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# Appraising entrepreneurial intensity of public universities

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### ABSTRACT

This paper examines the process of how the local universities in Malaysia are and were trying to change their roles in the Malaysian economy in order to respond to this current development as well as the globalization of the knowledge economy. This study intends to explore the dimensions of entrepreneurial university in Malaysia and develop questionnaire to test the entrepreneurial intensity of local universities in Malaysia. In aspiring to achieve the status of a fully developed nation by 2020, tertiary education in Malaysia has been targeted to grow on its own by becoming more entrepreneurial and self-reliant. There is an urgent need for the shift from the traditional model of the universities to the new "entrepreneurial" model. The new entrepreneurial model for public universities in Malaysia is expected to be different from the universities in the advanced economies due to several reasons. The reasons include more rigid bureaucratic control by the government, emphasis on homegrown innovation and lack of commercialization demand and ability.

Six main theoretical models of entrepreneurial universities were identified and in each one, there are elements or characteristics associated with the inputs as can be found in Morris's Input-Output Perspective theoretical framework. This model will be used to measure the entrepreneurial intensity in the context of education institutions as an organization.

Dimensions of entrepreneurial university in Malaysia will be explored through expert survey employing Delphi Method. Instruments to measure the entrepreneurial intensity of public universities will then be developed. This will be used to appraise the entrepreneurial intensity of the public universities in Malaysia.

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### Introduction

The Malaysian government had formulated the New Economic Model (NEM), whereby every sector of our economy including education achieved its Key Performance Indicators (KPIs). This is to ensure that we achieve common goals of the nation. Tertiary education has been targeted to grow on its own by becoming more entrepreneurial and self-reliant. Hence, the need to examine the process of how the local universities in Malaysia change their roles in the economy in order to respond to this current development; as well as the globalization of the knowledge economy is needed. There is an urgent need for the shift from the traditional model of the universities to the new "entrepreneurial" model in the context of Malaysia which is considered as a newly industrialized economy (NIEs). The entrepreneurial model for public universities in Malaysia is expected to be different from their counterparts in more advanced economies given the differences of environment in which they operate. Moreover, for certain reasons which include a more rigid bureaucratic control by the government, a lower base of research and inventive outputs coming out from the university, and lower demand and ability of private enterprises to commercialize university knowledge. In this study, the concept of entrepreneurial intensity by Morris and Sexton (1996) will be adapted and a model that suits the public universities in Malaysian context will be developed.

### Problem Statement

According to Morris et al. (2002: p. 54), "entrepreneurship is not something an organization either has or does not have; it is a variable". "There is some level of entrepreneurship in every

organization therefore the question becomes one of determining how entrepreneurial a given organization is" by using the concept of entrepreneurial intensity (Morris et al., 2002:p. 54) Previous studies have shown that there is no research done on a model of entrepreneurial university in Malaysia. Furthermore, most of the previous studies on entrepreneurial universities have been done via case studies or surveys on universities that are considered as entrepreneurial. Therefore in this study, instead of selecting the universities that are considered as entrepreneurial, it will be done via survey to measure the level of entrepreneurial intensity of all the public universities in Malaysia.

According to Morris et al. (2002: p. 69), "To assess the overall level of entrepreneurship in a company, the concepts of degree and frequency must be considered together." The entrepreneurial intensity model by Morris and Sexton has been used in various organizations such as Procter & Gamble, Nucor, Minnesota Mining and Manufacturing Company, Wendy's and Level 3 Communications (Morris and Sexton, 1996). These organizations are successful companies that exhibit varying degrees of entrepreneurial intensity. Another study on Kibbutz communities in Israel has been conducted to explore the factors influencing entrepreneurial intensity (Heilbrunn, 2008).

Previous studies also demonstrate that this model has never been used to measure the entrepreneurial intensity in the context of public universities as a not-for-profit organization. However, some changes are needed in order to suit this context. As stated by Morris et al. (1994: p. 29), "the input-output perspective is descriptive of entrepreneurship in not-for-profit organizations, with the outputs taking on slightly different interpretations."

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Furthermore, this model has never been used before in Malaysia and according to Morris (1994: p.30), “much like organizations, countries would appear to differ in terms of their entrepreneurial intensity.”

Existing models of entrepreneurial universities are based on practices of universities in more advanced economies. According to Wong, et.al. (2007), there are three reasons (i.e. more rigid bureaucratic control by the government, less emphasis on home grown innovation, lack of demand and ability to commercialize) for the urgent need of universities in Asian new industrialized economy (NIEs) to shift from their traditional model to the new “entrepreneurial” model. These will clarify why the model of entrepreneurial university for public universities in Malaysia is expected to be different from the universities in more advanced economies.

Firstly, the public universities in Malaysia compared to other developed countries, these institutions are comparatively younger. Furthermore, these public universities are owned and regulated by the government where all staffs are considered as government employees and tasked to carry out government policies. Hence, the public universities in Malaysia tend to have much less degree of autonomy than public universities in Europe and also the private universities in the United States of America where most of the studies of entrepreneurial universities were conducted.

Secondly, Malaysia lack of home-grown innovation and placed a much stronger emphasis on absorbing and diffusing technological knowledge from the advanced countries. Previous years, the public universities in Malaysia tend to have less emphasis on new knowledge creation through local research activities and depends more on foreign technologies and knowledge. However, nowadays, government has started to encourage home-grown innovation. In the context of public universities, Ministry of Higher Education (MOHE) had chosen 4 designated research universities and each of the universities was awarded RM100 million grants for research, development and commercialization activities.

Thirdly, most of the local private enterprises in Malaysia still lack in research and development and also innovation activities as compared to advanced developed countries. This is due to lack of experience and not competent to commercialize knowledge generated from local universities.

From these three factors, which include more rigid bureaucratic control by the government, less emphasis on home grown innovation, lack of demand and ability to commercialize, suggest that more efforts are needed for the universities in Malaysia to become entrepreneurial university as compared to the advanced and developed economies. Some of the methods used to measure entrepreneurial universities in the advanced economies may not be suitable in Malaysia. Similarly, the organizational structure and system of the public universities would need to be reformed to transform the culture and mindset of their staff towards knowledge commercialization.

For these reasons, this proposal intends to fill the gap of knowledge regarding the variables of entrepreneurial intensity of universities since all universities are involved in entrepreneurial activities to a certain degree. The entrepreneurial intensity model by Morris will be adapted to suit universities, mainly public universities in Malaysia and further develop an instrument to reveal the actual situation regarding entrepreneurialism in education institutions.

### **Research Objectives**

The main objective of the study is to measure/ appraise the level of entrepreneurial intensity of public universities in Malaysia.

Specifically, the study is conducted to fulfil the following objectives:

1. To develop dimensions of entrepreneurial university in Malaysian context
2. To formulate an instrument for measuring entrepreneurial intensity of public universities in Malaysia
3. To assess the level of entrepreneurial intensity of public universities in Malaysia

### **Research Questions**

1. What constitutes an entrepreneurial university in Malaysia?
2. What measurements are appropriate to assess the entrepreneurial intensity of local universities in Malaysia?
3. What is the level of entrepreneurial intensity of the local universities in Malaysia?

### **Significance of Study**

“Much has been written and discussed about the nature of the pressures for change in the Higher Education sector both from the viewpoint of the internal organization of universities and, more fundamentally, their changing role in society” (Gibb and Hannon, 2006: p.9). “There is a broad consensus as to the nature of the pressures on higher education throughout the world to become more entrepreneurial or enterprising” (Gibb and Hannon, 2006: p.9).

The issue is more significant for government funded education institutions. “Certainty in the environment has been reduced by changes in funding” (Gibb, 2009: p.5). At one time, the system is nearly total central or regional public funding however the situation has changed where a mounting proportion of finance has to be required from non-direct public sources including fees, research grants, local development monies, alumni, industry and social enterprise, contract research and philanthropy (Williams, 2009). This scenario can be observed in most of the developed countries. “Some governments, example Finland, are providing direct financial incentives to higher education institutions to leverage public funding” (Gibb, 2009: p.5).

As for now, all public universities in Malaysia are government funded. In becoming a developed country, public universities are warned to be prepared for these changes and faced the challenges ahead. Efforts to strengthen public higher education institutions (IPTA) are specifically mentioned in recent Budget 2010 announcement. The public universities have to be more competitive to improve their world ranking. The government is considering in granting public universities greater autonomy in managing finance, human resources, administration, student- intake and income generation. With greater autonomy, for example, public universities will be allowed to establish subsidiaries to generate revenue. To achieve this objective, the Government will consider relaxing rules and regulations, which hinder public universities from generating their own income. This will enable public universities to reduce their financial dependence on the government (Budget 2010). All of these developments call for public universities to become more entrepreneurial.

The findings would provide valuable information for universities in newly industrialized economies in order to achieve the status of an “entrepreneurial university”. It can also be used to rank the entrepreneurial intensity of universities in Malaysia. The policy makers would be able to determine the appropriate support for these universities as well as their needs.

### Scope of Study /Delimitation

This proposed study will only look into public universities in Malaysia at the entrepreneurial level. Private universities, university colleges and colleges in Malaysia will not be studied.

### Limitations to Study

The result derived from this study cannot be used to generalize in private universities and colleges. It also cannot be compared with universities from other countries since the laws and regulations are different and this will limit the applicability of the findings. There is also a methodological constraint where in this study, Delphi method is used. The proxies chosen are limited to the experts from public universities.

### Definition of Terms

Several terms need to be clarified for independent variables and dependent variables.

These would include:

**Entrepreneurial University:** refers to “a university that has the ability to innovate, recognize and create opportunities, work in teams, take risks and respond to challenges (Kirby, 2002), and which seeks to work out a substantial shift in organizational character to arrive at a more promising posture for the future (Clark 1998)” (Cano, 2007: p. 29)

**Entrepreneurial Intensity:** refers to a concept that capture both the degree and amount of entrepreneurship evidenced within a given organization (Morris & Sexton, 1996).

**Innovativeness:** refers to “the seeking of creative, unusual or novel solutions to problems and needs” (Morris et. al, 1994: p. 26).

**Risk-taking:** refers to “the willingness to commit significant resources to opportunities that involve a chance of costly failure” (Morris et. al, 1994: p.26).

**Proactiveness:** refers to “top management orientation in pursuing enhanced competitiveness, and includes initiative, competitive aggressiveness and boldness” (Morris et. al, 1994: p. 26)

### Literature Review

The review of the literature begins with the theories of entrepreneurship. Next, the definitions of intrapreneurship is presented, followed by a description of the inputs (i.e. environmental opportunities, organizational context, entrepreneurial individuals, unique business concepts and resources) and the three dimensions (i.e. innovativeness, proactiveness and risk-taking) in the integrative approach of the entrepreneurial process by Morris et. al (1994) which will be used to measure the entrepreneurial intensity of local universities.

Definitions of entrepreneurial university which are categorized into the three dimensions are explored in the next section. Next, the theoretical models of entrepreneurial university which are categorized into the inputs suggested by Morris are presented.

### Theories of Entrepreneurship

There are many approaches to entrepreneurship in order to understand the nature of entrepreneurship. Many of the previous studies focus on examining the (entrepreneurial) person, however nowadays, attention has moved to examining the process. Approached as a process, a number of researchers in the 1980s suggested that entrepreneurship is functional to all sizes and types of organizations (Brandt, 1986; Kao, 1989; Pinchot, 1985). The research on entrepreneurship has evolved dramatically over the years and the most suitable way to analyze universities is by using the process approach since it involves activities in entrepreneurship in an organization.

According to Kirby (2006), there are two entrepreneurship theories to guide universities. One is the cognitive models of entrepreneurship development – Azjen’s (1991) theory of planned behaviour where its main focus are individuals which suggested that if they believe they have the capability, there are environmental possibilities and there is social support, these will activate their entrepreneurial potential. The second theory is the theory of intrapreneurship development – Pinchot (1985). He suggests that if established organizations are to re-discover their entrepreneurial drive, there needs to be:

- Senior Management Commitment to Entrepreneurship
- A Corporate Model for Entrepreneurship
- The development of an Intrapreneurial Culture
- The Identification of Intrapreneurial Talent
- The Monetary and Non-Monetary Rewarding of Intrapreneurs
- An identifiable system for administering and evaluating projects (strategic actions to promote enterprise)

The first model suggested by Azjen (1991) focused on individuals whereas the theory developed by Pinchot (1985) focused on individuals as well as on the process that occurs in an organization. The term used is intrapreneurship i.e. entrepreneurial activities in existing organizations. Authors use many terms to refer to different aspects of intrapreneurship (Pinchot, 1985; Kuratko et al., 1990): corporate entrepreneurship (Burgelman, 1983; Zahra, 1993), internal corporate entrepreneurship (Schollhammer, 1982), corporate ventures (Ellis and Taylor, 1987; MacMillan et al., 1986), venture management (Veciana, 1996), new ventures (Roberts, 1980) and, internal corporate venturing (Burgelman, 1984).

The main definitions of ‘intrapreneurship’ or ‘corporate entrepreneurship’ have been listed in Table 1.

As summarized by Antoncic, B. (2000) in his literature, intrapreneurship or corporate entrepreneurship research has evolved into three focal areas. The first area of focus is on the individual intrapreneur (Souder, 1981; Pinchot, 1985; Luchsinger and Bagby, 1987; Ross, 1987; Jennings, Cox and Cooper, 1994), and it mainly emphasizes the intrapreneur’s individual characteristics. Recognition and support of entrepreneurs in organization is also considered. The second area of focus has been on the formation of new corporate ventures (Hlavacek and Thompson, 1973; Copper, 1981; Fast and Pratt, 1981; Hsirich and Peters, 1984; MacMillan, Block and Narasimha, 1984; Szypersky and Klandt, 1984; Vesper, 1984; Burgelman, 1985; Carrier, 1994, Krueger and Brazea, 1994), with a primary emphasis on the differentiation of types of new ventures, their fit with the corporation, and their enabling corporate internal environment. The third area of focus is on the entrepreneurial organization (Hanan, 1976; Quinn, 1979; Schollhammer, 1981; Burgelman, 1983; Kanter, 1984; Drucker, 1985; Pinchot, 1985; Duncan et al., 1988; Rule and Irwin, 1988; Stevenson and Jarillo, 1990; Kuratko et al., 1993; Merrifield, 1993; Stopford and Baden-Duller, 1994; Muzyka, de Konning and Churchill, 1995) that mainly emphasizes characteristics of such organizations.

One of the theories that combine all of the three focal areas above is an “integrative” approach of the entrepreneurial process which is provided by Morris et al (1994). It is presented in Figure 1.0 which includes five concepts of input to the entrepreneurial process and outcomes from the entrepreneurial process. The first key element of inputs that contribute to the process is environmental opportunities which refers to demographic change or the development of a new technology. Next is the individual entrepreneur which is the person who assumes personal responsibility for conceptualizing and

implementing a new venture. The third and fourth elements are organizational context and business concept. To capitalize on the opportunity, the entrepreneur develops some type of business concept and to implement, it requires some type of organizational context which could range from a sole proprietorship to an autonomous business unit within a large corporation. Finally, a wide variety of financial and non-financial resources are required on an ongoing basis. These key elements are then combined over the stages of the entrepreneurial process. Some of the outcomes include a going venture, value creation, new product and service, profit or personal benefit and growth which may or may not happen depending on the types of organization.

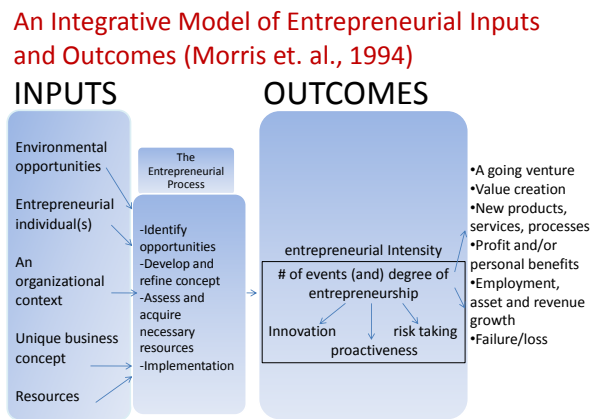
According to Stevenson et al. (1989), in this approach, entrepreneurship has attitudinal and behavioural components. Attitudinally is defined as “the willingness of an individual or organization to embrace new opportunities and take responsibility for affecting creative change.” This willingness is sometimes referred to as an “entrepreneurial orientation”. Behaviourally, it includes the set of activities required to evaluate an opportunity, define a business concept, assess and acquire the necessary resources, and then operate and harvest a venture (Stevenson et al., 1989).

Underlying these are three key dimensions to this which includes innovativeness, risk-taking and proactiveness. Innovativeness refers to the creation of new products, services and technologies. As stated by Morris et al (1994), there are four degrees of innovation as it applies to processes which include major new process, minor new process, significant revision of existing process and modest improvement to existing process. These are referring to processes in companies or firms. The second dimension which is risk-taking refers to the willingness to commit significant resources to opportunities that involve a chance of costly failure. The emphasis is on risks that are moderate and calculated. According to Morris et al, innovativeness and risk taking are related where risk is high when the company ignores new product and service opportunities, and engages in little to no innovation. Companies that do not innovate are faced with higher risk of market and technology shifts that are capitalized on by competitors. But risk is also high when companies take the opposite track, and attempt to come up with breakthrough innovations that create new markets and redefine industries. Risk is lower and more manageable when lots of trials and experiments are regularly pursued. “Proactiveness reflects top management orientation in pursuing enhanced competitiveness, and includes initiative, competitive aggressiveness and boldness” (Morris, 1998: p.26). It is concerned with implementation, with taking responsibility and doing whatever is necessary to bring an entrepreneurial concept to fruition.

These dimensions institute in entrepreneurial orientation which added autonomy and competitive aggressiveness as dimensions (Lumpkin & Dess, 1996). Autonomy refers to self-directed individuals who have the ability to implement their ideas, whereas competitive aggressiveness refers to the way an organization relates to the competition and how they respond to opportunities and threats in the environment (Lumpkin & Dess, 1996). According to Scheepers, M. J. (2006), the popular view held among scholars is that the variable nature of entrepreneurship can be measured in terms of entrepreneurial orientation however Morris and Sexton (1996) regard “entrepreneurial orientation” as a one-dimensional view of the entrepreneurship phenomenon therefore, they have excluded the two dimensions, autonomy and competitive aggressiveness and

added another dimension, namely frequency of entrepreneurship.

According to Morris et al. (1994), to a certain extent an undertaking that demonstrates some amount of any of these dimensions, it can be considered an entrepreneurial event and the person behind it an entrepreneur. Further, any number of entrepreneurial events can be produced in a given time period (Morris et al., 1994). The concept of entrepreneurial intensity is introduced to capture the combined effects of both the frequency (number of entrepreneurial events) and degree of entrepreneurial behaviours (the extent to which such events are innovative, risky and proactive). Importantly, the framework describes the phenomenon of entrepreneurship at both the micro (i.e., the individual entrepreneur or organization) and macro (i.e., the national or global region) levels (Morris et. al., 1994).



**Figure 1.0**

Source: Michael H. Morris, P. Lewis and Donald L. Sexton, “Reconceptualizing Entrepreneurship: An Input-Output Perspective,” *SAM Advanced Management Journal* 59(1) (winter 1994):21-31

This integrative model will be adapted in this study since it focuses in measuring the entrepreneurial intensity of the universities in Malaysia. From previous research, this model has been used in companies and never been used in education institutions as not-for-profit organization. Therefore, in this study, an index questionnaire to measure the entrepreneurial intensity of universities will be designed where the characteristics of entrepreneurial university will be used as independent variables or inputs as in the integrative model.

### **Entrepreneurial University**

#### **Definitions of entrepreneurial university**

There are many definitions of entrepreneurial university found from the past researches that started in the year 1983, however there has not been one definition that can be agreed upon. Some of the definitions given by the researchers are similar but there are also some which contradicts. However almost all the definitions can be related to the three important dimensions of entrepreneurial intensity as in Morris’s Model. According to Etzkowitz (1983), an entrepreneurial university was defined as a “university that is considering new sources of funds like patents, research contracts and entry into a partnership with a private enterprise.” Another term used for entrepreneurial university by Dill (1995) was university technology transfer, and he has defined it as formal efforts to capitalize upon university research by bringing research outcomes to fruition as commercial ventures. Formal efforts are in turn defined as organizational units with explicit responsibility for promoting technology transfer. Another definition given was that the entrepreneurial university involves the creation of new business

ventures by university professors, technicians, or students (Chrisman et. al., 1995). In 2003, Etzkowitz has defined entrepreneurial university as a natural incubator, providing support structures for teachers and students to initiate new ventures: intellectual, commercial and conjoint. From these definitions, we can conclude that entrepreneurial university (EU) involves in research and new business ventures and they can be categorized as innovativeness dimension.

Later, Clark in 1998 has come up with a definition that an entrepreneurial university, on its own, seeks to innovate in how it goes to business. It seeks to work out a substantial shift in organizational character so as to arrive at a more promising posture for the future. Entrepreneurial universities seek to become “stand-up” universities that are significant actors in their own terms. Another definition given was “An entrepreneurial university can mean three things: the university itself, as an organization, becomes entrepreneurial; the members of the university -faculty, students, employees- are turning themselves somehow into entrepreneur; and the interaction of the university with the environment, the “structural coupling” between university and region, follows entrepreneurial pattern” (Ropke, 1998). Both Clark and Ropke definitions covers the dimensions of innovativeness and proactiveness.

Kirby (2002) contended that entrepreneurial universities have the ability to innovate, recognize and create opportunities, work in teams, take risks and respond to challenges. One of the latest researches agreed with Kirby and added, “which seeks to work out a substantial shift in organizational character to arrive at a more promising posture for the future” or “entrepreneurial university is a natural incubator that provides support structures for teachers and students for entrepreneurial initiatives” (Maribel Guerrero Cano, 2007). These two definitions and explanations have covered all the important dimensions stated in Morris’s model which are innovativeness, proactiveness and risk-taking.

#### Theoretical models of entrepreneurial universities

Six main theoretical models of entrepreneurial universities were identified and in each one, there are elements or characteristics associated with the inputs as can be found in Morris’s Input-Output Perspective theoretical framework. Clark suggested the first model in 1998 where he examined five European Universities and recognized issues associated with the entrepreneurial transformation of these universities. According to Clark (1998), for a university to become entrepreneurial, there are five characteristics consisting of a strengthened steering core (organizational context), an enhanced development periphery (environmental opportunities), a diversified funding base (resource), a stimulated academic heartland and an embracing entrepreneurial culture (entrepreneurial individual) during its institutional transformation.

In this study, the characteristics were determined by examining European universities which were established in the late 11<sup>th</sup> and 12<sup>th</sup> centuries as compared to Malaysia, where the local universities were established mainly in the 20<sup>th</sup> century. Therefore, the European universities are not comparable to Malaysian local universities as they have much more experiences and were already very well established even though the education system in Malaysia is dominated by European model.

Another research by Sporn (2001) stated that the characteristics of an entrepreneurial university included elements which are classified into 3 categories. Firstly they are mission, goals, structure, management, governance, leadership and culture (organizational context and entrepreneurial individuals), and the second category is the moderating factors

of the environment and lastly are the networks, conglomerates and strategic alliances (environmental opportunities). All of these elements can be related with the inputs in Morris framework.

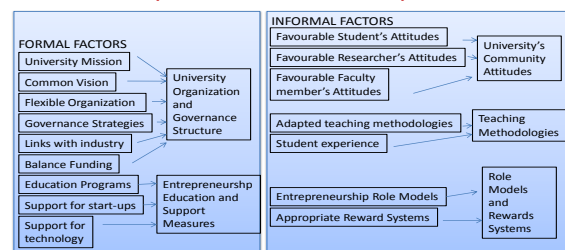
Etzkowitz (2004) has listed a set of five inter-related propositions derived from his analysis of entrepreneurial academic development in the USA, Europe and Latin America which include capitalization of knowledge (resources), interdependence between industry and government, independence from other institutional spheres (environmental opportunities), hybrid organizational forms and institutional renovation (organizational context). In this study, the universities were located in countries with advanced, mature economies as compared to Malaysia which has relatively younger institutions.

Kirby (2006) has categorized seven strategic actions intended to promote an enterprise culture in universities which include endorsement, incorporation, implementation, communication, encouragement and support, recognition and reward and organization promotion. In this study, Kirby has done a case study on the University of Surrey located in the United Kingdom.

Rothaermel et al. (2007) has divided the characteristics into two elements which are internal and external elements. Internal elements (organizational context) include incentive system, university status, location, culture, intermediary agents, university policy, experience, defined role of the faculty, and nature of technology to be commercialized and external elements (environmental opportunities) include public policies, the surrounding industry and regional conditions.

More recently, Maribel Guerrero Cano (2007) has divided the characteristics into two factors, formal and informal factors. The formal factors (organizational context) include University organization and governance structure and Entrepreneurship Education and Support measures whereas the informal factors include University’s community attitudes (entrepreneurial individuals), teaching methodologies (unique business concept) and role models and rewards systems (unique business concept/organizational context). In this study, Cano has done a case study on the University of Barcelona, Spain. It is shown in Figure 1.1.

**Entrepreneurial University Model  
(Cano, M. G., 2007)**



**Figure 1.1: Entrepreneurial university model (Cano, 2007)  
Proposed Conceptual Model**

Based on the literature adapting Morris’s Input-Output Perspective, Figure 2.0 shows the proposed model to analyze the dimensions that affect the creation and development of entrepreneurial universities which will determine the measurements to test the entrepreneurial intensity of universities in Malaysia. As in Table 4 above, the characteristics of entrepreneurial universities can be related to the input in Morris’s model which further shows that this model can be adapted in this study as public universities which are the main

focus are considered as not-for-profit organizations. However, some changes are needed in order to suit the public universities in Malaysian context.

The inputs consist of five characteristics of entrepreneurial university taken from Cano (2007) and these can be grouped following the inputs proposed by Morris as can in Table 5. The outcomes include measuring the entrepreneurial intensity obtained from the three university missions proposed by Etzkowitz (2004) namely that universities should teach, undertake research and commercialize their intellectual property. In this perspective, the universities need to fulfil the three missions concurrently. These missions are teaching, research and entrepreneurial (Etzkowitz, 2004). To do so, entrepreneurial universities need to become entrepreneurial organizations, its members become entrepreneurs and its interaction with the environment need an entrepreneurial pattern (Ropke, 1998).

Furthermore, the measurements or outputs of entrepreneurial intensity for each of the mission are taken from Cano (2007) which can further be categorized under innovativeness, risk-taking and proactiveness as in Table 6. As in Table 2, almost all of the definitions of entrepreneurial university can be linked to innovativeness, while some to proactiveness but the definition that can be linked to all three dimensions, namely innovativeness, proactiveness and risk-taking are Kirby's and Cano's definitions. Hence, this shows that the dimensions of entrepreneurial intensity are not only suitable for organizations involving companies but can also be used in education institutions. According to Scheepers, M. And Hough, J. (2007), autonomy cannot be measured in terms of frequency and it is seen as an antecedent of corporate entrepreneurship, not as part of the degree of entrepreneurship and competitive aggressiveness is viewed as part of the proactiveness dimension since these two dimensions are related. Other researchers support this view (Morris, Allen, Schinehutte & Avilla, 2006; Kreiser et al, 2002). Therefore, this study will only focus on the three key dimensions suggested by Morris et al (1994).

Previous studies demonstrate that this model has never been used to measure the entrepreneurial intensity in the context of education institutions as an organization. For these reasons, in this study, the entrepreneurial intensity model by Morris will be adapted to suit universities as organization and further develop a framework to reveal the actual situation regarding entrepreneurialism in education institutions.

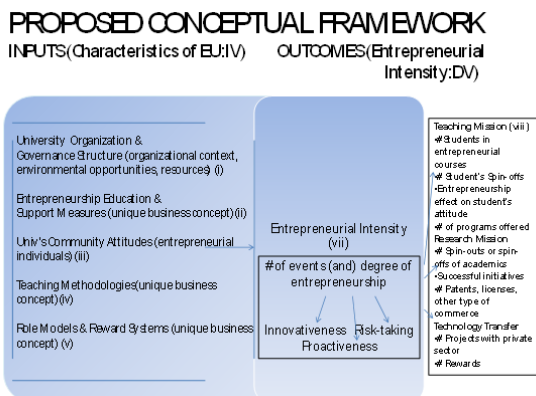


Figure 2.0: Proposed Conceptual Framework

**Methodology Introduction**

The aim of this study is to explore the dimensions of entrepreneurial university and further develop a questionnaire of entrepreneurial intensity of universities in Malaysia. Also, the

local universities in Malaysia will be examined on the entrepreneurial intensity. The methodology used in the study will be both qualitative and quantitative in nature. Qualitative data from interviews with Vice Chancellors of selected public universities in Malaysia will give the researcher an in-depth understanding of the dimensions of entrepreneurial university in Malaysian context. The quantitative data will then be used to provide a more complete picture and to confirm the qualitative data. Once confirmed, a questionnaire will be developed which will be used to examine entrepreneurial intensity of local universities in Malaysia.

**Research Design**

The two methodologies that the researcher will be utilizing in this research comprise both the qualitative and quantitative methodologies, which include interviews and surveys. There are three phases in this study. In Phase 1 and 2, an expert survey method, the Delphi Method where a mixed method strategy or triangulation which combines both qualitative and quantitative will be used. After using the Delphi Method, the information gathered will serve as the basis to develop an index questionnaire, which will consist of a series of characteristics of entrepreneurial university and measurements of entrepreneurial intensity. In Phase 3, the questionnaire will be distributed to all public universities in Malaysia in order to examine the entrepreneurial intensity.

**Phases 1 and 2**

The Delphi Method which is an expert survey is to improve the understanding of and in obtaining insights about the gaps in the literature related to the dimensions of entrepreneurial universities in Malaysia such as the definitions, the requirements and the criteria to measure them.

In Phase 1, interviews will be conducted and the purpose is to acquire an insight into the dimensions of an entrepreneurial university in Malaysian context. This methodology will enable the researcher to obtain a more complete picture of an entrepreneurial university in Malaysia. It involves flexible questioning designed to uncover the dimensions of an entrepreneurial university. The probing procedures that will be used are a set or sequence of questions to identify the definitions, the requirements and the criteria to measure an entrepreneurial university that are used to make judgements based on the underlying ideas. Each question will be posed by the researcher and the respondents will be asked to give an answer and explain their thinking. When an explanation is not clear, further probing questions will be posed. Each session will be recorded and a full transcription will be used for the analysis. The variables and operational definitions gathered in phase 1 will then set off to phase 2.

The information gathered in phase 1 will be used to develop a Likert-scale survey which is sent out to the same participants in phase 1 and additional of other participants. The data collected during phase 2 will be used to further strengthen the variables and the measurements that have been derived from the interviews. There will be a few rounds until consensus are reached. In round 1, the participants will rate them and allow additional new items. In the next round, each participant will receive a Likert-type survey that includes the items and ratings summarized in the previous round and will be asked to revise his/her judgments or to specify the reasons for remaining outside the consensus. This process will continue until consensus reached to generate the dimensions of entrepreneurial university and measurements to identify entrepreneurial intensity of universities in Malaysia. Once the consensus reached, an index questionnaire to measure entrepreneurial intensity of universities

in Malaysia will be developed based on the outcomes from phase 2 and validity and reliability test will be conducted on the questionnaire.

### Phase 3

In phase 3, the questionnaire will be sent out to all public universities. The questionnaire will be divided into a few sections as different sections will acquire different respondents in the universities. From the data collection and analysis, the public universities in Malaysia will be given scores based on the entrepreneurial intensity.

### Population and Sample

The population of this study is public universities in Malaysia. A list of public universities was obtained from the Ministry of Higher Education website. There are 21 public universities in Malaysia as in 2010.

The universities are selected based on purposive sampling which rests "on the assumption that one wants to discover, understand and gain insight on a particular aspect, therefore one needs to select a sample from which one can learn the most" (Merriam, 1988, p. 48). In phase 1, the sample will include University Malaysia Kelantan (UMK) and University of Science Malaysia (USM). UMK has been selected since it claims to be 'The Entrepreneurial University' whereas USM is an APEX university which is prone to commercialize their research.

In phase 2, the sample will include those in phase 1 as well as another three research universities, University of Malaya (UM), National University of Malaysia (UKM) and Universiti Putra Malaysia (UPM). These universities are selected since they are research universities and therefore active in research and prone to commercialize them. Under the Ninth Malaysian Plan, it is stated that each research university will be given an additional allocation of RM153 million for research, development and commercialization activities. The proxies will be the Vice Chancellor and some of the selected panels of experts from the public universities.

In Phase 3, the sample will include all 21 public universities in Malaysia and the proxies will be the staffs from various departments depending on the sections in the questionnaire.

### Potential Outcome

From this study, there will be some differences in the dimensions of entrepreneurial university in Malaysian context as compared to developed countries. Furthermore, the level of entrepreneurial intensity of public universities in Malaysia will show that the research universities will rank higher as compared to other public universities as they have been established much earlier and their main focus is on research and innovation.

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**Table 1: Main definitions of 'intrapreneurship'**

Year	Author	Definition
1984	Burgelman	A concept that is limited to new venture creation within existing organizations
1986, 1983	Baumol, Burgelman	The struggle of large firms to renew themselves by carrying out new combinations of resources that alter the relationships between them and their environments
1991	Zahra	The process of creating new business within established firms to improve organizational profitability and enhance a firm's competitive position or the strategic renewal of existing business
1984	Burgelman	A process of "extending the firm's domain of competence and corresponding opportunity set through internally generated new resource combinations"
1989	Sathe	Process of organizational renewal
1983	Miller	Embodies renewal activities that enhance a firm's ability to compete and take risks