.4355, indicating a medium level.

Appendix E shows that the mean of entrepreneurial intention is the highest at 3.1502, indicating that respondents are willing to do anything to become entrepreneurs. The lowest mean value of entrepreneurial intention is 2.5751, indicating that they would rather be entrepreneurs than employees. The average mean of entrepreneurial intention is 2.8342, with a standard deviation of 1.4086, indicating a modest level.

(e) Normality test

Table 6: Normality test

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Perceived Behavioral Control	.125	313	.000	.944	313	.000
Subjective Norm	.178	313	.000	.909	313	.000
Attitude	.229	313	.000	.854	313	.000

Entrepreneurial Intention	.251	313	.000	.826	313	.000

Table 6 shows the Kolmogorov-Smirnov and Shapiro-Wilk significance levels for each item. The results show that the variables on entrepreneurial attributes (perceived behavioral control, subjective norms, attitude) and entrepreneurial intention have significant values $p < 0.05$ ($0.000 < 0.05$), which means that the data are not normal. As a result, the researchers need to use Spearman's rho correlation test for the independent and dependent variables to achieve the research objectives. Since the data are not normal, non-parametric tests are used.

(f) Correlation analysis

Table 7: Correlation analysis between perceived organizational support and innovative work behavior

	Spearman's rho Entrepreneurial Intention (DV)	
Variables (Entrepreneurial Characteristics)	Correlation Coefficient	Significant value
Perceived Behavioural Control	.814	.000
Subjective norm	.896	.000
Attitude	.930	.000

Table 7 shows that the Spearman correlation coefficient between behavioral control and entrepreneurial intention is 0.814 and statistically significant (P = 0.000). In addition, the Spearman correlation coefficient between subjective norm and entrepreneurial intention is 0.896 and is statistically significant (P = 0.000), and the Spearman correlation between attitude and entrepreneurial intention is 0.930 and is also statistically significant (P = 0.000).

There was a high positive correlation between perceived behavioral control and entrepreneurial intention, which was statistically significant (correlation coefficient = 0.814, P = 0.000). In addition, there was a high positive correlation between subjective norm and entrepreneurial intention that was statistically significant (correlation coefficient = 0.896, P = 0.000), and there was a very high positive correlation between attitude and entrepreneurial intention that was statistically significant (correlation coefficient = 0.930, P = 0.000).

4.2 Discussions

a) Research objective 1: To identify the level of entrepreneurial characteristics among electrical and electronic engineering students

The mean value of the variable Perceived Behavioral Control is 3.4486, which means that the level of perceived behavioral control is moderate. The mean of the Subjective Norm variable is 2.9425, which also reflects a moderate level. The level of the Attitude variable is moderate, with a mean of 2.9604. Therefore, the overall entrepreneurial characteristics reflect the moderate level of UTHM electrical and electronic engineering students.

b) Research objective 2: To identify the level of entrepreneurial intention among electrical and electronic engineering students

The descriptive analysis analyzes the level of entrepreneurial intentions of electrical and electronic engineering students. According to the results of the analysis, the entrepreneurial intention corresponds to the medium level, with an average value of 2.8342.

c) Research Objective 3: To identify the relationship between entrepreneurial characteristics and entrepreneurial intention among electrical and electronic engineering students in UTHM

The results show that perceived behavioral control and entrepreneurial intention have a high positive correlation of 0.814, i.e., the higher the perceived behavioral control, the higher the entrepreneurial intention. The p-value obtained by the researchers is 0.000 < 0.01, which means that there is a significant relationship between attitude towards behavior and entrepreneurial intention. Thus, the null hypothesis (H0: There is no significant relationship between perceived behavioral control and entrepreneurial intention) is rejected. The author's findings are also consistent with those of Kolvereid (1996b), Basu and Velik (2008), and Ruhle *et al.* (2010), who found that there is a significant relationship between perceived behavioral control and entrepreneurial intention. The result is also consistent with Ruhle *et al.*'s (2010) finding that self-assessment of perceived behavioral control has a large impact on students' intentions.

It can be seen that there is a significant relationship between subjective norms and entrepreneurial intention, with a coefficient of 0.896. The p-value obtained by the researchers is 0.000 < 0.01, which means that there is a significant relationship between subjective norms and entrepreneurial intention. Thus, the null hypothesis (H0: there is no significant relationship between subjective norm and entrepreneurial intention) is rejected. The results are consistent with those of Kolveried and Isaksen (2006), that is, subjective norm is significant for entrepreneurial intention. The results also confirm that the more the subjective norms support the entrepreneurial behavior, the stronger the willingness to start a business (Yordanova & Tarrazon, 2010).

The results show that there is a significant relationship between attitude and entrepreneurial intention. The supporting statistics show that there is a very high positive correlation of 0.930 between attitude and entrepreneurial intention. This can be explained by the fact that the greater the attitude, the greater the entrepreneurial intention. According to the survey results, the researchers obtained a p-value of 0.000 < 0.01, which means that there is a significant relationship between attitude and entrepreneurial intentions. This also proves that the null hypothesis (H0: there is no significant relationship between attitude and entrepreneurial intentions) was rejected. The results are consistent with those of Kolvereid and Tkachev (1999), Dohse and Walter (2009), Paço *et al.* (2011). Scholten *et al.* (2004) pointed out that attitude has a great influence on intention, which is consistent with the author's research findings. Based on the results of this research, we conclude that perceived behavioral control, subjective norms, and attitudes are statistically significantly and positively correlated with entrepreneurial intention. Therefore, it can be concluded that entrepreneurial characteristics and entrepreneurial intention are positively correlated and significant.

5. Conclusion

Although the results of this study are satisfactory, there are some limitations in this study. One of these limitations is the time limit of data collection from the respondents. Since this study has to be conducted in a limited period of time, the sample size is small and the number of questionnaires is small, so only a limited study could be conducted. In addition, the researchers have limited time to collect information. Fortunately, the response rate of the questionnaire was 100% of the respondents.

The sampling location is also one of the limitations of this study. The reason is that the sampling was only conducted at UTHM, so the researchers cannot get opinions from other universities. Therefore, this result cannot reflect the opinion of all electrical and electronic engineering students in Malaysia. In

addition, only FKEE engineering students at UTHM are eligible for this study, and the sample size is limited to 313 respondents. With such a small sample, it is difficult to test the reliability of the study, and it also cannot represent the opinion of all UTHM students. To better understand entrepreneurial intentions, students from all faculties should be included.

Another limitation is that this study was conducted using only quantitative research methods. This may result in the respondents not being able to tell the researcher their actual thoughts since they only answered questionnaires with a Likert scale. Respondents could only choose one answer from the question and did not have the opportunity to express their feelings or opinions. As a result, the researchers might miss the opinions of some respondents and the research might not be accurate.

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Appendix A

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

Appendix B

Perceived Behavioural Control	Mean	Std. Deviation	Level
I want to be a boss	2.2907	1.4239	Low
I want to realize my dream	3.8562	1.1554	High

I want to Increase my status	3.9617	1.1485	High
I want to Increase my prestige	3.3802	1.3980	Medium
I want to have my personal freedom	2.9808	1.4740	Medium
I want to enjoy myself	3.4633	1.3656	Medium
I want to have a good economic environment	3.7764	1.2638	High
I want to challenge myself	3.1374	1.4155	Medium
I want to have my own satisfaction	3.6997	1.3006	High
I want to have my own growth	3.9393	1.1349	High
Total Average Score	3.4486	1.3080	Medium

Appendix C

Subjective Norm	Mean	Std. Deviation	Level
I want to do business because I want to use the skill learned in the university	2.3099	1.2872	Low
I have entrepreneurial family culture	2.8403	1.4233	Medium
I want to follow the example of someone that I admired	2.9297	1.4372	Medium
I want to invest personal savings	3.9169	1.1517	High
I want to maintain my family business	2.7444	1.4137	Medium
I am enjoying taking risk	2.9137	1.4195	Medium
Total Average Score	2.9425	1.3554	Medium

Appendix D

Attitude	Mean	Std. Deviation	Level
I want to provide a job security	2.8211	1.44113	Medium
I want to provide employment	3.0383	1.38390	Medium
I want to take advantage of my creative talent	2.9010	1.42092	Medium
I want to earn a reasonable living	3.0767	1.46996	Medium
I want to take the opportunities in the market	2.9649	1.46170	Medium
Total Average Score	2.9604	1.4355	Medium

Appendix E

Entrepreneurial Intention	Mean	Std. Deviation	Level
I prefer to be an entrepreneur rather than to be an employee in a company.	2.5751	1.5509	Medium
I am prepared to do anything to be an entrepreneur	3.1502	1.2909	Medium
I am very interested to be an entrepreneur	2.6741	1.3760	Medium
I shall work very hard at becoming an entrepreneur	2.9617	1.3769	Medium
I have already prepared myself to become an entrepreneur	2.7348	1.4511	Medium
My professional goal is to become an entrepreneur	2.9457	1.3565	Medium
I'll put every effort to start and run my own business	2.7923	1.4450	Medium
I have thought seriously to start my own business after completing my study	2.8658	1.3686	Medium
I want to be my own boss	2.8083	1.4616	Medium
Total Average Score	2.8342	1.4086	Medium

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