

**INTEREST IN ENTREPRENEURSHIP: AN EXPLORATORY STUDY ON
ENGINEERING AND TECHNICAL STUDENTS IN ENTREPRENEURSHIP
EDUCATION AND CHOOSING ENTREPRENEURSHIP AS A CAREER.**

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AUGUST, 2004

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*Keywords: entrepreneurship, entrepreneurship education, higher learning institute,
customer behaviour and enterprise management*

Abstract

Entrepreneurship is often thought to be a likely subject for business discipline students but not for technical students. Enterprising elements of entrepreneurship such as evaluating opportunity, developing new products, and handling start-ups are part and parcel of most business management curriculum. As for technical discipline students interested in creating their own organization after graduation, they seem to be left in dark although in many cases they are originators of product ideas. In Malaysia, there is a growing concern that technical students do not have sufficient entrepreneurial skills to venture in business particularly running small and medium enterprise (SME) set-ups. There are comments that these students have narrow business perspectives, less flexible to branch in other working areas and foresee themselves as only job seekers and not job creators. This spells the need for universities to introduce entrepreneurship subjects to non-business disciplines. The research project will concentrate on the topic of entrepreneurship education, with specific emphasis on how this education can be promoted and fostered to technical students. To best help students prepare for these new challenges, this research sought to identify an appropriate set of undergraduate courses for introduction of entrepreneurship elements to technical students and to indicate the level of student interest in these courses. Final year technical students from several public higher learning institutions of Malaysia (IPTAs) were chosen as respondents for the survey. The result shows entrepreneurship education should be incorporated into the non-business disciplines. The implication of the results led to an import set of guidelines, which can be used by educators when designing programs to suit different needs and demands of the technical students.

CHAPTER 1

INTRODUCTION

1.1 Overview

Since the beginning of the 1980s, interest in entrepreneurship has been growing around the world (Klofsten 2000). The main factor contributing to this interest was the suffering of industrialized countries from economic recession, high unemployment rates and fluctuation in international trade cycles which most of these countries have not experience before. This situation has tended to increase the attention to the potential role of entrepreneurs (Garavan and O’Cinneide 1994a) as one of possible solution to the problems face by the most of the countries. Many development agencies, such as educational and training institutions around the world are facing this challenge of how to create an enterprise culture and many of them already provide valuable and much needed assistance such as advice and financial aspects. Today entrepreneurship has become a commonly taught subject in universities. Some of the universities in the world offer courses in entrepreneurship, and many business or management schools offer major field of academic programs in entrepreneurship beside traditional business or management areas such as finance, accounting, marketing, human resource management and basic management. However research on entrepreneurship education into non- business programs is still not fully investigated especially in a developing country such as Malaysia.

Nevertheless, the interests in entrepreneurship education have also experienced unprecedented growth in Malaysia. It has been acknowledged that entrepreneurship plays a significant role within an economy, and it is an activity that can lead to economic growth. The importance of entrepreneurship to the growth of Malaysia's economy is evidenced by the sheer amount and variety of supporting mechanisms and policies that exist for entrepreneurs, includes funding, physical infrastructure and business advisory services. The establishment of a special ministry for entrepreneurs—the Ministry of Entrepreneur Development—in 1995, clearly showcases the importance that the government places upon the issue of entrepreneurship and entrepreneur development (Mohamed Ariff and Syarisa Yanti Abubakar, 2002). Recently the SME Bank, a wholly owned subsidiary of Malaysia Development Bank, plus other related agencies involved in financial, technical and training also supports the success of small medium enterprises (SMEs) which normally the starting place of entrepreneurs..

The government realized the importance of promoting SME growth, and believes that these smaller enterprises provide the bulk of job opportunities or 60 percent of the workforce (Ministry of International Trade and Industry Department, 2000). In the SME Fourth National Plan, numerous plans on government efforts to stimulate entrepreneurial activities include the provision of tax reduction, and the provision of training and financial support for existing and future entrepreneurs. Programs designed to stimulate entrepreneurial pursuits have generated a great deal of interest, although it is difficult to ascertain their effectiveness (Ministry of International Trade and Industry Department, 2005).

Realizing the importance of entrepreneurs in the development of the economy in Malaysia, efforts have been taken to nurture entrepreneurship in all ways. The government is continuously concerned to promote an enterprise culture among the school and university graduates to meet the objective of creating entrepreneurial and innovative society. As a result, education institutions, particularly higher education institutions, are entrusted with a new additional task, which is to contribute to the development of entrepreneurial talent among young graduates.

It is also crucial to understand the outcomes of entrepreneurship education though approaches to entrepreneurship education have varied across colleges and universities, from offering single courses in new business development or business plan preparation to integrated curricular that include marketing, finance, competitive analysis, and business plan development (Charney and Libecap, 2000). It is argued that core entrepreneurial skills and competencies are essential for the pursuit of effective entrepreneurial behaviour, individually, collectively and in the society (Gibb, 1998; Kirby, 2003). Entrepreneurship education does not own its exclusivity to non technical business students only but seems to become more popular among technical graduates.

Consequently, entrepreneurship educations have been actively implemented in many universities and high learning institutions in Malaysia have introduced courses related to entrepreneurship or majors in entrepreneurship. For instance, in Univerisiti Putra Malaysia (UPM), entrepreneurship is one of the subjects offered for Bachelor of Business Administration programme, in University of Malaya (UM), entrepreneurship is offered by the Department of Business Strategy and Policy, and in Universiti Kebangsaan Malaysia (UKM), Information Technology and Entrepreneurship is a compulsory subject in Bachelor of Science in Information Technology programme.

This paper aims to explore and examine, what are the determining factors that influence technical students in choosing entrepreneurship as a career? Are there any relevancies of the course subjects offered in their education programs that support the student interest to become an entrepreneur? Are the course subjects offered adequate? What types of training skills are needed to become a successful entrepreneur? To accomplish this aim, earlier research study and literature review on entrepreneurship theories are the basis used to study entrepreneurial career choice of the technical students. The research question developed to seek justification of an important effect of entrepreneurship education and personal interest on the entrepreneurial ambitions of the students. Other differences of interest in terms of entrepreneurship skills are also examined. This research, then, outlines views about the entrepreneurial environment and draws conclusions about the likelihood that technical graduates in Malaysia will choose entrepreneurship as a career.

1.2 Problem Statement

Entrepreneurship subject which normally include an exploration on starting and growing a business is often thought to be a likely subject for business discipline students but not for technical students. Enterprising elements of entrepreneurship such as evaluating opportunity, developing new products, and handling start-ups are part and parcel of most business management curriculum. As for technical discipline students interested in creating their own organization after graduation, they often seem to be left in dark although in many cases they are originators of product ideas. In Malaysia, there is a growing concern that technical students do not have sufficient entrepreneurial skills to venture in business particularly running small and medium enterprise (SME) set-ups. There are comments that these students have narrow business perspectives, less flexible to branch in other working areas and foresee themselves as only job seekers and not job creators. This spells the need for universities to introduce entrepreneurship subjects to non-business disciplines.

1.3 Purpose of Study

The purpose of the study is to assess the level of interest among engineering and technical students in Malaysia in learning entrepreneurship and choosing entrepreneurship as their future career. This research will concentrate on the topic of entrepreneurship education, with specific emphasis on how this education can be promoted and fostered to technical students. To best help students prepare for these new challenges, this research sought to identify an appropriate set of undergraduate courses for introduction of entrepreneurship elements and to indicate the level of student interest in these courses.

1.4 Objectives of Study

For the purpose of the study, three objectives have been set up to guide the research. They are as follow:

- To investigate the level of engineering and technical students' interest in entrepreneurship education.
- To examine factors that influences these undergraduates in choosing entrepreneurship as their career.
- To identify an appropriate set of undergraduate courses to be introduced to technical students for an entrepreneurship concentration.

1.5 Scope of Study

In scaling the study to a correct extent, focus has been given to technical students who are enrolled in the technical degree programs such as engineering, computer science, information technology, architecture, quantity survey, town planning, and pure sciences. a certain fields. The interest of technical undergraduates in consuming entrepreneurship education would be deduce from , their perception towards entrepreneurship, their opinion as to whether entrepreneurship is a born or made trait and their preference to enroll in certain entrepreneurship subjects that may be offered in future. The survey sample will be chosen from technical undergraduates of several IPTAs in Malaysia.

1.6 Limitation of Study

The study will focus solely on technical students and not the average of other majors such as business and social sciences. The groups that are specifically targeted for the survey are only those at the undergraduate levels of education.

1.7 Significance of Study

The result of the study would provide more insight to educators on how entrepreneurship education should be incorporated into the non-business disciplines. The implication of the results would also lead to an import set of guidelines, which can be used by educators when designing programs to suit different needs and demands of the technical students.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter provides background in entrepreneurship research previously done and findings that leads to the existence of this study. Furthermore, the chapter presents theoretical frameworks that built the conceptual foundation for the study and guide the research design and methodology.

2.2 Definition of Entrepreneur and Entrepreneurship

The term “entrepreneur” in English originates from French verb “entreprendre” which means to undertake. It specifically refers to the establishment and management of business activity. According to Hamilton (1994), before the eighteenth century, the term entrepreneur being used quite explicitly by Cantillon as “to buy the country produce from those who bring it or to order it to be brought on their account. They pay a certain price... to resell wholesale or retail at an uncertain price”. This explains an activity of independent commodity speculator. With the revolution of industry, entrepreneurs began to assume many managerial roles to adjust to new requirements of raising capital, organizing production and distributing products.

Entrepreneurs are also defined as “innovative, action-oriented people who, by devoting time and effort, create something different with value added”. They risk their time, money, comfort and status in anticipation of bigger rewards of monetary, personal and social (Solomon 1999). Drucker (1995 in Best 2001) defines entrepreneurship as innovation – the effort to create purposeful, focused change in an enterprise’s economic or social potential.

The word “entrepreneurship” became the business buzzword of the 1980s equivalent to “professionalism”, the managerial buzzword of the 1970s. Entrepreneurship quality on the parts of individual drives and aspiration to be entrepreneurs was later expanded to the idea of “intrapreneurship” or entrepreneurship concept borrowed by big corporation. Whilst the wealth, freedom and independence are the motives for individuals to be entrepreneurs, large corporations become “entrepreneurial” to gain competitive advantages over their successful competitors who may be smaller but are more innovative and adaptive to changes (Stevenson, 1994).

The word “entrepreneur” becomes popular in Malaysia in the middle of 1970 during the conception and establishment of the New Economic Policy (NEP). The developments of entrepreneur were seen as crucial to balance the achievement structure of economy in this multi race society. The word entrepreneur is being used to reflect people who run an enterprise. It is believed that the tendency to emphasis on the word entrepreneur and not traders in the NEP is due to unique characters of entrepreneurs and the size of their start-ups (Adnan Alias, 1993). Later, Adnan Alias (2004) states that “entrepreneurship is a process of creating and expanding businesses that collectively form a force for national development and societal prosperity”. Timmons (2004) supports this view by stressing entrepreneurship as strongly associated with economic growth at global level and countries with high levels of entrepreneurial activity have their economic performance at above average growth rate.

Some scholars suggest that it is not important to distinguish entrepreneurs from traders, managers or business owners by highlighting their personality traits or characters. Rather, it is more appropriate to differentiate them from the rest by looking at their activities particularly in creating organizations. In a simple form, “entrepreneurs create organizations while non-entrepreneurs do not” (Klofsten 2000).

2.3 Motivation and Approaches in Entrepreneurship

There are many theories discussing on the approaches in entrepreneurship. In this brand building discussion, the approaches is being discussed to lend basic theories that explained the motivation and action of entrepreneurs. Kuratko and Hodgetts (2004) summarized these approaches as in following Figure 1.

Figure 1: Approaches Towards Entrepreneurship (Kuratko and Hodgetts 2004).

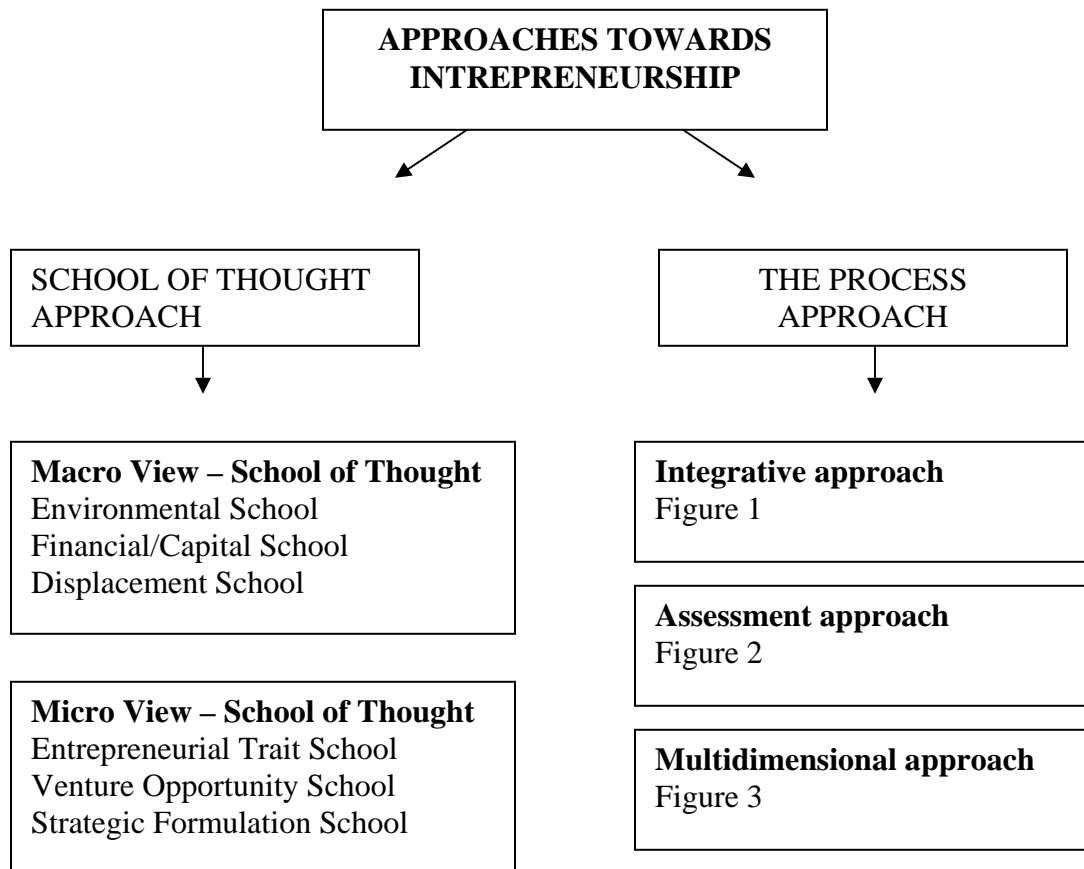


Figure 1 illustrates two specific approaches; “macro” and “micro” views. Within each view, there are three “schools of thought” which can be a foundation for entrepreneurial theory. The macro view presents a broad array of factors that relate to success or failure in contemporary entrepreneurial ventures. Under the environmental school of thought, the external factors that affect a potential entrepreneur’s lifestyle are focuses on institutions, values, and morals. The financial/capital school of thought deals with the search for seed capital and growth capital and views the entire entrepreneurial venture from a financial management standpoint. The displacement school of thought holds that the group affects or eliminates certain factors that project the individual into an entrepreneurial venture. Three major types of displacement are political, cultural and economic.

The micro view examines the factors that are specific to entrepreneurship and holds that the potential entrepreneur has the ability or control to direct or adjust the outcome of each major influence. The view discusses three schools of thought.

1. The entrepreneurial trait school of thought studies successful people who tend exhibit similar characteristics that would increase successful opportunities which are achievement, creativity, determination and technological knowledge. It also deals with the family development idea where support exists within home atmosphere.
2. The venture opportunity school of thought searches for sources of ideas, the development of concepts, and the implementation of venture opportunities. It views creating and market awareness as essentials and deals with the ability to recognize new ideas and opportunities and to implement the necessary steps of action.
3. The strategic formulation school of thought emphasizes the planning process in successful venture development. Four major factors in considering the strategic formulation are uniqueness in markets, people, products and resources.

The process approach is another consideration. It discussed three models. The Integrative Approach model is build around the concept of input to the entrepreneurial process and outcomes from the entrepreneurial process, which can determine the entrepreneurial intensity. Entrepreneurial Assessment Approach model involves qualitative, quantitative, strategic, and ethical assessments in regards to the entrepreneur, the venture, and the environment. The multidimensional approach model provides fewer distinct categories, giving it a more specific or detailed process approach to entrepreneurship by dividing into the individual, the environment, the organization, and the process (Kuratko and Hodgetts 2004).

Figure 2 : An Integrative Model of Entrepreneurial Input And Outcomes (Kuratko and Hodgetts 2004).

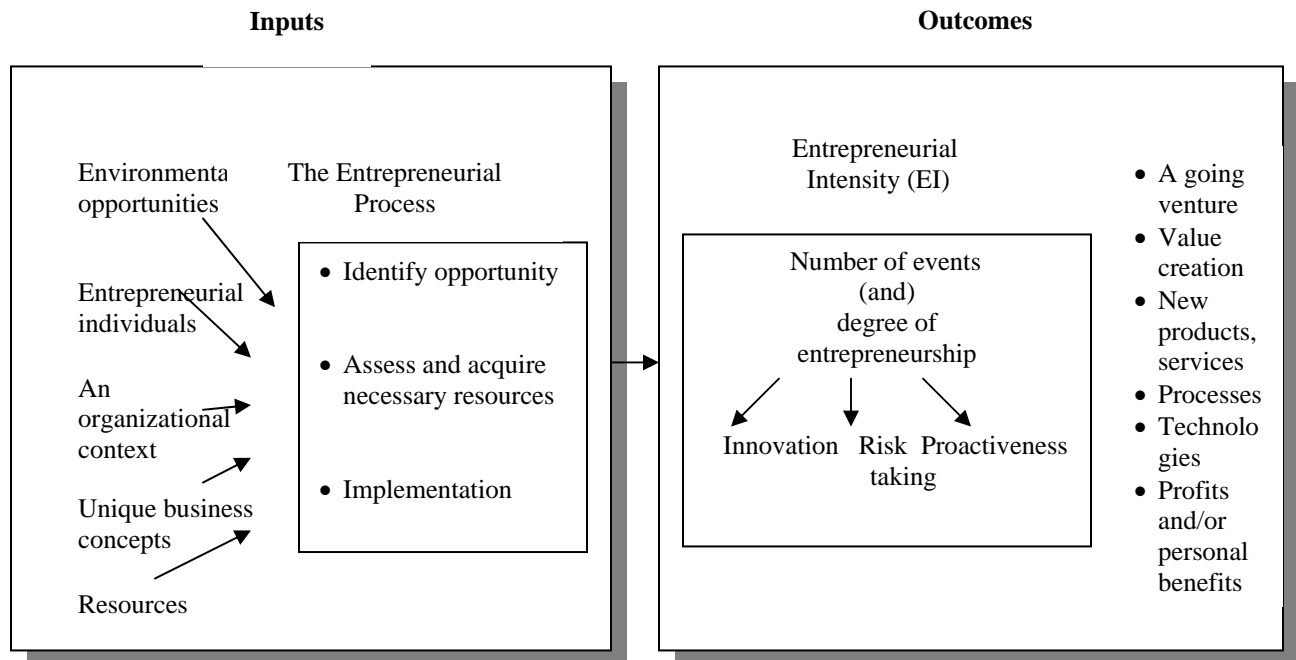


Figure 3 : Entrepreneurial Assessment Approach (Kuratko and Hodgetts 2004).

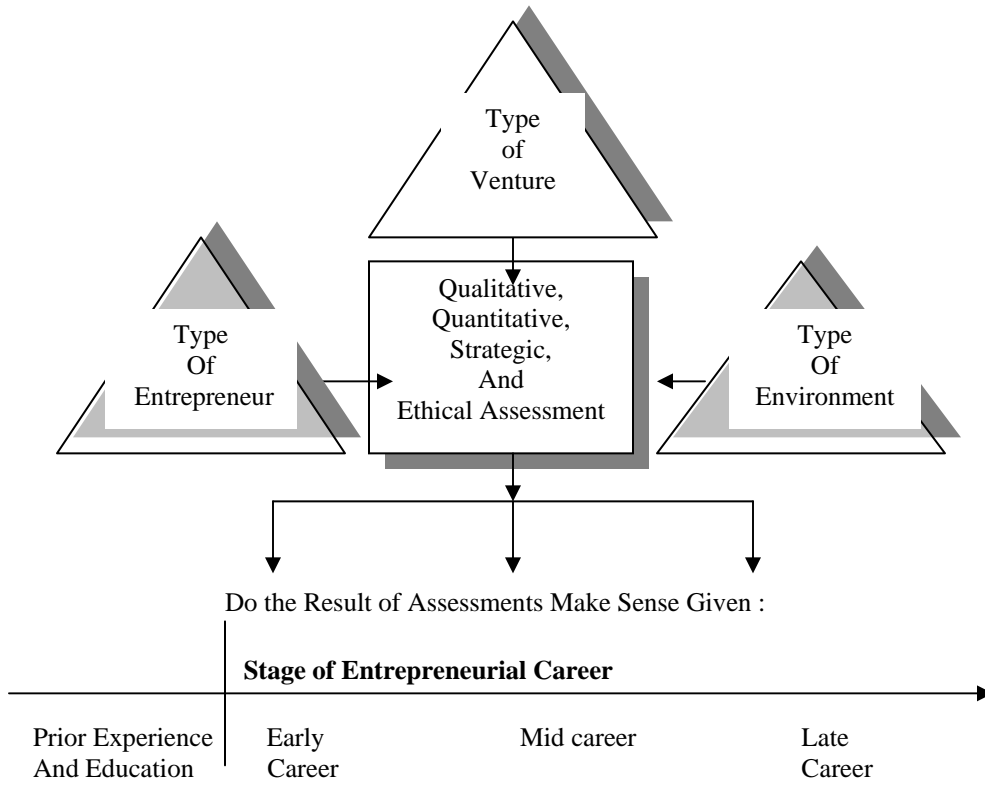
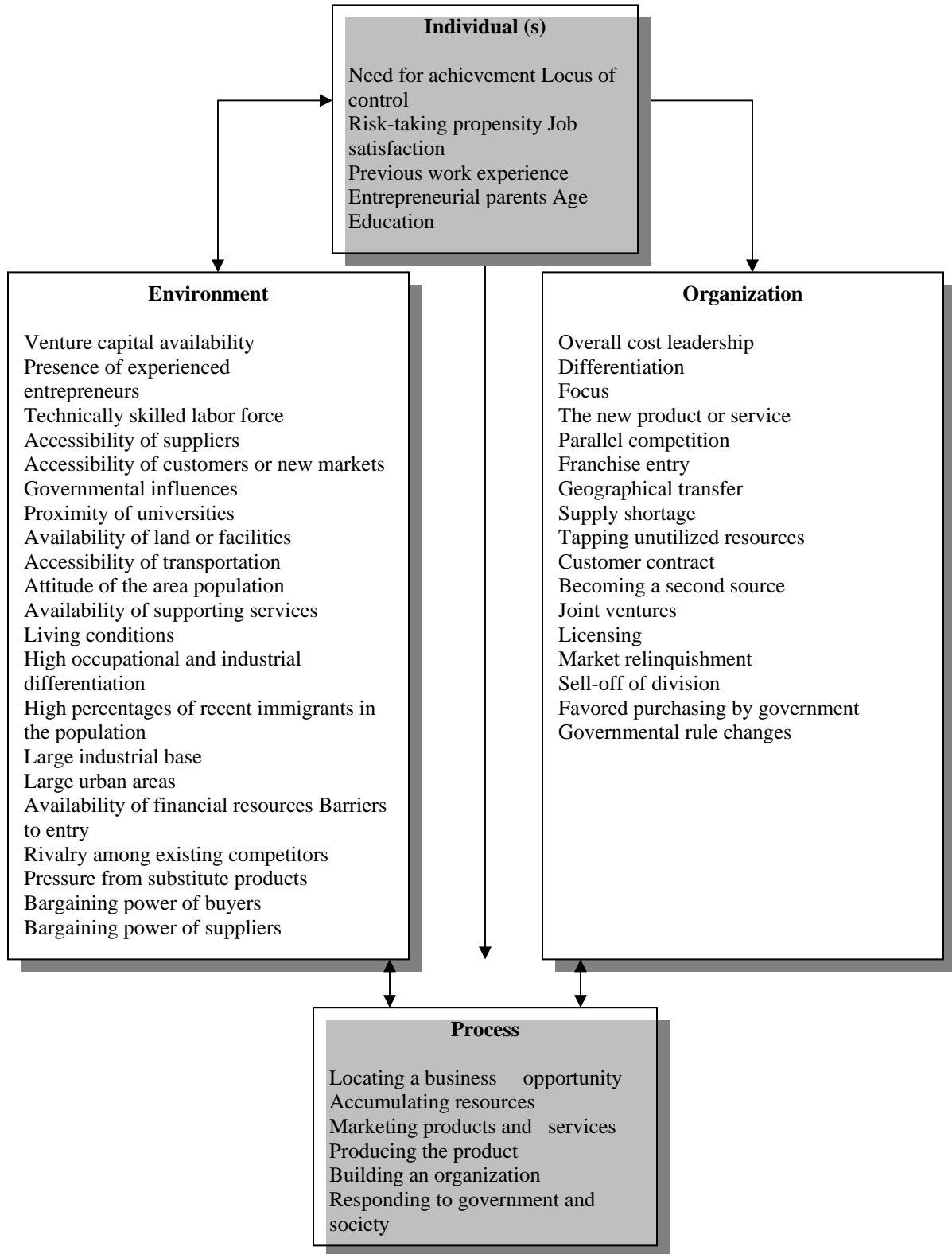


Figure 4 : Multidimensional Approaches Variables In New-Venture Creation

(Kuratko and Hodgetts 2004).



According to Bird (1988) in Timo, Jukka and Riitta (2002), entrepreneurial intention is “a conscious state of mind toward the goal of founding a business”. Entrepreneurial intentions are aimed at either creating a new venture or creating new values in existing ventures. Intentionality includes both rational/analytic thinking (goal directed behaviour) and intuitive/holistic thinking (vision) (Bird, 1988). Further, Katz and Gartner (1988) in Timo, Jukka and Riitta (2002) explains entrepreneurial intention has the role of eyeglasses through which a person seeks out information she or he can use to start a business. It may be a critical factor for the beginning of a business.

Motivation is then translated into behaviour as a function of a person and his environment. One of the main explanatory concepts of behaviour is valence, which can be seen as a vector of power that has strength and direction. It is determined by a person's internal value for a thing (e.g. money), and the attractiveness of a certain field (e.g. entrepreneurship) to fulfill the need. Vroom (1964) in Timo, Jukka and Riitta (2002) defines motivation (the force to perform an act) as a function of valence and expectancy. Furthermore, valence is a function of perceived value and perceived instrumentality.

According to Timo, Jukka and Riitta (2002), applying this reasoning to an entrepreneurial decision, the motivation to start-up is stronger, and the more a person perceives that the rewards from entrepreneurship (instrumentality) can satisfy the needs which are important for him (value), and the more probable he sees that he is going to succeed in the tasks related to entrepreneurship. It is important to notice that all these are subjective perceptions, which means that entrepreneurial motivation can be very different between different individuals due to their different perceptions of entrepreneurship.

Prior research has dealt with several types of push factors. Specht's (1993) in Timo, Jukka and Riitta (2002), literature review showed that the five most usually used contextual factors used as determinants of entrepreneurship can be grouped as social, economic, political, infrastructure development and market factors. A failure in previous organization, getting fired, or concluding that the organization or one's career is not progressing can also be treated as factors 'pushing' towards entrepreneurship.

2.4 Relevant Studies on Entrepreneurship Training and Education.

There is always ongoing discussion or a debate as to whether entrepreneurship can be taught at learning institutions. Some argue that even the most prominent entrepreneur, Bill Gates, choose to leave the grand ivy league of Harvard, halting education in seeking for entrepreneurship experience. Many believe entrepreneurship is the result of gut feeling, internal drives, timing and luck. However, Garavan (1994) suggested that “learning” entrepreneurship either from successful entrepreneurial parents, work experience or proper education will enhance the probability of success. Believing entrepreneurship can be taught, he stressed the paradigm that “entrepreneurs are often made, not born”. It is understood that the teaching responsibility does not rest entirely with the educational world. The society has its role in providing the appropriate environment and right atmosphere for the growth of entrepreneurship. Failures must not be penalized but instead analyzed, as they are also a vital part of the learning process.

Entrepreneurship education is essential in today’s society. However, there is lack of definition available to explain what entrepreneurship education is. Furthermore, entrepreneurship education has always been narrowly defined as education that provides the needed skills to setting up new businesses.

However, Hytti and O’Gorman (2004) suggest different view as they argued that there are many ways to offer entrepreneurship education, depending on the objectives of such education. If the objective of the education is to increase the understanding of what entrepreneurship is about, the most effective way to accomplish the objective is to provide information through public channels such as media, seminars, or lectures. These methods are effective in terms of sending the relevant information to a broader population in a relative short time period. If the objective is to equip individuals with entrepreneurial skills, which are applicable directly to work, the best way is to provide education and training that enable individuals to involve directly in the entrepreneurial process, such as industrial training. Lastly, if the objective of the education is to prepare

individuals to act as entrepreneurs, the most effective technique is to facilitate experiments by trying entrepreneurship out in a controlled environment, for instance through business simulation or role playing.

According to Kirby (2002), entrepreneurship education is different than “traditional” management studies as the traditional management education may impede the development of the necessary entrepreneurial quality and skills. Entrepreneurship education needs a different teaching instructive, hence, there are studies trying to relate entrepreneurship education to work related learning (Dwerryhouse, 2001); experiential learning (Kolb, 1984); action-learning (Smith, 2001), and entrepreneurial training (Gibb, 1999). In other word, entrepreneurship education is more than business management, it is about “learning”, which mean learning to integrate experience, skills and knowledge, to get prepare to start with a new venture. Entrepreneurship education refers to the formalized program to equip students with the needed skills and knowledge to recognizing business opportunities, searching customer’s insights, understanding the needs of the market, creating an idea, developing the business plan, running the business, evaluating environmental, and institutional and political issues.

Many studies that have been conducted recently have conversely showed that entrepreneurship education does play a significant role to cultivating entrepreneurship spirit among graduates. Based on a study done by Kolvereid and Moen (1997), it is shown that as compared to other students, those who have taken a major in entrepreneurship have revealed greater interest to become entrepreneurs and these students act more entrepreneurial than other students in taking up the challenge to start up a new business. Thus, it is suggested that although it may not be possible to develop entrepreneurship from education exclusively, to certain extent, education does have an effect to alter and contribute to the formation of entrepreneurship.

According to Ibrahim and Soufani (2002), school and education system play a critical role in identifying and shaping entrepreneurial traits. Other studies have pointed

out that entrepreneurship education, especially education that provides technological training is crucial to enhance entrepreneurs' innovation skills in an increasingly challenging environment (Clarke, 1990; Menzies and Paradi, 1999).

Initiatives to encourage entrepreneurship behavior among individuals particularly among university students are being implemented at universities all over the world. For example, in Australia as discussed by Breen and Bergin (1999), a joint study by the Victoria University of Technology and the Australian CPA found that 86% of their academicians agreed that there is a need for the country to develop an enterprise culture. Respondents strongly agreed to what has been referred as Karpin Report (in Breen and Bergin 1999) recommendations. Karpin Report is a Report of the Australian Industry Task Force on Leadership and Management Skills in 1995 that encouraged greater involvement of universities in the teachings of entrepreneurship and suggested a review on universities curricula in order to develop new or extended existing units of study to cover small business and entrepreneurship issues.

According to Hynes (1996), majority of universities have long been known to encourage entrepreneurship. About 93 percent of American professors in one research survey believe that entrepreneurship can be taught. Another survey of 15 "leading entrepreneurship educators" stated that their main objectives of entrepreneurship education is to teach students about the process involved in starting and running new business (Hynes 1996).

According to Klofsten (2000), rapid developments in providing entrepreneurial education are also felt by universities in Sweden. Many professorships have been created in this area to cater for the growing needs for entrepreneurship activities. For example, the Centre for Innovation and Entrepreneurship at Linkoping University together with a private network of enterprise has developed what they call Entrepreneurship and New Business Development Programs (ENP), which focused on start-up of new technology based or knowledge intensive enterprise. As at year 2000, they have successfully formed 80 new firms venturing in diverse new business areas (Klofsten 2000).

As another example, University of Glamorgan in Wales had also offered a full time course in entrepreneurship. It's Diploma in Entrepreneurship Practice (DEP) requires selected students to be involved in simulated and real projects to enhance their entrepreneurial skills, knowledge and attitudes (Evans, Williams and Deacon, 2000).

It is a challenging task for academician of entrepreneurship to introduce the subject to non-business disciplines. The question is, how and where do we start? Assuming entrepreneurship education as a new product of the university and academician as natural marketers, market research on the motivation of potential candidates (mainly technical and engineering students) on entrepreneurship curricular could provide us with better insights on their interest and awareness on the subject. In a discipline of marketing, individual acceptance of new product is a result adoption process, which started with awareness and interest before reaching the adoption stage. In other words it is pertinent to start with the understanding on needs and wants of the students which in many cases is reflected in their knowledge, interest and acceptance on the new product idea – in this case entrepreneurship course.

Table 1 below, Hynes' model explains that the education must start with inputs from students before the educators focus on content and teaching mode. Outputs would then be measured on a tangible and intangible basis. Another key elements woven into the model is the local learning environment and the macro environment.

Table 1: Hynes' process model of entrepreneurship education.

Hynes' process model of entrepreneurship education			
Inputs students	Content Focus	Teaching Focus	Outputs
Prior knowledge base Motivation Personality Needs/Interests Independence Attitudes Parental influence Self esteem Values Work experience	Entrepreneurship defined Intrapreneurship Innovation New product development Idea generation Market research Feasibility of idea Finance Production Regulations People Management Teamwork Business Marketing Management	Didactic (read/lecture) Skill building (case studies group discussions, presentations, problem solving, simulations, teamwork, projects) Discovery (brainstorming, personal goal setting, career planning, consultancy)	Personal (confidence communication) Knowledge (enterprise, initiative, self employment, business, management and market skills, analytical, problem solving, decision making, communication, presentation, risk taking) Career (improved knowledge, broader career options, less structured career perspectives)
"Environment" = local learning environment & broader macro environment			

2.6 Relevant Studies on Entrepreneurship Career Development

The decision to pursue an entrepreneurial career may be regarded as the closest prerequisite for a successful entrepreneurial career (Schmitt-Rodermund, 2004). It is believed that people's attitudes towards performing a given behaviour are based on beliefs that performing the behaviour will result in desirable outcomes.

Entrepreneurial career development has also been a research area where undergraduate and graduate students have been used as subjects. Determining work values and career intentions in relation to organizational employment versus entrepreneurship (Brenner, Pringle, & Greenhaus, 1991); the impact of a family business on entrepreneurial

intentions and attitudes (Krueger, 1993); and understanding what factors are influential in developing entrepreneurial career aspirations (Scott & Twomey, 1988) are examples of such research.

In other study (McQuaid, 2002a), there are a number of perspectives of what is meant by the term 'entrepreneurship' that some focus upon business development aspects, while others focus upon entrepreneurial behaviour, which may be linked to activities of those in the non-commercial sectors as well as commercial sectors. For instance, entrepreneurship is often considered synonymous with 'new firms' and or existing 'small, micro and medium-sized enterprises' (SMMEs), and or owner-managers or in some cases 'dynamic' or fast growing new firms. Elsewhere entrepreneurship is seen as: having specific functions in the economy, particularly in innovation and resource allocation with entrepreneurs seen, for instance, as innovators; or as a form of behaviour, concerned with the systematic grasping of opportunities; or as a set of personal characteristics, cognitive styles, attributes or motivations (i.e. risk taking or being a 'great leader') of entrepreneurs. Often the term entrepreneurship is used loosely, covering a number of meanings.

The general attitude of the public toward entrepreneurship and the understanding and support of the importance of entrepreneurship in society are key social and cultural norms. Furthermore, entrepreneurship has been seen as a key to economic development in many countries across the globe for many years (UN, 2004). The relationship between entrepreneurship and economic growth, poverty and sustainable development is crucial for future global development, policy and research.

No doubt that the definition of entrepreneurship characteristic and entrepreneur has an important consequence on its understanding, but the most important aspect is the development or enhancement of entrepreneurial characteristics and entrepreneurial competence, the availability of conducive entrepreneurial environment and development.

Based on the above discussions, it is clearly shown that the characteristics of an entrepreneur are considered importance in the success of the business. As such, one of the

recognitions of the need is by developing an entrepreneurship curriculum and business environment and development to inculcate and nurture the entrepreneurship culture and competence in high learning institution. These include the provisions of business premises, the “incubation systems”, student business loans and other training programs. Various forms of businesses such as franchising, partnerships, retailing and food services and other service businesses have been encouraged and supported by many universities.

Not much research studies have been conducted in Malaysia into the outcomes of entrepreneurship education particularly among the technical students as the introduction of the subject to technical students is still at its preliminary stage. However, it is noted there are considerable number of students of technical graduates are interested in business ownership and entrepreneurship. However, many students and graduates perceive several obstacles that oppose against business start-ups, such as lack of experience, or lack of finance, which block the path toward their preferred choice. The problem of this inconsistency may lie in the present curriculums, which have focused almost entirely on the needs of aspiring middle and functional managers rather than the needs of aspiring entrepreneurs.

Traditionally, universities and colleges have not prepared students for self-employment as a career option, which resulting in the loss of many potential entrepreneurs. As a result of this educational bias to large businesses and lack of information on self-employment as a career option, many universities and colleges are now offering topics and courses related to entrepreneurship and small business.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The literature review indicates a need to further explore and extend the research in technical students' perceptions towards entrepreneurship education and their interest in choosing entrepreneurship as a career. This chapter will present the design of the study. Specifically, this chapter discusses the theoretical and conceptual models of the study, population and data sampling procedures, instruments for collecting data, data collection and analysis of data.

3.2 Design of the Study and Theoretical Framework

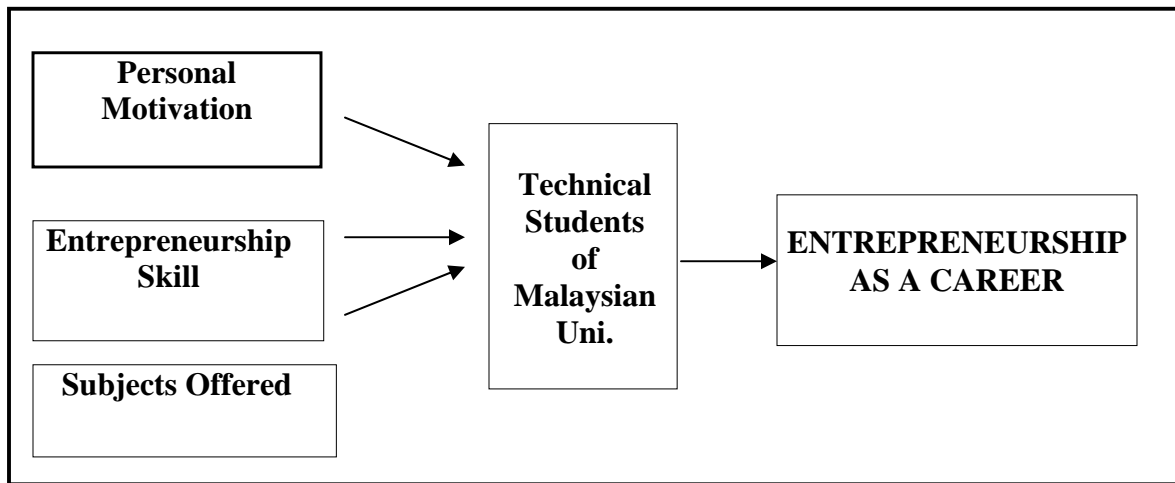
With uncertainty and an unrealistic scenario for most graduates entering employment, and traditional career paths becoming less secure and less predictable within large organizations, graduates need to be more flexible in their attitudes towards employment (Kuehn 1998). From the scenario quoted from Kuehn (1998) and suggestion

made by Hynes (1996), we analyzed the views and attitudes of science and technology undergraduates towards introduction of entrepreneurship subject (as a product) in their degree programs.

The growing literature on entrepreneurship education tends to argue that a different learning environment is required to support the study of entrepreneurship within a university setting (Gibb, 2002). The orientations and behaviors of students and young graduates are influenced by a number of personal and environmental factors (Luthje and Franke, 2003). Further according to Luthje and Franke (2003), early empirical research has shown that the presence of entrepreneurship education program and a positive image of entrepreneurs within the university are both incentives for students to choose an entrepreneurial career. Other researches have tried to explain the relationship between entrepreneurship program and characteristic such as need for achievement and locus of control (Hansemark, 1998) or the perception of self-efficacy (Ehrlich et al., 2000). They found that entrepreneurship education had a positive impact, enhancing these characteristics and the likelihood of action at some point in the future.

Basically, the likelihood of engaging in entrepreneurial interest of the technical students could therefore be used to measure the impacts of entrepreneurship education. Nonetheless, the theoretical framework presented in Figure 1 is to construct a conceptual model for evaluating the personal motivation influence factors, entrepreneurship skills and the relevancy of course subjects offered in the area of entrepreneurship that support students' interest to be an entrepreneur. The model should to certain extent, to understand the impact of specific variables on changes of entrepreneurial interest.

Figure 5: Theoretical Framework underlying the evaluation factors on entrepreneurship as a career choice



3.3 Sampling Procedure

Undergraduate technical students from several Malaysian IPTAs were chosen as convenience samples of this study. Amongst of their current majors are namely:

- (1) Engineering
- (2) Science
- (3) Geology
- (4) Information Technology
- (5) Other Technical Degrees
- (6) Architecture
- (7) Medical

The chosen public universities (IPTAs) are namely Universiti Kebangsaan Malaysia (UKM), Universiti Putra Malaysia (UPM) and Kolej Universiti Institute Teknologi Tun Hussein Onn (KUITTHO)

It is also to be noted here that an earlier study with a title “Introducing Entrepreneurship Curriculum into Technical Disciplines: An Example from Malaysia” by

Fauziah and Rohaizat has been conducted between 2001-2002 on similar respondents at University Technology Malaysia (UTM). As such the result from this earlier research and other similar research by different authors would also be reported in this paper as comparison to the current research.

3.4 Measurement and Instrument Development

Most of these universities have not yet introduces an entrepreneurship subject in their degree programs. A survey of students was conducted to assist in developing potential courses for the academic curriculum. This approach follows the general method of developing topics and then eliciting student interest in them (see Duke 1996). Data were gathered through a self-completion questionnaire, which comprised 20 major questions, with additional sub-categories where appropriate. Most of the questions took the form of a set of statements by using a type of intent-to-purchase scale, which were judged by students on a Likert Scale of 1 to 4, with a scale value of one being Not at All Likely and a score of four being Absolutely Likely. Final year undergraduates at the beginning of scheduled classes completed the questionnaires. The convenience and judgment sample from the technical and engineering courses was deliberately chosen to obtain as many different majors as possible. Each set of questionnaire was prefaced by a covering letter that explained the purpose and importance of the survey, and provided assurances that all questionnaire responses would be treated with the strictest confidentiality.

In order to translate the collected data into meaningful research result, a statistical technique was applied for the study. The analysis for this study was carried out by using SPSS a computer program that helps to accelerate the statistical figures such as generating frequency tables, descriptive statistics and many more. The SPSS would be used for analyzing the quantitative data. The information collected would serve as essential inputs for educators in high learning institutions in Malaysia to design a more effective learning of entrepreneurship.

CHAPTER 4

DATA ANALYSIS

4.1 Introduction

The questionnaire was distributed to university students at three universities in Malaysia. Personal interview was suggested as a good contacted method to bring immediate and more reliable data to the survey. In total, questionnaires were sent to 300 students and all completed the questionnaires. The data were gathered during the university term break season from 1st July up to 10th September 2004. This chapter presents the data analysis and able to achieve the research objectives. The data collected in this survey are interesting and can be very useful to practitioners and educators. In the first section of this chapter was socio-demographic profile of respondents, and descriptive summaries data. In the second section, the opinions and knowledge about entrepreneurship will reveal. The third section determined the intention to be entrepreneur and suggested curriculum design by the students. The detailed finding can be obtained from the sections discussed below.

4.2 Descriptive Statistics

A total of 300 questionnaires were collected from the universities' sources across faculties at undergraduate levels. The breakdown of these students by discipline is given in Table 2. In terms of general characteristics, 51.0 per cent of them were male, and 49.0 per cent were female. A breakdown of the respondents' academic length of study indicated that 36.7 per cent in first year, 27.7 per cent in second year, 28.0 per cent in third year and 7.7 per cent in fourth year.

Table 2

Distribution of students by academic program

Faculties	Responses (numbers)	Responses (percentage)
Engineering	506	56.5
Science	192	21.5
Geology	103	11.5
Information Technology	40	4.5
Others	40	4.5
Architectural	12	1.3
Medical	2	0.2
Total	895	100.0

Table 3 lists the most frequently cited keywords associated with the term entrepreneur, nearly more than twenty words provided by the respondents, but the most famous such as 'money'; 'risk'; 'profit'; 'creative' and 'business'. Compare to the study done by

Henderson and Robertson (1999) at Leeds Metropolitan University with half of the samples was studying an elective subject (Running a small Business), the words associated with entrepreneur were ‘risk-taker’; ‘motivated’; ‘ambitious’ and ‘successful’. The tendency for the local technical undergraduates to associate entrepreneurship with business and money was also apparent in earlier study by Fauziah and Rohaizat (2002) on UTM students who choose ‘business’; ‘capital’ and ‘management’ more often than the word ‘risk’.

Table 3

Keywords associated with the Term

Keywords	Responses (numbers)	Responses (percentage)
Business	415	60.0
Capital/profit/money	108	15.6
Creative/innovative	60	8.7
Risk	50	7.2
Self-employed/self-sufficient	36	5.2
Success	15	2.2
Enterprise	8	1.1
Total	692	100.0

In keeping with the controversy in the literature (see Garavan and O’Cinneide 1994a; Hynes 1996), the respondents’ views as to whether entrepreneurs are “born” or “made” were shown in Table 4. The results on this question indicated that 68.5 per cent of the respondents agreed that entrepreneur can be taught and suggested a major role and

need for entrepreneurship education and training. This findings supported a few findings stated that entrepreneur can be taught (see Duke 1996; Kolvereid and Moen 1997; Henderson and Robertson 1999, Klofsten 2000, Fauziah and Rohaizat 2002).

Table 4

Are Entrepreneurs born or made?

	Responses (numbers)	Responses (percentage)
Born	143	16.1
Made	418	47.2
Combination	325	36.7
Total	886	100.0

When considering their definitive career plans many were preoccupied with short-term horizons linked to the completion of their studies (Table 5). From 300 students interviewed, only 30 will be running their own business immediately after graduation.

Table 5

Entrepreneurs as career choice

	Responses (numbers)	Responses (percentage)
Upon my graduation, I'll be running my own business immediately	30	12.8
After my graduation, I'll be working full time with a company and at the same time running my own part-time business	44	18.8
After my graduation, I'll be an employee for a company before venturing into my own business	68	28.9
I'll be the managers or intrapreneurs for other people's company	40	17.0
I'll be an entrepreneur in future	53	22.5
Total	235	100.0

Respondents also indicated their agreement with question about perception of respondents toward introduction of entrepreneurship subject into their technical programmes. About 70.3 per cent agreed that the entrepreneurship should incorporate in their programmes and about 58.7 per cent also agreed that they are interested to register the subject as a value added in their programmes.

Table 6 shows the results from the survey about what kind of subject should be taught in entrepreneurship subject when it introduces in the technical programmes of their Malaysia IPTAs. Advertising dominated across all respondents suggesting that stories about creativity and technology applied into business are influential. In addition the needs for business knowledge such as product development and marketing were mentioned and selected. Comparing these findings to the earlier study by Fauziah and Rohaizat (2002) on UTM students, almost 28% of UTM respondents choose management subject which include strategic planning, decision making, general accounting and administration while 23% suggests economy subject comprising marketing, internal economy, globalization, product development and local economy.

Table 6

Course subject or areas in entrepreneurship curriculum (n=300)

	Responses (percentage)
Advertising and selling skills	34.2
Product development	29.5
Marketing	27.4
Introduction to Business	24.8
Financing small business	21.4
Commercialization	20.1
Small business accounting	19.2
Principle of management	19.2

4.3 Conclusion

In circumstances where graduate employment prospects are never assured, the chance of becoming self-employed remains an employment option, which also allows the graduate to become master of their own destiny. It is a perception that graduates in this study will have good technical skills that could, given favorable circumstances in the labor market place. However, as we discovered in the analysis of this study, graduate will consider the option of new firm formation are very small.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATION

5.1 Introduction

The results contained in this paper raise a number of issues relevant to policy, which might, if addressed in terms of ameliorative action, lead to a more conducive environment for graduate employment and new firm formation. A primary objective of this research was to understand student interest in a variety of entrepreneurship courses that will be introduced in the technical curriculums.

5.2 Discussion

Tertiary education institutions in Malaysia, especially those offering the technical and engineering programmes must monitor and adapt to the continuous changes taking place in the surrounding environment. Comments from the industry (see Kuehn 1998) and few findings stated that the students were graduating with a very narrow and theoretical degree which reduced their flexibility to work in different areas of the organization (see Hynes 1996; Jack and Anderson 1999) and changing structure of firms such as “down-sizing”, and “outsourcing” encouraged by technology (see Henderson and Robertson 1999) must be addressed accordingly. Therefore, a considerable challenge faces educators and trainers to derive programmes, which are appropriate for preparation for

learning in the outside world. The traditional approaches in teaching the technical degree for preparing students in workplace seem increasingly inappropriate and the entrepreneurship is the best responds to the realities (Kuehn 1998). The clear message from the results is that technical students are respond to the changing environment and they wanted the “value added” in the programmes. Such an environment also points to greater need for entrepreneurial activity (Henderson and Robertson 1999). From the findings in this research, entrepreneurship education should be incorporated into the non-business disciplines where business and product ideas emerge. Further more, at the student or graduate level, it crucial that students seek to develop the core skills on which employers are placing increasingly greater emphasis. Entrepreneurship is the answer and Kotter (1995) found that nearly 50% Harvard MBA graduates (some of them from technical background) from the class of 1974 were either entrepreneurs or actively moving in that direction.

This research evolves from the belief that unemployment and under-employment among Malaysian graduates from the tertiary educational institutions remain unacceptably high and needs redressing. This is due to fewer avenues for job opportunities. It also stems from the belief that tertiary level academic training prepares students to work for other people and most of these jobs are white collar corporate types. Thus, entrepreneurship educational programs are now available at most of the higher learning institutions in Malaysia as an attempt to reverse the unemployment trend by providing the necessary training in entrepreneurial skills to students to establish and manage their own businesses and to consider self-employment as a career option on completion of their studies.

The evidence from the study appears to indicate that an entrepreneurship education is perceived to provide knowledge and skills to business start-up creates awareness about the existing business opportunities and raises self-confidence and self-belief to enter into self-employment. It thus appears to have brought about in the respondents a high perception of desirability and likelihood of business start-up or self-employment, which were previously low among graduates from tertiary educational

institutions. At any rate, it is obvious that an entrepreneurship education is essential in Malaysia and the chronic graduate unemployment rate could be reduced to some extent.

Consequently, the program offers in higher learning institutions must be monitored and adapted to the continuous changes taking place in the business-surrounding environment. However, despite positive findings and highly positive talk about entrepreneurship, there was a certain barriers exist. One of the barriers is internal priorities among technical programmes, such as reluctant among technical academicians to redesign the curriculum because the accreditation issues from the professional bodies. The other one is the questions about necessary competency to the credibility of the one supplying the lecture or training because not all academicians who taught the entrepreneurship subject have an entrepreneurship experience.

This research have met all the three stated objectives of the study and the findings also provide an important set of guidelines, which can be used by educators when designing programmes to suit different student need and demands and others parties. The different sets of specific entrepreneurship subjects also needed to fit strengths and mission the university. Additional work can be done in the future to understanding the barriers to interest in student groups such as the lack of interest from technical students in entrepreneurship with perception that these professions have a high likelihood of self-employment.

5.3 Future research

There are some limitations of the present study. First, the sample population inevitably limits the conclusion that can be drawn from the present findings, for example, graduates from only four higher learning institutions in Malaysia. Further research is required to incorporate a wider range of graduates and from the different higher learning institutes. Future research may apply conjoint analysis to different attributes, such as limited to certain factors. Researchers also can consider whether other sources of data

such as feedback from alumni and employers from the industries such as manufacturing, banking, telecommunications or significant others.

However, despite the weakness found in this research, the present research can be seen as a preliminary investigation of the opportunity for increase value-added materials to strengthen the syllabus in the university's program. Hopefully with better understanding in entrepreneurship among future graduates, the nation would be able to expand its human resource capital in entrepreneurs. This definitely will spur our intention to become a nation of entrepreneurs of a developed country in accordance to the Malaysia Vision 2020 dream of success.

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