Project Code :
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UNIVERSITI SAINS MALAYSIA

RU GRANT
FINAL REPORT FORM

Please email a softcopy of this report to rcmo@usm.my

A	**PROJECT DETAILS**
i	**Title of Research:** **Creating an Entrepreneurial Ecosphere within Higher Education Institutions: Towards a Model of Entrepreneurial University**
ii	**Account Number:** 1001/PMGT/816222
iii	**Name of Research Leader:** Assoc Prof Noor Hazlina Ahmad
iv	**Name of Co-Researcher:** 1. Assoc Prof Dr Hasliza Abdul Halim 2. Prof T Ramayah 3.
v	**Duration of this research:** a) **Start Date** : 15/12/2012 b) **Completion Date** : 14/12/2014 c) **Duration** : 2 years 6 months d) **Revised Date** (*if any*) : 30/6/2015
B	**ABSTRACT OF RESEARCH**
	(An abstract of between 100 and 200 words must be prepared in Bahasa Malaysia and in English. This abstract will be included in the Report of the Research and Innovation Section at a later date as a means of presenting the project findings of the researcher/s to the University and the community at large) The ASEAN countries are progressing with tremendous opportunities and scopes emphasizing on the knowledge economy. Such attempt has invigorated to find new avenues of implementing the concept of entrepreneurial university. The main purpose of the study is to distinguish the Malaysian universities which possess hard and soft elements of the entrepreneurial university. Further, the study attempted to explore the possible significant differences in context of the dimensions of entrepreneurial orientation within the entrepreneurial university paradigm. Data were collected from the 536 faculty members of the Malaysian universities and an independent sample t-test was conducted to identify the group differences. The result has indicated that significant differences exist between the universities which embrace hard and soft elements of the entrepreneurial university concept. The study will assist the educationist and policy makers to way forward the concept of entrepreneurial university and become a hub for the innovation and regional development.

C BUDGET & EXPENDITURE

i

Total Approved Budget : RM 145,416.00

Yearly Budget Distributed

Year 1 : RM 63998.00
Year 2 : RM 81418.00
Year 3 : RM -

Total Expenditure : RM 13,7297.40

Balance : RM 8118.60

Percentage of Amount Spent (%) : 94.4%

 # Please attach final account statement (eStatement) to indicate the project expenditure

ii **Equipment Purchased Under Vot 35000**

No.	Name of Equipment	Amount (RM)	Location	Status
	NIL	NIL	NIL	

 # Please attach the Asset/Inventory Return Form (Borang Penyerahan Aset/Inventori) – Appendix 1

D RESEARCH ACHIEVEMENTS

i **Project Objectives** *(as stated/approved in the project proposal)*

No.	Project Objectives	Achievement
1	3 journal publications	Achieved (3 published, 1 under review)
2	2 conferences	Achieved (1 proceedings and 1 presentation in which the paper has been published in a journal article)
3	1 Phd student	The candidate is now finalising her chapter 4 and 5)
4		
5		
6		

ii. **Research Output**

a) Publications in ISI Web of Science/Scopus

No.	Publication (authors,title,journal,year,volume,pages,etc.)	Status of Publication (published/accepted/ under review)
1.	Noor Hazlina Ahmad, Hasliza Abdul Halim, T Ramayah (accepted, 2015). Dilemma towards an Entrepreneurial University Ideal: The Prevailing Academic Tensions. *Croatian Journal of Education* [ISI Indexed Impact Factor 0.034] ISSN: 1848-5197	Accepted. In Press
2.	Noor Hazlina Ahmad, Hasliza Abdul Halim, T Ramayah, Syed Abidur Rahman (under review, 2015). The Quest towards an Entrepreneurial University Paradigm: Evidence from an Emerging Economy. The Asia-Pacific Education Researcher. [ISI Indexed]	Under Review

b) Publications in Other Journals

No.	Publication (authors,title,journal,year,volume,pages,etc.)	Status of Publication (published/accepted/ under review)
1	Noor Hazlina Ahmad, Hasliza Abdul Halim, T Ramayah, Syed Abidur Rahman. (2013). Revealing an open secret: Internal challenges in creating an entrepreneurial university from the lens of the academics. International Journal of Conceptions on Management and Social Sciences, 1 (1), 30-33.	Published

c) Other Publications
(book,chapters in book,monograph,magazine,etc.)

No.	Publication (authors,title,journal,year,volume,pages,etc.)	Status of Publication (published/accepted/ under review)
1	Noor Hazlina Ahmad, Hasliza Abdul Halim, T. Ramayah, Syed Abidur Rahman. (2014). Leading an Entrepreneurial University: Do We Have the Right Ecosystem? *Handbook on Business Strategy and Social Sciences,* 65-73, ISBN: 978-969-9952-00-5	Published

d) Conference Proceeding

No.	Conference (conference name,date,place)	Title of Abstract/Article	Level (International/National)
1	16th Global Academy of Business and Economics Research International Conference New York, USA, May 7-8, 2015	The Quest towards an Entrepreneurial University Paradigm: Evidence from an Emerging Economy.	International

	# Please attach a full copy of the publication/proceeding listed above
iii	**Other Research Ouput/Impact From This Project** *(patent, products, awards, copyright, external grant, networking, etc.)*

E HUMAN CAPITAL DEVELOPMENT

a) Graduated Human Capital

Student	Nationality (No.)		Name
	National	International	
PhD			1. 2.
MSc			1. 2.
Undergraduate			1. 2.

b) On-going Human Capital

Student	Nationality (No.)		Name
	National	International	
PhD	1		1. Asliza Mohd Yusoff (finalising chapter 5) 2.
MSc			1. 2.
Undergraduate			1. 2.

c) Others Human Capital

Student	Nationality (No.)		Name
	National	International	
Post Doctoral Fellow			1. 2.
Research Officer			1. 2.
Research Assistant	1		1. Haniruzila bt Md Hanifah 2.
Others (GRA)		1	1. Syed Abidur Rahman (graduated 2015 - Phd)

F COMPREHENSIVE TECHNICAL REPORT

Applicants are required to prepare a comprehensive technical report explaining the project. The following format should be used (this report must be attached separately):

- Introduction
- Objectives

	• Methods • Results • Discussion • Conclusion and Suggestion • Acknowledgements • References

G	PROBLEMS/CONSTRAINTS/CHALLENGES IF ANY
	(Please provide issues arising from the project and how they were resolved) Getting sufficient data to enrich the study. However, eventually the study managed to obtain 536 responses from 15 universities in Malaysia

H	RECOMMENDATION
	(Please provide recommendations that can be used to improve the delivery of information, grant management, guidelines and policy, etc.)

Project Leader's Signature:

.....

Name : Assoc. Prof. Dr. Noor Hazlina Ahmad
School of Management
Universiti Sains Malaysia

Date : 7/1/2016

I	COMMENTS, IF ANY/ENDORSEMENT BY PTJ'S RESEARCH COMMITTEE

Supported

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Dr. Hooy Chee Wooi
Associate Professor
School of Management
Universiti Sains Malaysia
11800 USM, Penang

School Of Management
Universiti Sains Malaysia

.....

Signature and Stamp of Chairperson of PTJ's Evaluation Committee

Name : HOOY CHEE WOOI

Date : 7/1/2016

PROFESOR FAUZIAH MD TAIB
DEKAN
PUSAT PENGAJIAN PENGURUSAN
UNIVERSITI SAINS MALAYSIA

Pusat Pengajian Pengurusan
Universiti Sains Malaysia

.....

Signature and Stamp of Dean/ Director of PTJ

Name :

Date : 7/1/16

UNIVERSITI SAINS MALAYSIA

RU GRANT
FINAL REPORT CHECKLIST

Please use this checklist to self-assess your report before submitting to RCMO.
Checklist should accompany the report.

NO.	ITEM	PLEASE CHECK (✓)		
		PI	JKPTJ	RCMO
1	Completed Final Report Form	✓		
2	Project Financial Account Statement (e-Statement)	✓		
3	Asset/Inventory Return Form *(Borang Penyerahan Aset/Inventori)*	Not applicable		
4	A copy of the publications/proceedings listed in Section D(ii) (Research Output)	✓		
5	Comprehensive Technical Report	✓		
6	Other supporting documents, if any	Not applicable		
7	Project Leader's Signature	✓		
8	Endorsement of PTJ's Evaluation Committee	✓		
9	Endorsement of Dean/ Director of PTJ's	✓		

The Asia-Pacific Education Researcher

The Quest towards an Entrepreneurial University Paradigm: Evidence from Malaysia

--Manuscript Draft--

Manuscript Number:	TAPE-D-15-00443
Full Title:	The Quest towards an Entrepreneurial University Paradigm: Evidence from Malaysia
Article Type:	Regular Article
Keywords:	Entrepreneurial University; Entrepreneurial Orientation; Academic; Challenges.
Funding Information:	Institute of Postgraduate Studies, Universiti Sains Malaysia (1001/PMGT/816222) Dr. Noor Hazlina Ahmad
Abstract:	The ASEAN countries are progressing with tremendous opportunities and scopes emphasizing on the knowledge economy. Such attempt has invigorated to find new avenues of implementing the concept of entrepreneurial university. The main purpose of the study is to distinguish the Malaysian universities which possess hard and soft elements of the entrepreneurial university. Further, the study attempted to explore the possible significant differences in context of the dimensions of entrepreneurial orientation within the entrepreneurial university paradigm. Data were collected from the 536 faculty members of the Malaysian universities and an independent sample t-test was conducted to identify the group differences. The result has indicated that significant differences exist between the universities which embrace hard and soft elements of the entrepreneurial university concept. The study will assist the educationist and policy makers to way forward the concept of entrepreneurial university and become a hub for the innovation and regional development.
Corresponding Author:	Noor Hazlina Ahmad Universiti Sains Malaysia Pulau Penang, MALAYSIA
Corresponding Author Secondary Information:	
Corresponding Author's Institution:	Universiti Sains Malaysia
Corresponding Author's Secondary Institution:	
First Author:	Noor Hazlina Ahmad
First Author Secondary Information:	
Order of Authors:	Noor Hazlina Ahmad Hasliza Abdul Halim, PhD Syed Abidur Rahman, PhD T Ramayah
Order of Authors Secondary Information:	
Author Comments:	Thank you.
Suggested Reviewers:	Carlene Wilson Flinders University carlene.wilson@flinders.edu.au expert Pi-Shen Seet Flinders University pi-shen.seet@flinders.edu.au expert Ali Quazi University of Canberra

The Quest towards an Entrepreneurial University Paradigm: Evidence from Malaysia

Highlights:

- The main purpose of the study is to distinguish the Malaysian universities which possess hard and soft elements of the entrepreneurial university.
- Further, the study attempted to explore the possible significant differences in context of the dimensions of entrepreneurial orientation within the entrepreneurial university paradigm.
- Data were collected from the 536 faculty members of the Malaysian universities and an independent sample t-test was conducted to identify the group differences.
- The result has indicated that significant differences exist between the universities which embrace hard and soft elements of the entrepreneurial university concept.
- The study will assist the educationist and policy makers to way forward the concept of entrepreneurial university and become a hub for the innovation and regional development.

The Quest towards an Entrepreneurial University Paradigm: Evidence from an Emerging Economy

Noor Hazlina Ahmad PhD[1]
School of Management
Universiti Sains Malaysia
11800 Penang, Malaysia
Tel: +60 4653 3878; Fax: +60 4653 3130
Email: hazlina@usm.my

Hasliza Abdul Halim PhD, Syed Abidur Rahman, T Ramayah
School of Management
Universiti Sains Malaysia
11800 Penang, Malaysia
Tel: +60 4653 5162; Fax: +60 4653 3130
Email: haslizahalim@usm.my, syedabid728@gmail.com, ramayah@usm.my;

Noor Hazlina Ahmad Ph.D. is an Associate Professor of school of management in Universiti Sains Malysia. Her research interests are Entrepreneurship and SMEs, Entrepreneurial Competencies, Cross Cultural Study and Organizational Behavior. She has published her research works in several international journals which include Journal of Business Ethics, International Journal of Entrepreneurial Venturing

Hasliza Abdul Halim, Ph.D. is a senior lecturer at the School of Management, University Sains Malaysia. She has presented her research works at various international conferences including the Australia and New Zealand Academy of Management. Additionally she also published in various journals including Journal of Human Resource Costing & Accounting, Singapore Management Reviews.

Syed Abidur Rahman, is a PhD candidate in the area of sustainable development and entrepreneurship in Universiti Sains Malaysia. By profession, as a faculty member (Assistant Professor), serving the business administration department of Stamford University Bangladesh. His area of interest is base of pyramid, entrepreneruship, sustainable development.

T. Ramayah is currently a Professor at the School of Management in USM. He teaches mainly courses in Research Methodology and Business Statistics. Apart from teaching, he is an avid researcher, especially in the areas of technology management and adoption in business and education. His publications have appeared in Computers in Human Behavior, Resources Conservation and Recycling, Journal of Educational Technology & Society.

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[1] Corresponding Author

The Quest towards an Entrepreneurial University Paradigm: Evidence from Malaysia

Abstract

The ASEAN countries are progressing with tremendous opportunities and scopes emphasizing on the knowledge economy. Such attempt has invigorated to find new avenues of implementing the concept of entrepreneurial university. The main purpose of the study is to distinguish the Malaysian universities which possess hard and soft elements of the entrepreneurial university. Further, the study attempted to explore the possible significant differences in context of the dimensions of entrepreneurial orientation within the entrepreneurial university paradigm. Data were collected from the 536 faculty members of the Malaysian universities and an independent sample t-test was conducted to identify the group differences. The result has indicated that significant differences exist between the universities which embrace hard and soft elements of the entrepreneurial university concept. The study will assist the educationist and policy makers to way forward the concept of entrepreneurial university and become a hub for the innovation and regional development.

Keywords: Entrepreneurial University, Entrepreneurial Orientation, Academic, Challenges.
Field: Entrepreneurship

1. Introduction

The Association of South East Asian Nations (ASEAN) comprises of most dynamic and emerging knowledge economies in the Asian region, and to an extent in the world. The ASEAN countries have showed a remarkable resilience after the hard hit by the Asian financial crisis during 1990s (Irawati & Rutten, 2013). One of the drivers for the progression of these economies presumed to be the knowledge economy. However, the matter of fact is the awareness of knowledge based economy has begun less than a decade ago in this region (Afzal & Lawrey, 2012). Malaysia is one of the members of ASEAN, which has decided to transform and build its advancement path with the effort of the knowledge based economy rather than in-put driven economy (Goh, 2005). The researchers have opined and envisioned to strengthen the knowledge based economy with the preferment of entrepreneurial university (Bercovitz & Feldman, 2006). Entrepreneurial university is seen as a viable mechanism to promote knowledge and innovation given the focus on entrepreneurial activities which encompasses and extends the research university (Ahmad, Halim, Ramayah, & Rahman, 2013; Etzkowitz, Webster, Gebhardt, & Terra, 2000). The traditional mission of the university was knowledge transfer and advancement of the knowledge through basic research. Together with teaching and research, the entrepreneurial university adopts the third mission of contributing to economic development (Philpott, Dooley, O'Reilly, & Lupton, 2011). Recently, the notion of entrepreneurial university has been considered as one of the reasonable approach for the socio-economic development, particularly deliberated as an isomorphic developmental path (Etzkowitz et al., 2000) which will reduce governmental expenditure. Being into this insight, governments around the world are pushing universities to embrace the paradigm of entrepreneurial university and Malaysia is no exception of it. However, leaning towards government's aspiration, some of the university managements are shifting from a long-established organic approach towards a more interventionist top- down push approach (Gibb, Haskins, & Robertson, 2013; Philpott et al., 2011). Though, this shift by the university towards this third mission is contended by few academic disciplines as a peril to the main purpose of a university which is, teaching and research (Philpott et al., 2011). Furthermore, scholars assert entrepreneurial university as a twist of the purpose of the research university (Slaughter, 2004). In such contradictory stand, it is important to understand the state of the entrepreneurial university concept among the Malaysian public and non-public universities. The extant researches suggest containing some elements of entrepreneurial university. Based on the extensive literature, this study has classified the comprised elements of entrepreneurial universities in to hard and soft elements. Presence of hard elements signifies more orientation towards entrepreneurial university and vise-versa. Therefore, the main objective of this study is to identify the difference of the entrepreneurial university initiatives among the two types of classifications. In doing so, an empirical research attempt has been taken through structured questionnaires. The findings of the empirical analysis will assist academicians and policy makers to get a clear picture on the state of entrepreneurial university in the Malaysian context. Further, the result derived from this study, will facilitate to incorporate required issues which needed to take into account by the government and the university authorities.

2. Literature Review

Scholars have termed the rise of entrepreneurial university as a second academic revolution (Etzkowitz, 2014). The advent of the 'entrepreneurial university' brings out twofold obligation for the higher educational institution, to produce new knowledge and also to adjust its activities and values in such a way that can assist the transfer of technology and knowledge spillovers (Audretsch, 2014). The effort to become an entrepreneurial university has also been acknowledged as to make a difference as part of the big society (Taylor, 2014). In this regard, scholars have argued that entrepreneurial university will enable to transferal of knowledge and technology across the industry, develop industrial park, regional and local engagement, creation of public value etc. (Gibb et al., 2013) and presumed to open financial benefit to the universities and its faculties (Phan & Siegel, 2006). It has been argued that to align the universities with the entrepreneurial university mindset, transfer of technology in collaboration with the industry is rather an important issue to be considered (Ernest, Matthew, & Samuel, 2015). In this regard, scholars have already acknowledged the importance to have a strong and effective leadership, which will enable the transformation towards an entrepreneurial university (Yusof & Sapuan, 2008). Despite successful materialization of entrepreneurial university in many contexts, the controversies still are droning around it. Scholars are constantly putting cautions over the implementation of entrepreneurial university as it is instigating the ethos of commercialism and 'for-profit' motive among the young researchers (Lam, 2015). Past literatures have indicated that in the developed countries the concept of entrepreneurial university encountered few impediments, which is known as European Paradox (Dosi, Llerena, & Sylos Labini, 2005). This paradox has been attributed to: (a) lack of entrepreneurial spirit among scientists; (b) poor intellectual property rights to university inventions; (c) differing legal systems between nations that inhibit cross border technology transfer. In general there are other internal and external factors which limit the materialization of entrepreneurial university. Major internal factors include limited time due to classes or administrative work; limited financial resources; lack of infrastructure; delay in fund management; and lack of skilled personnel. In addition to that major external factors are: increasing capital costs; inadequate government funds; difficulty in private sector collaboration; dearth of expert research and development personnel; lack of supplementary services to support research and development (Yusof & Sapuan, 2008). These challenges can be context as general challenges in developed and developing countries. As according to Hussler, Picard, and Tang (2010), contextual difference may lead to mount more challenges towards entrepreneurial university.

In the context of entrepreneurial university scholars have suggested to consider research mobilization, unconventionality, industry collaboration, university policies as the dimensions which explain the entrepreneurial orientation of an entrepreneurial university (William Todorovic, McNaughton, & Guild, 2011). However, in addition, it is also important to consider the academic issue in context of the entrepreneurial university.

Mobilization denotes the shift of conventional knowledge management en route for a system that provisions knowledge formation and innovation at individual or organizational level (Hasan & Crawford, 2007). However, according to, William Todorovic et al. (2011) research mobilization insinuates the engagement of external stakeholders at all stages, explicitly on the research outcomes which can be easily understandable and transferable to the concerned stakeholders. Research mobilisation perhaps can be seen under the concept of knowledge mobilisation

(William Todorovic et al., 2011) which targets to support the generation, partaking, integration and applied application of the most effective knowledge available to progress the outcomes that are the intention of the organisation (Lowry, 2014).

Unconventionality indicates the magnitude of searching for new opportunities which are useful and beneficial for the stakeholders (William Todorovic et al., 2011). In the literatures of entrepreneurial university, trailing forward for new opportunities have also been considered as platform which opens up the horizon of possible outcome facilitating the conversion of the conventional knowledge to the innovative activities (D'Este & Perkmann, 2011). According to Riviezzo and Napolitano (2013), unconventionality signifies the aptitude to ascertain new opportunities other than conventional academic environment, emphasizing more on eccentric approaches in research funding, problem solving, relationships with external organizations.

Industry collaboration considers the degree of cooperation with industry at individual and organizational levels (Riviezzo & Napolitano, 2013). More specifically, William Todorovic et al. (2011) outlined that presence of industry collaboration drive department, faculty, and student to be engaged with the related industry (William Todorovic et al., 2011). It has purported that entrepreneurial universities are gradually appearing more as proactive managers of the collaboration with industry, pursuing to create valuable Intellectual Property (IP) to promote technology transfer (Bruneel, d'Este, & Salter, 2010). According to D'Este and Perkmann (2011), collaboration with industry provides a leverage to the entrepreneurial university in order to endorse and inspire entrepreneurial activities among the researchers in the university.

University policies indicates the insight of the department head regarding the central university policies and the extent to which they face possible impediments or enable the departments in their innovative and unconventional actions (Riviezzo & Napolitano, 2013). In the same line, William Todorovic et al. (2011) have indicated that university policies symbolize the departmental perception on the initiatives of university policy and objective with regard to the recognition of innovative ideas.

An important dimension need to be considered for the entrepreneurial orientation is 'Academic' in context of entrepreneurial university. Incorporating entrepreneurship courses at the university level for the students and encouraging them to participate in the entrepreneurship related activities is an important aspect. While vowing for entrepreneurial university concept, Gibb et al. (2013) and Gibb and Hannon (2006), suggested to include entrepreneurship course in the student's curriculum, innovative pedagogical support for departments, along with active participation of students in the entrepreneurial activities.

Being a member of ASEAN, Malaysia is investing more in research and development. However, Yusof and Sapuan (2008) put cautious that there are challenges to academic leaders in nurturing entrepreneurial university in Malaysia. Among the Malaysian entrepreneurial universities, there are numerous issues and challenges. The important issues exist for creating entrepreneurial university is, attracting fund from the private sector and willingness of private sectors to pour expenditure into universities for research. Along with these, other possible challenges are: standing up to local role along with gearing up international role; addressing conflict between the role of disciplines and the role of inter-disciplines; addressing the conflict between academic

freedom, deciding between centralized versus decentralized management of the university-industry boundary; selecting the appropriate commercialization model for technology transfer offices (Yusof & Sapuan, 2008).

3. Methodology

The current study attempted to explore deeper insight into the views towards the dimensions of entrepreneurial orientation and academic dimension of the two types of entrepreneurial universities which possess extent of hard and soft elements of entrepreneurial university. There were total nine hard elements and sixteen soft elements. If, either one of the nine/sixteen elements were found in the responses, the responses categorized to be in the group of hard/soft entrepreneurial university. The empirical survey was conducted on faculty members of both public and non-public universities in Malaysia. The measurement was adopted from William Todorovic et al. (2011). A total 536 usable responses were used in the study for analysis of which, 305 responses were from the universities which contains either one of the nine hard elements and 231 responses from the universities which contains either one of the soft elements of entrepreneurial university. Based on the two groups, the study performed independent sample t-test to reveal the differences on the variables of entrepreneurial orientation. The independent sample t-test was carried out with statistical package SPSS version 21. The following are the elements of hard and soft core entrepreneurial university (Table 1).

Table 1: Elements of entrepreneurial university

Type of Elements	**Elements**
Soft	• Strategic vision statement on entrepreneurship • Entrepreneurship academic division • Entrepreneurship as subject • Entrepreneurship integrated in core requirements • Entrepreneurship courses for non-business majors • Ongoing curriculum innovation, development of innovative pedagogies and teaching • Student-led entrepreneurship initiatives • Alumni incorporated as speakers and guest academics • Consultancy-directly selling academic expertise to external organizations • Extension education focusing on corporate/social/family entrepreneurship • Entrepreneurship research center with funded research program • Large-scale research grants from external sources • Entrepreneurship activities center • Networking events for entrepreneurs • Entrepreneurship student club(s) • Business plan competition
Hard	• Patenting and Licensing • Links to successful entrepreneurs, business angels, and venture funds • Business incubator

- Science or technology parks
- Spin-off firms formation
- Technology transfer office
- Entrepreneurship endowed chair
- Innovation and commercialization office

4. Findings

4.1 Descriptive Statistics of Key Variables

As shown in Table 2, the mean values of all the variables found to be above the midpoint 2.50. Industry Collaboration scored the highest with a mean value of 3.90, followed by Research mobilization (3.81). The dispersion values reported through standard deviation indicates that the dispersion values were less than 1 in all the study variables. 'University policies' has the highest value of standard deviation (0.746) in the study while Research mobilization holds the lowest standard deviation with the value of 0.606.

Table 2: Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Research Mobilization	536	1.00	5.00	3.81	0.606
Unconventionality	536	1.00	5.00	3.75	0.607
Industry Collaboration	536	1.00	5.00	3.90	0.610
University Policies	536	1.00	5.00	3.69	0.746
Academic	536	1.00	5.00	3.73	0.701
Challenges	536	1.40	5.00	3.67	0.665

4.2 Independent Sample t-test

An Independent sample t-test was conducted to determine the possibility of significant differences between the hard and soft elements of entrepreneurial university. The result indicates that there were statistically significant mean difference in 5 out of 6 constructs in the context of the study variables where $p<0.01$ (refer to Table 3).

Table 3: Independent Sample t-test

Variables	Mean	Std. Deviation	t value	Sig
Research Mobilization	3.92[a]	0.546	5.01	0.000**
	3.66[b]	0.649		
Unconventionality	3.90	0.534	6.85	0.000**
	3.55	0.641		
Industry Collaboration	4.02	0.569	5.67	0.000**

	3.73	0.623		
University Policies	3.79	0.693	3.55	0.000**
	3.56	0.793		
Academic	3.77	0.721	1.62	0.106
	3.67	0.670		
Challenges	3.61	0.689	2.35	0.019**
	3.75	0.621		

Note: Upper row 'a' denotes hard elements and lower row 'b' denotes soft elements of entrepreneurial university
**denotes significant at $p<0.01$

4.3 Internal Challenges towards Entrepreneurial University Agenda

This study also explores the challenges faced by the academicians in adopting the entrepreneurial university agenda. As shown in Table 4, the biggest constraint faced by the academicians is pertaining to the workload. Apparently, the academicians felt that the requirements of an entrepreneurial university (that is mainly to generate income) posed a lot of burden in terms of managing the time especially in terms of teaching, researching, and generating income to the university.

Table 4: Internal challenges

Challenges of entrepreneurial university	**Mean**	**Std. Deviation**
Workload constrains	4.03	0.849
Absence of entrepreneurial role model	3.65	0.898
Unattractive incentive mechanism	3.76	0.923
Absence of a unified entrepreneurial culture	3.74	0.917
Adverse impact on academic career progression	3.59	0.900
Current promotional system	3.56	0.953
Absence of expert in entrepreneurship	3.54	1.008
Lack of flexibility within the university structure	3.50	1.030
Lack of autonomy to reconfigure the university	3.50	0.959
Funding is limited	3.80	1.023

The respondents also reported other forms of challenges that could be categorised into several themes namely; (1) Academic resistance, (2) Structural issues, (3) Leadership challenges, (4) entrepreneurial culture issues, (5) social capital issues. The descriptions of challenges are depicted in Table 5.

Table 5: Other Challenges

Challenges	**Description**
Academic resistance	• Attitude and mind-set change is another big challenge • Balance between the teaching hours and research activities • Heavy workload
Structural issues	• Bureaucracy • Delay in the research fund

	• Lack of research grant for product/services/ practice oriented research • Lack of funding to promote research culture, it is just a more teaching and learning institute
Leadership Challenges	• Head of department/top management/ dean's attitude toward creating entrepreneurial university. • insufficient strategies to support new initiatives • Required policy with global accepted goal • Intelligent properties (IP) issue.
Entrepreneurial culture issues	• Resistance to new ideas and lack tolerance among academician • Lack of entrepreneurial motivation • Lack of guidance for students to inculcate entrepreneurial culture • Negative perception and mentality of certain people on entrepreneurship.
Social capital issue	• Linkage and collaboration with local industries and institutional partnership with foreign universities • Reluctance to be involved with industry due to very short deadline of period to complete a project. • Lacks international university collaboration

5. Discussion and Conclusion

The study was conducted among the faculty members from 15 public and non-public universities in Malaysia. Empirical study has classified the responses into two major categories highlighting the hard and soft core of entrepreneurial university activities. The study revealed that there is significant difference among the two types of entrepreneurial universities in context of research mobilization, unconventionality, industry collaboration, university policies, and challenges. While, in terms of academic, there is no significant difference between the two groups. Those who have hard elements of entrepreneurial university, significantly differs in these dimensions compared to those who have soft element of entrepreneurial university.

A significant difference has been revealed in context of research mobilization among the hard and soft type of entrepreneurial university. Encouraging students to seek practical applications for their research is one of the most important symbolic factors of the entrepreneurial university which possess the hard elements. The universities which contain the hard elements of entrepreneurial university are more likely to engage in research mobilization through encouraging students in the research which has implications on the industry. While the faculty members seek research opportunities outside the traditional university environment, it is considered to contain the hard elements of the entrepreneurial university. Further, the faculty members in general compliment the attempt of the university at identifying new opportunities. In addition state of the industry collaboration is an important issue for the entrepreneurial university which comprises of hard elements. In view of the industry collaboration, faculty members of the entrepreneurial university believe that their own university should build relationships with private or public sector organization. It is presumed that it would make the institution more inclined towards the notion of entrepreneurial university. University policies for being an entrepreneurial university are a major issue. University-wide policies at the university contribute

significantly towards the university accomplishing its goals and objectives. Entrepreneurial university should be very much responsive to any kind of new ideas and innovative approaches it order to be vibrant entrepreneurial university. It can be asserted that research mobilization, unconventionality, industry collaboration, university policies drives the university to be more entrepreneurial in nature. Especially these features allows the universities to institute the patenting and licensing, linking successful entrepreneurs and ventures, business and student incubator, science or technology parks, technology transfer office. However, academic dimension found to have similarity in both hard and soft type of entrepreneurial university. Irrespective of the nature, whether hard or soft, all the universities in the study found to provide emphasize on the entrepreneurship as subject in the curriculum. All the universities in Malaysia in general tend to encourage the student to participate in the entrepreneurship activities. In fact, incorporating the entrepreneurship course in the study syllabus does not confirm the state of entrepreneurial university. The notion of the current probe is, entrepreneurial university should comprise of issues which are more policy oriented and need to accomplish with wider perspective. However, the challenges to be the entrepreneurial university found to be same across all the universities in Malaysia. As a typical approach of the university, all the universities are burdened with workload. Perhaps this is one of the most significant impediments to be entrepreneurial university. Further, it is asserted that in the Malaysian universities limitation of funding is also another issue which should be considered as constraints towards entrepreneurial university. Nevertheless, there are some other challenges such as, academic resistance, structural issues, leadership challenges, entrepreneurial culture issues, and social capital issues. It is expected that if the challenges are addressed properly to the concerned authorities and the impediments are sorted out in a well-managed manner, it is expected that universities can be more entrepreneurial oriented.

It has been stated at the outset that ASEAN region is investing greater extent towards building a knowledge economy which would be ultimate developmental approach of all the member countries. It is believed that to sustain and progress it is important to accentuate the knowledge which can be collaborated with the industry. This is an approach which perhaps opens up the scope of the entrepreneurial university. In context of Malaysia, bearing some great challenges, it is anticipated that progression of the entrepreneurial university is satisfactory. However, it is still important to institute the entrepreneurial mindset among the faculty members, researchers, and students to more extent. In addition, through required financial support for research and development, universities can progress ahead towards being a full-fledged entrepreneurial university. It is not so far, embracing such practices not only in Malaysia, the ASEAN region could become a center of the world in terms of entrepreneurial university.

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AUTHORS

Name	Noor Hazlina Ahmad
Affiliation	School of Management Universiti Sains Malaysia 11800 Penang Malaysia
Country	Malaysia
Bio statement	—

Principal contact for editorial correspondence.

Name	Hasliza Abdul Halim
Affiliation	School of Management Universiti Sains Malaysia 11800 Penang Malaysia
Country	Malaysia
Bio statement	—

Name	T Ramayah
Affiliation	School of Management Universiti Sains Malaysia

Country Malaysia
Bio statement —

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The fact that universities have become complex organisations characterised by multiple missions including teaching, research, and entrepreneurship agenda served as a starting point for this enquiry. This study strives to offer deeper insight into the views of the academics pertaining to the creation of an entrepreneurial university ideal within the context of a research university. The underlying complexities in achieving this mission were extracted from a series of semi-structured interviews conducted among academicians spanning the diverse disciplines within the university. The findings revealed a vast array of definitions given to the concept of an entrepreneurial university that ranges from the soft spectrum to the hard spectrum of entrepreneurial activities. This study adds value to the existing literature through the identification of dilemmas surrounding the creation of the entrepreneurial university that encompass challenges related to the academic resistance, internal factors and social capital issues. It is concluded that the right balancing between teaching, research and entrepreneurship is crucial to ensure that learning institutions do not digress from their core functions. Effective linkages between university-industry–government could assist to fast-track the transition from the traditional university to the entrepreneurial university concept.

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Dilemma towards an Entrepreneurial University Ideal: The Prevailing Academic Tensions

Noor Hazlina Ahmad[1]
School of Management
Universiti Sains Malaysia
11800 Penang, Malaysia
Tel: +60 4653 3878; Fax: +60 4653 3130
Email: hazlina@usm.my

Hasliza Abdul Halim and T. Ramayah
School of Management
Universiti Sains Malaysia
11800 Penang, Malaysia
Tel: +60 4653 5162; Fax: +60 4653 3130
Email: haslizahalim@usm.my; ramayah@usm.my

Abstract

The fact that universities have become complex organisations characterised by multiple missions including teaching, research, and entrepreneurship agenda served as a starting point for this enquiry. This study strives to offer deeper insight into the views of the academics pertaining to the creation of an entrepreneurial university ideal within the context of a research university. The underlying complexities in achieving this mission were extracted from a series of semi-structured interviews conducted among academicians spanning the diverse disciplines within the university. The findings revealed a vast array of definitions given to the concept of an entrepreneurial university that ranges from the soft spectrum to the hard spectrum of entrepreneurial activities. This study adds value to the existing literature through the identification of dilemmas surrounding the creation of the entrepreneurial university that encompass challenges related to the academic resistance, internal factors and social capital issues. It is concluded that the right balancing between teaching, research and entrepreneurship is crucial to ensure that learning institutions do not digress from their core functions. Effective linkages between university-industry–government could assist to fast-track the transition from the traditional university to the entrepreneurial university concept.

Keywords: entrepreneurial university; university-industry linkage; academic entrepreneurship

[1] Corresponding Author

Introduction: Universities in Flux

The higher education institutions have entered a phase of disquieting changes; pulled and pushed by a growing array of internal and external demands. Government expect universities to embrace entrepreneurial posture in solving economic and social problems given that universities are the storehouse of knowledge and wisdom. Entrepreneurial university has now become the "new normal" within higher education institutions (HEIs) landscape where entrepreneurship, innovation and commercialisation are the new buzzword. Within this context, entrepreneurial universities are required to undertake one other mission—apart from teaching and research—that is knowledge transfer and commercialisation activities for income generation. Universities are also encouraged to promote entrepreneurship among students and academics as well as to embed entrepreneurial thinking and practices within curriculum, co-curriculum and research activities. In real sense, local higher education institution scene is in flux.

Universities are urged to play a larger and enhanced role in contributing to international competitiveness of economies that could contribute to local and regional economic growth. This is clearly reflected in the case of the University of Waterloo, Ontario, Canada, with the formation of its Coop and Entrepreneurial education programs, as well as innovative Intellectual Property policy (Bramwell & Wolfe, 2008). The positive outcomes of these entrepreneurial activities are not only in terms of improving regional or national economic performance but also in the form of financial advantage and gain to the enterprising universities making them less dependent on government funding for their operations (Phan &Siegel 2006; Rothaermel et al. 2007). This new mission has somewhat impelled Malaysian government to reshape and transform its HEIs. The repositioning of the higher education strategic policy has seen a greater emphasis given to universities in producing graduates with entrepreneurial mindset and capabilities and increasing the number of graduate entrepreneurs besides nurturing entrepreneurial academics and researchers. For instance, the introduction of the Entrepreneurial University Award in 2012 is said to act as a catalyst for the creation of a conducive environment and a holistic entrepreneurship development in local HEIs. This award is also meant to recognise the HEIs with excellent achievement in terms of promoting entrepreneurship education and entrepreneurial development in their institutions.

The introduction of this new agenda is not without its challenges. While the importance of entrepreneurship to the social and economic development is inevitable, the manner in which higher education institution is required to operate entrepreneurially receives a lot of debate. This is especially true when feedbacks are obtained from the non-sciences academics who contend that the obsession in the profit-oriented agenda within education system is dangerous (Philpott, Dooley, O'Reilly, & Lupton, 2011). In line with this new development, the current study seeks to explore the more fine-grained issues pertaining to the creation of the entrepreneurial university ideal within the context of a research university that is currently in the stage of the entrepreneurial trajectory. Specifically, the research aims at providing deeper insight into the views of the academic community regarding the new paradigm of an entrepreneurial university.

The Pursuit of Entrepreneurial University Ideal

The flux within the educational landscape has witnessed the gradual transition of the university core from its traditional ethos into a more entrepreneurial mode that contributes to the economic growth. Entrepreneurial university, as it is termed, has now become a part of legitimate approach for the economic and social development. This new paradigm has shifted

the conventional mission of the university which initially concentrated on teaching and research into a more sophisticated mode mimicking private entities that could eventually contribute to the economic development (Jimenez-Zarco, Cerdan-Chiscano, & Torrent-Sellens, 2013). This development path includes the self-sufficiency and self-dependency of the entrepreneurial universities, which ultimately leads to the reduction in governmental expenditure (Yokoyama, 2006). Conceptualizing this, governments are now pushing universities to embrace the paradigm of entrepreneurial university given the various external pressures which include the "massification" of higher education, employability issues, challenges of globalisation, and internationalisation strategies of universities (Gibb, Haskins, & Robertson, 2013).

In keeping pace with this new agenda, the management of the universities are moving away from a long-established organic approach towards a more interventionist top-down push approach in which the overall vision and mission of the universities have incorporated entrepreneurship and innovation as part of their core (Gibb, et al., 2013). This shift by the university towards the third mission is alleged by few academic disciplines as a menace to the main purpose of a university existence (Philpott et al., 2011). Furthermore, scholars assert that entrepreneurial university is merely a twist of a research university (Slaughter, 2004). On the contrary, Etzkowitz, Webster, Gebhardt, and Terra (2000) view the entrepreneurial university in terms of the new role of carrying out entrepreneurial activities which encompasses and extends the research university portfolio.

At another end, there are some who advocate the entrepreneurial university concept for both the internal development of the university and in response to the external influences on the academic structures (Yusof & Sapuan, 2008). Entrepreneurial flair within HEIs is seen crucial to cater for the issues of unemployability among graduates, generation of funds to the university as well as contributing to the economic growth via commercialisation activities. For this to happen, Gibb et al. (2013) highlight the fundamental issues for the pursuit of this entrepreneurial mission which include among others shared values and missions, autonomy and individual ownership, incentives to innovate, establishment of external relationships, wide opportunity for holistic project management, and encourage learning by doing. It is stated that a university that is actively pursuing academic entrepreneurship is said to be an entrepreneurial university (Mars & Rios-Aguilar, 2010). This encompasses the creation of values through organisational creation, renewal and innovation (Brennan & McGowan, 2006). In the context of a university, creating value through entrepreneurial initiatives could take the form of start-up companies, university spin-offs and joint venture (organisational creation) or the establishment of research groups, research centers, and technology transfer schemes (organisational renewal), or patenting, licensing, and design rights (organisational innovation).

According to Philpott et al, (2011), the activities within the entrepreneurial university can ranged from a broad spectrum of "soft" to "hard" initiatives as shown in Figure 1 below.

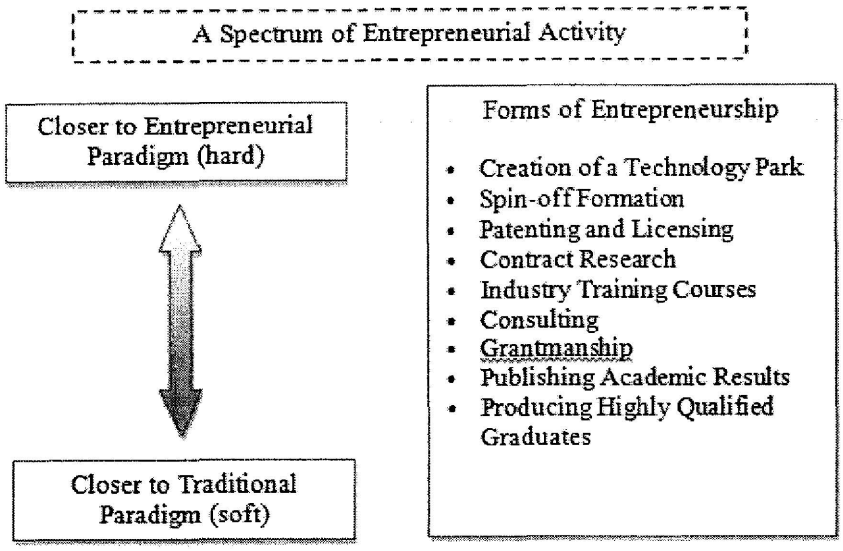

Figure 1. Entrepreneurial university spectrum of activities.

Based on the description, an entrepreneurial university is a complex structure which goes beyond the basic tenets of a research university. It is expected that entrepreneurial university will facilitate the transfer of knowledge and technology across the industry, develop industrial park, regional and local engagement, creation of public value etc. (Gibb et al., 2013). In addition to that entrepreneurial university is said to generate financial advantage to the universities and its faculties (Phan & Siegel, 2006).

Clearly, despite the increased interest in the entrepreneurial university agenda, it has been highlighted that there a few pressures relating to this which are: the capability of university laboratories for basic research, changes in legislation relating to the ownership of university intellectual property rights, decrease in university funding etc. (Philpott et al., 2011). Tuunainen (2005) affirms that developing an entrepreneurial university is not as simple as it may appear from a comprehensive perspective. Without strong and effective leadership, the transformation towards an entrepreneurial university may not be materialized (Yusof & Sapuan, 2008). The operationalization of entrepreneurial paradigm at the departmental level may hold complexities and tensions among academics hence creating the syndrome of "schizophrenic entrepreneurial character" (Clark, 1998).

The challenges that an entrepreneurial university faced in developed countries which is known as European Paradox. This paradox has been attributed to: (a) lack of entrepreneurial spirit among scientists; (b) poor intellectual property rights to university inventions; (c) differing legal systems between nations that inhibit cross border technology transfer (Yusof & Sapuan, 2008). In general there are other internal and external factors which limit the materialization of the entrepreneurial university. Major internal factors include: limited time due to classes or administrative work (Tuunainen, 2005); limited financial resources; lack of infrastructure (Tuunainen &Knuuttila , 2009); delay in fund management; and lack of skilled personnel. In addition to that major external factors are: increasing capital costs; inadequate government funds; difficulty in private sector collaboration; dearth of expert research and development personnel; lack of supplementary services to support research and development (Yusof & Sapuan, 2008). Some of these challenges are said to be applicable in both developed

and developing countries (Yokoyama, 2006). Echoing this viewpoint, Hussler, Picard, and Tang (2010) argue that contextual difference may lead to more challenges towards entrepreneurial university, with a greater pressure for those of developing ones.

As a developing country, Malaysia is increasing its spending in research and development to enhance overall competitiveness. Based on the Economic Planning Unit Ninth Malaysia Plan report from 3,337.9 million to 5,253.1 million, the allocation for research and commercialisation has shown an ascending trend (Economic Planning Unit, Ninth Malaysian Plan, 2006-2010). However, in the Tenth Malaysian Plan, the government has announced the reduction in proportion of government funding to universities in which the local HEIs are urged to seek alternative sources of funds especially through greater collaboration with in terms of research and development activities (Economic Planning Unit, 2010). As such, universities have to choice but to embark on entrepreneurial mode to generate more funds for their operations including research activities. This later development in educational scene has seen a greater emphasis on academic entrepreneurship and entrepreneurial initiatives within local HEIs.

In order to ensure the entrepreneurial posture to take root within Malaysian universities, there are several issues and challenges that need to be addressed. Based on the observations made by Yusof and Sapuan (2008), the fundamental challenges concerning the development of entrepreneurial universities revolved around attracting fund from the private sector and the willingness of private sectors to spend on universities' research activities. Along with these, other presumable challenges are include standing up to local role along with gearing up international role; addressing conflict between the role of disciplines and the role of inter-disciplines; addressing the conflict between academic disciplines, curiosity-driven 'fundamental' research versus directed, user-driven, 'applied' research; managing closer relationships with the government and industry; handling the issue regarding conflict of interest and conflict of commitment; deciding between centralized versus decentralized management of the university-industry boundary; and selecting the appropriate commercialization model for technology transfer offices (Yusof & Sapuan, 2008).

In view of this, the present study is undertaken to elucidate the underlying challenges facing a university in a developing country that is currently undergoing the transition from a research university into an entrepreneurial one. The central issue that needs to be addressed is the perception of the academics themselves in regards to this modern trend that is swirling around them. Unfolding the matter is seen crucial given that the continuity and accomplishment of the university's mission lies mainly in the commitment of these academics. The major contention of this study is that the pursuit of an entrepreneurial university paradigm is challenging and complex despite the positive outcomes it will bring to the institution.

Methodology

The present study strives to offer deeper insight into the views of the academics pertaining to the creation of an entrepreneurial university ideal within the context of a local research university where diverse disciplines coexist. In order to obtain answers to the research question, a qualitative research method was employed. Employing this approach enables the identification of "fresh" view pertaining to entrepreneurial university agenda that is gaining momentum in the context of Malaysia. Morse and Richards (2002) argue that employing a qualitative approach is appropriate if "the purpose is to learn from the participants in a setting or process the way they experience it, the meaning they put on it, and how they interpret what they experience (p. 28)." Furthermore, a qualitative approach allows the researcher to understand participants' worldview of the important issues surrounding

them rather than imposing the researchers' perceptions of what is important (Gill & Johnson, 1991) which could offer rich and localised information on what is viewed as an entrepreneurial university in the context of interest. Based on this premise, a series of interviews were undertaken to obtain a clearer picture of the present and emerging issues particularly those that are uniquely inherent in Malaysian environment pertaining to the creation of entrepreneurial universities. Altogether, ten academicians from three different streams namely Sciences, Social Sciences, and Arts were involved in this first tier of the data collection. The profile of the respondents is depicted in Table 1.

Table 1. Profile of Respondents

Respondent	Faculty	Designation	Years of service
A	Social Science	Senior Lecturer	7
B	Social Science	Associate Professor	10
C	Science	Senior Lecturer	6
D	Science	Professor	21
E	Arts	Lecturer	5
F	Arts	Senior Lecturer	8
G	Social Science	Associate Professor	13
H	Science	Senior Lecturer	9
I	Social Science	Professor	25
J	Social Science	Professor	19

To draw out meaningful feedbacks and insight into their concern on the creation of an entrepreneurial university, the informants were asked to express their view on transforming local HEIs into entrepreneurial universities. The data collected from the sample were then transcribed and analyzed based on themes in order to determine emerging patterns that enabled better comprehension of the challenges in creating entrepreneurial universities. The analysis is divided into two sections; firstly a brief discussion on what entrepreneurial univeristy means to the respondents is extracted and secondly, the challenges and dilemma facing the development of entrepreneurial universities as perceived by the academicians are identified.

Findings

Prior to delving into the challenges of the creation of entrepreneurial universities, the definition of an entrepreneurial university as perceived by the academics within the local HEI was generated. They were asked to respond to the question "What do you understand by the term entrepreneurial university?" Interestingly, the responses obtained ranged from the soft spectrum to the hard spectrum of an entrepreneurial university as described by Philpott et al. (2011) depicted in Table 2.

The findings indicate that the majority of the respondents stated that an ideal entrepreneurial university is the one that could generate its own income from the entrepreneurial activities such as creation of private enterprises, start-ups and commercialisation of university research and products. This notion is clearly skewed towards the hard spectrum of an entrepreneurial university ideal.

Table 2. Definition of an entrepreneurial university

Category	Definition of an entrepreneurial university
Closer to soft spectrum	• Generation of grants from the industry • Establishment of research centre to cater for the industry needs • Research related to the industry • Consultancy works • Contract research • Engagement with the industry • Inculcation of entrepreneurship culture among students • Prepare graduates for self-employment • Foster intrapreneurship among academics
Closer to hard spectrum	• Creation of private enterprises • Start-ups by the academics • Commercialisation of university research and products • Knowledge transfer • Establishment of science park • Income generation from entrepreneurial activities • Focus on science and technology • Innovation • Establishment of business incubator

Note: Soft-hard spectrum based on Philpott et al. (2011)

The interview proceeded with soliciting feedbacks from the respondents on their major concerns in relation to this third mission. From the interview, several themes were extracted that represents the challenges highlighted by the academicians in regards to transforming local HEIs into entrepreneurial universities. Embedding "entrepreneurial flair" into the university appears to create emotional tension among the academicians especially when the connotation of entrepreneurship is equated to creation of a new venture and income generation. The dilemmas that could inhibit the notion of entrepreneurial university to take root in the local HEI are summarised in Table 3 below.

Table 3. Type of dilemmas towards the entrepreneurial university agenda

Type of Dilemma	Description
Academic resistance	• Role overload for academicians • Derail from the original purpose of university existence • Adverse impact on academic career progression
Internal factor challenges	• Absence of a unified entrepreneurship culture • Unattractive incentives mechanisms • Absence of entrepreneurial role model and expert
Social capital issue	• Lack of industrial network • Lack of trust

Clearly, the general feelings towards the entrepreneurial mission appeared to be divided. There are strong opponents to the whole concept of entrepreneurial university especially among the chosen sample who viewed this agenda as moving from the traditional academic ethos into a purely business, profit-oriented position. The profit generating motive, according to them will deviate the fundamental of educational system that should be geared towards "creative exploration of knowledge, independence of thought, crossing the intellectual borders and challenging the ingrained beliefs". It is also worth noting that, even among those who advocated this ideal, especially those from the Sciences stream, they cautioned on the importance of proper balancing between the two main pillars of a university (i.e. teaching and research) and entrepreneurial initiatives.

Dilemma 1: Role Overload for Academicians

An in-depth discussion on the entrepreneurial university ideal revealed that 'tension' arises among the academicians pertaining to the role overload brought about by the introduction of a new mission to the university. Role overload occurs when academicians perceived that there are too many roles they have to engage in at one time. In this case, the informants perceived that the role of an academic and researcher and to some, administrators, have already posed a lot of burden to them. With the new role of becoming an academic entrepreneur, they key issue arises as to how the academics could resolve the balancing between maximising contribution to teaching, knowledge advancement (research), and income generation (entrepreneur).

Dilemma 2: Derail From the Original Purpose Of University Existence

It is not surprising that some key informants mentioned that the role of the university is not to "do business" but to "support business", which reflects the fundamental understanding of the nature of HEIs. According to some informants, entrepreneurship initiatives within the university may not generate lucrative income to the university since only a handful of the universities in the world could make money out of their entrepreneurial activities (i.e., Stanford, MIT, and University of California). The risk is the loss of time allocated for teaching and basic research which will derail the original purpose of the university existence. Instead, university should act as a conduit to create entrepreneurial awareness and mindset instead of focusing on the income generation activities.

Dilemma 3: Adverse Impact on Academic Career Progression

It was highlighted that the current promotional system within the HEIs gives a great emphasis on the publication of research papers rather than entrepreneurial initiatives. It is commonly known that entrepreneurial activities imposes a lot of risks and the process is not linear and straightforward as many thought. It requires a lot of efforts on planning, negotiation, and document preparation before revenue can be generated. This may limit the time for research publication among the academicians who aspire to pursue the entrepreneurial route. The divergent objectives of the promotional system do not help to align the interest of entrepreneurial researchers with the promotion exercise. Overtime, the interest to innovate and commercialise is taken over by the need to publish and produce more academic papers at the expense of the stagnant entrepreneurial initiatives.

Dilemma 4: Absence of a Unified Entrepreneurship Culture

Findings from the in depth interview revealed that there are major drawbacks in the current entrepreneurial ecosphere within universities. There appears to be lack of entrepreneurship culture from the start of the research right up to producing outcomes as inputs that will go into the industry. Many researchers are not market driven—they are keen

on doing research, but do not really understand the market needs. Researchers were also said to lack market knowledge and prefer to pass the commercialisation work to the 'real' entrepreneurs. It is acknowledged that inculcating entrepreneurial and innovative culture is not an easy task and "top-down' approach may not be as successful as 'bottom-up'.

Dilemma 5: Unattractive Incentives Mechanisms

Amongst the major issue plaguing university researchers is the unattractive package of incentives to push researchers to embark on entrepreneurial initiatives. For the extra works required and the lack of certainty in making sure that the research output will eventually reach the next level of innovation value chain, there is no clear pathway of the kind of rewards that they will get. Even if it does, equity holding, royalty allocation, licensing fees and transfer of intellectual properties continue to be the source of dissatisfaction among interested researchers.

Dilemma 6: Absence of Entrepreneurial Role Model and Expert

The other major challenge is the lack of entrepreneurial model and expert in entrepreneurship to assist commercialisation activities within university. For the advocators of entrepreneurial university agenda, they highlighted that the main reason for the lack of success in innovation and commercialisation initiatives is the absence of entrepreneurial role model and expert, as in many universities in Taiwan and Korea. Proper training is therefore required to train and equip the academicians with entrepreneurial skill and competencies to allow entrepreneurial university concept to take root and flourish.

Dilemma 7: Lack of Industrial Network

The lack of industrial network and social capital has been observed and reported numerous times by the academics especially those from the Sciences stream. In commercialisation, market access is very important. The ability to identify market opportunities and to take innovative products and services to market is among the primary elements of success in university innovation and commercialisation. However, for universities, the lack of industrial network seems to be a major challenge.

Dilemma 8: Lack of Trust

The involvement, commitment, and trust between the industry and academia are stated as prevailing challenges in moving research from the laboratory to the market. This absence of trust between both parties inhibits the initial step towards successful commercialisation. The researchers find it difficult to coordinate and interact with the industry in order to generate a conducive environment for innovation and commercialisation. They believed that the lack of close and informal relationship as well as trust and reciprocity have somewhat hindered knowledge transfer and commercialisation activities.

Discussion and Implication

Pushed by the underlying local and global pressures, government is now encouraging the HEIS to engage in entrepreneurial activities. While the adoption of the softer measure of entrepreneurial output is mostly welcome, the pressure arises when the harder entrepreneurial output is treated as the key performance indicator for promotion exercise, incentive allocation and budget allocation. The general sentiment among the academics especially those who abhor this modern trend is that the pursuit of entrepreneurial university may to some extend lead to a number of adverse tendencies where teaching is neglected and fundamental research is bypassed. Among those who are receptive to this new ethos, the

common expression is that challenges still remain for a unified entrepreneurial university agenda to take root in local HEIs. Industry-university synergy is crucial to ensure the smooth flow of the research products from laboratories to marketplace. The observed stumbling blocks however, are the lack of industrial network and trust between the industry and university.

Clearly, the adoption of the third mission, which is income generation via entrepreneurial initiatives within HEIs, is not without challenges and risks. The right balancing between teaching, research and entrepreneurship is crucial to ensure the smooth transition between the traditional universities into entrepreneurial universities. The internal process within the university needs a lot of tightening up especially in responding to the issue of incentive mechanism and promotional system. Importantly, the challenge for the top management is also to curb the resistance to change among the opponents and provide clear mission and direction to them by highlighting the need to respond entrepreneurial in today's dynamic and challenging environment. The presence of a unified entrepreneurial culture, entrepreneurial role model and experts are of pivotal importance.

In practical sense, for an entrepreneurial university ideal to be materialised, HEIs should embrace the role within the triple helix paradigm (Etzkowitz & Leydesdorff, 2000; Etzkowitz et al., 2000). According to Lu and Etzkowitz (2008), the triple helix relations of university-government-industry offer an analytical framework in the study of innovation process that involves knowledge networks and communications at various levels. It is also stated that the Triple Helix model will become the main strategy of local and global innovation agenda in the coming century (Etzkowitz & Leydesdorff, 2000). Hence, successful and effective inter-linkage between the three actors of university-industry–government (U-I-G) is anticipated to fast-track the transition of research discoveries and innovation from the laboratories to the marketplace, thus ensuring the harder spectrum of entrepreneurial university concept is achieved.

In addition, for a university to become entrepreneurial organisations; their members need to embrace entrepreneurial mindset and be equipped with relevant entrepreneurial skills and competencies. The existence of entrepreneurial organisational structures that create a connection between teaching, research and entrepreneurial functions need to be in place (Dearlove, 2002), so too the other elements such as governance, decision-making and leadership roles (Yokoyama, 2006). The university's efforts should be oriented towards providing its members with a conducive and supportive environment for entrepreneurship (Laukkanen, 2000). Similar with the findings of this study, Kirby (2005) explains that strategic actions intended to promote entrepreneurship related to complex issues such as reward systems, both monetary and non-monetary should also be incorporated in the new structure.

Conclusion

In short, the initiative towards transforming local universities into entrepreneurial universities is faced with various challenges. Whilst it is good if the university could offer solution to existing industrial problems or ways of satisfying future demands, universities should also help to churn out good fundamental research with potential for applications to solve present problems and develop future technologies. The key to success of this new agenda is to strike a balance between all the three missions so as to ensure that the main thrusts of a learning institution do not digress from its core functions. After all, "education is the great equalizer of the human condition" (Faruoqi, 2013).

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The Quest towards an Entrepreneurial University Paradigm: Evidence from an Emerging Economy

Noor Hazlina Ahmad[1], Hasliza Abdul Halim, Syed Abidur Rahman, and T Ramayah

Abstract

The ASEAN countries are progressing with tremendous opportunities and scopes emphasizing on the knowledge economy. Such attempt has invigorated to find new avenues of implementing the concept of entrepreneurial university. The main purpose of the study is to distinguish the Malaysian universities which possess hard and soft elements of the entrepreneurial university. Further, the study attempted to explore the possible significant differences in context of the dimensions of entrepreneurial orientation within the entrepreneurial university paradigm. Data were collected from the 536 faculty members of the Malaysian universities and an independent sample t-test was conducted to identify the group differences. The result has indicated that significant differences exist between the universities which embrace hard and soft elements of the entrepreneurial university concept. The study will assist the educationist and policy makers to way forward the concept of entrepreneurial university and become a hub for the innovation and regional development.

Keywords: *Entrepreneurial University, Entrepreneurial Orientation, Academic, Challenges.*
Field: *Entrepreneurship*

1. Introduction

The Association of South East Asian Nations (ASEAN) comprises of most dynamic and emerging knowledge economies in the Asian region, and to an extent in the world. The ASEAN countries have showed a remarkable resilience after the hard hit by the Asian financial crisis during 1990s (Irawati & Rutten, 2013). One of the drivers for the progression of these economies presumed to be the knowledge economy. However, the matter of fact is the awareness of knowledge based economy has begun less than a decade ago in this region (Afzal & Lawrey, 2012). Malaysia is one of the members of ASEAN, which has decided to transform and build its advancement path with the effort of the knowledge based economy rather than in-put driven economy (Goh, 2005). The researchers have opined and envisioned to strengthen the knowledge based economy with the preferment of entrepreneurial university (Bercovitz & Feldman, 2006). Entrepreneurial university is seen as a viable mechanism to promote knowledge and innovation given the focus on entrepreneurial activities which encompasses and extends the research university (Ahmad, Halim, Ramayah, & Rahman, 2013; Etzkowitz, Webster, Gebhardt, & Terra, 2000). The traditional mission of the university was knowledge transfer and advancement of the knowledge through basic research. Together with teaching and research, the entrepreneurial university adopts the third mission of contributing to economic development (Philpott, Dooley, O'Reilly, & Lupton, 2011). Recently, the notion of entrepreneurial university has been considered as one of the reasonable approach for the socio-economic development, particularly deliberated as an isomorphic developmental path (Etzkowitz et al., 2000) which will reduce

[1] School of Management, Universiti Sains Malaysia, 11800 Penang, Malaysia
Email: hazlina@usm.my

governmental expenditure. Being into this insight, governments around the world are pushing universities to embrace the paradigm of entrepreneurial university and Malaysia is no exception of it. However, leaning towards government's aspiration, some of the university managements are shifting from a long-established organic approach towards a more interventionist top- down push approach (Gibb, Haskins, & Robertson, 2013; Philpott et al., 2011). Though, this shift by the university towards this third mission is contended by few academic disciplines as a peril to the main purpose of a university which is, teaching and research (Philpott et al., 2011). Furthermore, scholars assert entrepreneurial university as a twist of the purpose of the research university (Slaughter, 2004). In such contradictory stand, it is important to understand the state of the entrepreneurial university concept among the Malaysian public and non-public universities. The extant researches suggest containing some elements of entrepreneurial university. Based on the extensive literature, this study has classified the comprised elements of entrepreneurial universities in to hard and soft elements. Presence of hard elements signifies more orientation towards entrepreneurial university and vise-versa. Therefore, the main objective of this study is to identify the difference of the entrepreneurial university initiatives among the two types of classifications. In doing so, an empirical research attempt has been taken through structured questionnaires. The findings of the empirical analysis will assist academicians and policy makers to get a clear picture on the state of entrepreneurial university in the Malaysian context. Further, the result derived from this study, will facilitate to incorporate required issues which needed to take into account by the government and the university authorities.

2. Literature Review

Scholars have termed the rise of entrepreneurial university as a second academic revolution (Etzkowitz, 2014). The advent of the 'entrepreneurial university' brings out twofold obligation for the higher educational institution, to produce new knowledge and also to adjust its activities and values in such a way that can assist the transfer of technology and knowledge spillovers (Audretsch, 2014). The effort to become an entrepreneurial university has also been acknowledged as to make a difference as part of the big society (Taylor, 2014). In this regard, scholars have argued that entrepreneurial university will enable to transferal of knowledge and technology across the industry, develop industrial park, regional and local engagement, creation of public value etc. (Gibb et al., 2013) and presumed to open financial benefit to the universities and its faculties (Phan & Siegel, 2006). It has been argued that to align the universities with the entrepreneurial university mindset, transfer of technology in collaboration with the industry is rather an important issue to be considered (Ernest, Matthew, & Samuel, 2015). In this regard, scholars have already acknowledged the importance to have a strong and effective leadership, which will enable the transformation towards an entrepreneurial university (Yusof & Sapuan, 2008). Despite successful materialization of entrepreneurial university in many contexts, the controversies still are droning around it. Scholars are constantly putting cautions over the implementation of entrepreneurial university as it is instigating the ethos of commercialism and 'for-profit' motive among the young researchers (Lam, 2015). Past literatures have indicated that in the developed countries the concept of entrepreneurial university encountered few impediments, which is known as European Paradox (Dosi, Llerena, & Sylos Labini, 2005). This paradox has been attributed to: (a) lack of entrepreneurial spirit among scientists; (b) poor intellectual property rights to university inventions; (c) differing legal systems between nations that inhibit cross border technology transfer. In general there are other internal and external factors which limit the materialization of entrepreneurial university. Major internal factors include limited time due to classes or administrative work; limited financial resources; lack of infrastructure; delay in fund management; and lack of skilled personnel. In addition to that major

external factors are: increasing capital costs; inadequate government funds; difficulty in private sector collaboration; dearth of expert research and development personnel; lack of supplementary services to support research and development (Yusof & Sapuan, 2008). These challenges can be context as general challenges in developed and developing countries. As according to Hussler, Picard, and Tang (2010), contextual difference may lead to mount more challenges towards entrepreneurial university.

In the context of entrepreneurial university scholars have suggested to consider research mobilization, unconventionality, industry collaboration, university policies as the dimensions which explain the entrepreneurial orientation of an entrepreneurial university (William Todorovic, McNaughton, & Guild, 2011). However, in addition, it is also important to consider the academic issue in context of the entrepreneurial university. Mobilization denotes the shift of conventional knowledge management en route for a system that provisions knowledge formation and innovation at individual or organizational level (Hasan & Crawford, 2007). However, according to, William Todorovic et al. (2011) research mobilization insinuates the engagement of external stakeholders at all stages, explicitly on the research outcomes which can be easily understandable and transferable to the concerned stakeholders. Research mobilisation perhaps can be seen under the concept of knowledge mobilisation (William Todorovic et al., 2011) which targets to support the generation, partaking, integration and applied application of the most effective knowledge available to progress the outcomes that are the intention of the organisation (Lowry, 2014).

Unconventionality indicates the magnitude of searching for new opportunities which are useful and beneficial for the stakeholders (William Todorovic et al., 2011). In the literatures of entrepreneurial university, trailing forward for new opportunities have also been considered as platform which opens up the horizon of possible outcome facilitating the conversion of the conventional knowledge to the innovative activities (D'Este & Perkmann, 2011). According to Riviezzo and Napolitano (2013), unconventionality signifies the aptitude to ascertain new opportunities other than conventional academic environment, emphasizing more on eccentric approaches in research funding, problem solving, relationships with external organizations.

Industry collaboration considers the degree of cooperation with industry at individual and organizational levels (Riviezzo & Napolitano, 2013). More specifically, William Todorovic et al. (2011) outlined that presence of industry collaboration drive department, faculty, and student to be engaged with the related industry (William Todorovic et al., 2011). It has purported that entrepreneurial universities are gradually appearing more as proactive managers of the collaboration with industry, pursuing to create valuable Intellectual Property (IP) to promote technology transfer (Bruneel, d'Este, & Salter, 2010). According to D'Este and Perkmann (2011), collaboration with industry provides a leverage to the entrepreneurial university in order to endorse and inspire entrepreneurial activities among the researchers in the university.

University policies indicates the insight of the department head regarding the central university policies and the extent to which they face possible impediments or enable the departments in their innovative and unconventional actions (Riviezzo & Napolitano, 2013). In the same line, William Todorovic et al. (2011) have indicated that university policies symbolize the departmental perception on the initiatives of university policy and objective with regard to the recognition of innovative ideas.

An important dimension need to be considered for the entrepreneurial orientation is 'Academic' in context of entrepreneurial university. Incorporating entrepreneurship courses at the university level for the students and encouraging them to participate in the entrepreneurship related activities

is an important aspect. While vowing for entrepreneurial university concept, Gibb et al. (2013) and Gibb and Hannon (2006), suggested to include entrepreneurship course in the student's curriculum, innovative pedagogical support for departments, along with active participation of students in the entrepreneurial activities.

Being a member of ASEAN, Malaysia is investing more in research and development. However, Yusof and Sapuan (2008) put cautious that there are challenges to academic leaders in nurturing entrepreneurial university in Malaysia. Among the Malaysian entrepreneurial universities, there are numerous issues and challenges. The important issues exist for creating entrepreneurial university is, attracting fund from the private sector and willingness of private sectors to pour expenditure into universities for research. Along with these, other possible challenges are: standing up to local role along with gearing up international role; addressing conflict between the role of disciplines and the role of inter-disciplines; addressing the conflict between academic freedom, deciding between centralized versus decentralized management of the university-industry boundary; selecting the appropriate commercialization model for technology transfer offices (Yusof & Sapuan, 2008).

3. Methodology

The current study attempted to explore deeper insight into the views towards the dimensions of entrepreneurial orientation and academic dimension of the two types of entrepreneurial universities which possess extent of hard and soft elements of entrepreneurial university. There were total nine hard elements and sixteen soft elements. If, either one of the nine/sixteen elements were found in the responses, the responses categorized to be in the group of hard/soft entrepreneurial university. The empirical survey was conducted on faculty members of both public and non-public universities in Malaysia. The measurement was adopted from William Todorovic et al. (2011). A total 536 usable responses were used in the study for analysis of which, 305 responses were from the universities which contains either one of the nine hard elements and 231 responses from the universities which contains either one of the soft elements of entrepreneurial university. Based on the two groups, the study performed independent sample t-test to reveal the differences on the variables of entrepreneurial orientation. The independent sample t-test was carried out with statistical package SPSS version 21. The following are the elements of hard and soft core entrepreneurial university (Table 1).

Table 1: Elements of entrepreneurial university

Types	Elements
Soft	• Strategic vision statement on entrepreneurship • Entrepreneurship academic division • Entrepreneurship as subject • Entrepreneurship integrated in core requirements • Entrepreneurship courses for non-business majors • Ongoing curriculum innovation, development of innovative pedagogies and teaching • Student-led entrepreneurship initiatives • Alumni incorporated as speakers and guest academics • Consultancy-directly selling academic expertise to external organizations • Extension education focusing on corporate/social/family entrepreneurship

	• Entrepreneurship research center with funded research program • Large-scale research grants from external sources • Entrepreneurship activities center • Networking events for entrepreneurs • Entrepreneurship student club(s) • Business plan competition
Hard	• Patenting and Licensing • Links to successful entrepreneurs, business angels, and venture funds • Business incubator • Science or technology parks • Spin-off firms formation • Technology transfer office • Entrepreneurship endowed chair • Innovation and commercialization office

4. Findings

4.1 Descriptive Statistics of Key Variables

As shown in Table 2, the mean values of all the variables found to be above the midpoint 2.50. Industry Collaboration scored the highest with a mean value of 3.90, followed by Research mobilization (3.81). The dispersion values reported through standard deviation indicates that the dispersion values were less than 1 in all the study variables. 'University policies' has the highest value of standard deviation (0.746) in the study while Research mobilization holds the lowest standard deviation with the value of 0.606.

Table 2: Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Research Mobilization	536	1.00	5.00	3.81	0.606
Unconventionality	536	1.00	5.00	3.75	0.607
Industry Collaboration	536	1.00	5.00	3.90	0.610
University Policies	536	1.00	5.00	3.69	0.746
Academic	536	1.00	5.00	3.73	0.701
Challenges	536	1.40	5.00	3.67	0.665

4.2 Independent Sample t-test

An Independent sample t-test was conducted to determine the possibility of significant differences between the hard and soft elements of entrepreneurial university. The result indicates that there were statistically significant mean difference in 5 out of 6 constructs in the context of the study variables where $p<0.01$ (refer to Table 3).

Table 3: Independent Sample t-test

Variables	Mean	Std. Deviation	t value	Sig
Research Mobilization	3.92[a]	0.546	5.01	0.000**
	3.66[b]	0.649		
Unconventionality	3.90	0.534	6.85	0.000**
	3.55	0.641		
Industry Collaboration	4.02	0.569	5.67	0.000**
	3.73	0.623		
University Policies	3.79	0.693	3.55	0.000**
	3.56	0.793		
Academic	3.77	0.721	1.62	0.106
	3.67	0.670		
Challenges	3.61	0.689	2.35	0.019**
	3.75	0.621		

Note: Upper row 'a' denotes hard elements and lower row 'b' denotes soft elements of entrepreneurial university
**denotes significant at $p<0.01$

4.3 Internal Challenges towards Entrepreneurial University Agenda

This study also explores the challenges faced by the academicians in adopting the entrepreneurial university agenda. As shown in Table 4, the biggest constraint faced by the academicians is pertaining to the workload. Apparently, the academicians felt that the requirements of an entrepreneurial university (that is mainly to generate income) posed a lot of burden in terms of managing the time especially in terms of teaching, researching, and generating income to the university.

Table 4: Internal challenges

Challenges of entrepreneurial university	Mean	Std. Deviation
Workload constrains	4.03	0.849
Absence of entrepreneurial role model	3.65	0.898
Unattractive incentive mechanism	3.76	0.923
Absence of a unified entrepreneurial culture	3.74	0.917
Adverse impact on academic career progression	3.59	0.900
Current promotional system	3.56	0.953
Absence of expert in entrepreneurship	3.54	1.008
Lack of flexibility within the university structure	3.50	1.030
Lack of autonomy to reconfigure the university	3.50	0.959
Funding is limited	3.80	1.023

The respondents also reported other forms of challenges that could be categorised into several themes namely; (1) Academic resistance, (2) Structural issues, (3) Leadership challenges, (4)

entrepreneurial culture issues, (5) social capital issues. The descriptions of challenges are depicted in Table 5.

Table 5: Other Challenges

Challenges	Description
Academic resistance	• Attitude and mind-set change is another big challenge • Balance between the teaching hours and research activities • Heavy workload
Structural issues	• Bureaucracy • Delay in the research fund • Lack of research grant for product/services/ practice oriented research • Lack of funding to promote research culture, it is just a more teaching and learning institute
Leadership Challenges	• Head of department/top management/ dean's attitude toward creating entrepreneurial university. • insufficient strategies to support new initiatives • Required policy with global accepted goal • Intelligent properties (IP) issue.
Entrepreneurial culture issues	• Resistance to new ideas and lack tolerance among academician • Lack of entrepreneurial motivation • Lack of guidance for students to inculcate entrepreneurial culture • Negative perception and mentality of certain people on entrepreneurship.
Social capital issue	• Linkage and collaboration with local industries and institutional partnership with foreign universities • Reluctance to be involved with industry due to very short deadline of period to complete a project. • Lacks international university collaboration

5. Discussion and Conclusion

The study was conducted among the faculty members from 15 public and non-public universities in Malaysia. Empirical study has classified the responses into two major categories highlighting the hard and soft core of entrepreneurial university activities. The study revealed that there is significant difference among the two types of entrepreneurial universities in context of research mobilization, unconventionality, industry collaboration, university policies, and challenges. While, in terms of academic, there is no significant difference between the two groups. Those who have hard elements of entrepreneurial university, significantly differs in these dimensions compared to those who have soft element of entrepreneurial university.

A significant difference has been revealed in context of research mobilization among the hard and soft type of entrepreneurial university. Encouraging students to seek practical applications for their research is one of the most important symbolic factors of the entrepreneurial university which possess the hard elements. The universities which contain the hard elements of entrepreneurial university are more likely to engage in research mobilization through encouraging students in the research which has implications on the industry. While the faculty members seek research opportunities outside the traditional university environment, it is considered to contain the hard elements of the entrepreneurial university. Further, the faculty members in general

compliment the attempt of the university at identifying new opportunities. In addition state of the industry collaboration is an important issue for the entrepreneurial university which comprises of hard elements. In view of the industry collaboration, faculty members of the entrepreneurial university believe that their own university should build relationships with private or public sector organization. It is presumed that it would make the institution more inclined towards the notion of entrepreneurial university. University policies for being an entrepreneurial university are a major issue. University-wide policies at the university contribute significantly towards the university accomplishing its goals and objectives. Entrepreneurial university should be very much responsive to any kind of new ideas and innovative approaches it order to be vibrant entrepreneurial university. It can be asserted that research mobilization, unconventionality, industry collaboration, university policies drives the university to be more entrepreneurial in nature. Especially these features allows the universities to institute the patenting and licensing, linking successful entrepreneurs and ventures, business and student incubator, science or technology parks, technology transfer office. However, academic dimension found to have similarity in both hard and soft type of entrepreneurial university. Irrespective of the nature, whether hard or soft, all the universities in the study found to provide emphasize on the entrepreneurship as subject in the curriculum. All the universities in Malaysia in general tend to encourage the student to participate in the entrepreneurship activities. In fact, incorporating the entrepreneurship course in the study syllabus does not confirm the state of entrepreneurial university. The notion of the current probe is, entrepreneurial university should comprise of issues which are more policy oriented and need to accomplish with wider perspective. However, the challenges to be the entrepreneurial university found to be same across all the universities in Malaysia. As a typical approach of the university, all the universities are burdened with workload. Perhaps this is one of the most significant impediments to be entrepreneurial university. Further, it is asserted that in the Malaysian universities limitation of funding is also another issue which should be considered as constraints towards entrepreneurial university. Nevertheless, there are some other challenges such as, academic resistance, structural issues, leadership challenges, entrepreneurial culture issues, and social capital issues. It is expected that if the challenges are addressed properly to the concerned authorities and the impediments are sorted out in a well-managed manner, it is expected that universities can be more entrepreneurial oriented.

It has been stated at the outset that ASEAN region is investing greater extent towards building a knowledge economy which would be ultimate developmental approach of all the member countries. It is believed that to sustain and progress it is important to accentuate the knowledge which can be collaborated with the industry. This is an approach which perhaps opens up the scope of the entrepreneurial university. In context of Malaysia, bearing some great challenges, it is anticipated that progression of the entrepreneurial university is satisfactory. However, it is still important to institute the entrepreneurial mindset among the faculty members, researchers, and students to more extent. In addition, through required financial support for research and development, universities can progress ahead towards being a full-fledged entrepreneurial university. It is not so far, embracing such practices not only in Malaysia, the ASEAN region could become a center of the world in terms of entrepreneurial university.

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Leading an Entrepreneurial University: Do We Have the Right Ecosystem?

Noor Hazlina Ahmad[1]-- Hasliza Abdul Halim[1] -- T. Ramayah[1] -- Syed Abidur Rahman[1]

[1] School of Management, Universiti Sains Malaysia 11800 Penang, Malaysia

ABSTRACT

Entrepreneurial universities play an important role as both knowledge-producer and disseminating institution. A scrutiny of the available literature suggests that most of the studies have utilised 'case study' approach to explain this phenomenon; justified by the embryonic nature of the topic field, and with the lack of a robust theoretical framework to understand it. There is lack of studies that looks into the ecosystem towards the pursuit of an entrepreneurial trajectory within the ecosystem, especially in the context of a developing country. This paper aims to contribute to a better understanding of the critical factors that conditioned these missions and to this end brings a proposal model to measure this phenomenon empirically in the light of the Resource-Based View. The methodology adopted is quantitative method in which four hundred and thirty three responses were obtained from the academicians from various faculties within the local higher education sector. Responses in regards to the presence of the right ecosystem within the universities were obtained which include resource mobilisation, unconventionality, industry collaborations, university policies and academic readiness. The challenges towards the pursuit of the entrepreneurial university were also revealed. This research could cover invaluable strategies to bring further benefits towards the creation of entrepreneurial universities.

Keywords: Entrepreneurial University, University-Industry Linkage, Academic Entrepreneurship, Entrepreneurial Ecosystem, Entrepreneurship, Higher Education.

1. Introduction

The flux within the educational landscape has witnessed the gradual transition of the university core from its traditional ethos into a more entrepreneurial mode that contributes to the economic growth. Entrepreneurial university, as it is termed, has now become a part of legitimate approach for the economic and social development. This new paradigm has shifted the conventional mission of the university which initially concentrated on teaching and research into a more sophisticated mode mimicking private entities that could eventually contribute to the economic development (Jimenez-Zarco *et al.*, 2013). This development path includes the self-sufficiency and self-dependency of the entrepreneurial universities, which ultimately leads to the reduction in governmental expenditure (Yokoyama, 2006). Conceptualizing this, governments are now pushing universities to embrace the paradigm of entrepreneurial university given the various external pressures which include the "massification" of higher education, employability issues, challenges of globalisation, and internationalisation strategies of universities (Gibb *et al.*, 2013).

Universities are urged to play a larger and enhanced role in contributing to international competitiveness of economies that could contribute to local and regional economic growth. The positive outcomes of these entrepreneurial activities are not only in terms of improving regional or national economic performance but also in the form of financial advantage and gain to the enterprising universities, making them less dependent on government funding for their operations (Phan and Siegel, 2006).

This new mission has somewhat impelled Malaysian government to reshape and transform its Higher Education Insititutions (HEIs). The repositioning of the higher education strategic policy has seen a greater emphasis given to universities in producing graduates with entrepreneurial mindset and capabilities. The initiative has also contributed in increasing the number of graduate entrepreneurs along with nurturing entrepreneurial academics and researchers. For instance, the introduction of the Entrepreneurial University Award in 2012 is said to act as a catalyst for the creation of a conducive environment and a holistic entrepreneurship development in local HEIs. This award is also meant to recognise the HEIs with excellent achievement in terms of promoting entrepreneurship education and entrepreneurial development in their institutions.

As a developing country, Malaysia is increasing its spending in research and development to enhance overall competitiveness. In the Ninth Malaysian Plan (2006-2010), the government had allocated RM 3,337.9 million to RM 5,253.1 million for research and commercialisation which is seemed to be an ascending trend (Economic Planning Unit, 2006). However, in the Tenth Malaysian Plan, the government has announced the reduction in proportion of government funding to universities in which the local HEIs are urged to seek alternative sources of funds especially through greater collaboration with in terms of research and development activities (Economic Planning Unit, 2006). As such, universities have no choice but to embark on entrepreneurial mode to generate more funds for their operations including research activities. This later development in educational scene has seen a greater emphasis on academic entrepreneurship and entrepreneurial initiatives within the local HEIs.

Against this backdrop, the present study is undertaken to explore the perception of academicians within Malaysia HEIs in terms of the availability of the factors that move the institutions towards an entrepreneurial university agenda. This study also attempts to obtain feedback on the underlying challenges facing by a university of a developing country that is currently undergoing the transition from a research university into an entrepreneurial one.

2. Literature Review

Entrepreneurial university has now become a part of legitimate approach for the economic and social development. The conventional mission of the university was initially concentrated on the transfer of knowledge and advancement of the knowledge through basic research. Together with teaching and research, the entrepreneurial university adopts the third mission of contributing to economic development (Philpott *et al.*, 2011) through generating own funding opportunities. According to Etzkowitz (2004) entrepreneurial university, is an isomorphic developmental path which includes the self-sufficiency and self- dependency of the entrepreneurial universities, ultimately which will reduce governmental expenditure. Such conceptualization has encouraged governments to influence the universities to embrace the paradigm of entrepreneurial university. Therefore, some of the university managements are budging away from a long-established organic approach towards a more interventionist top- down push approach (Philpott *et al.*, 2011; Gibb *et al.*, 2013). The conceptualization and practice of entrepreneurial university has been also seen as an extension of Research University with fund raising motivation (Etzkowitz, 2003). In this regard, it is important to consider the role of entrepreneurial orientation in context of entrepreneurial university.

The distinction between entrepreneurship and entrepreneurial orientation has now become acknowledged by the academia and scholars. According to Lumpkin and Dess (1996), entrepreneurial orientation refers to the strategic orientation, decision making activities, method, and practices. As such, key players functioning in a dynamic multiplicative process should be involved with intention and actions aiming for new venture creation (Lumpkin and Dess, 1996). In a similar line, Wiklund and Shepherd (2003), explained entrepreneurial orientation as process that enables organizations to lead in a competitive and dynamic environment. The benefit of engaging in activities with the entrepreneurial manner by the large organizations is found to be widely emphasized in the extant literatures of 'entrepreneurial orientation' (Todorovic *et al.*, 2011). It has been suggested by Covin and Miles (1999) that entrepreneurial orientation facilitates to scan and monitor constantly for explore new opportunities which would strengthen the competitive position of the organizations. In the extant literature of entrepreneurial orientation, the dimensions of autonomy, innovativeness, risk taking, pro-activeness, and competitive aggressiveness has been supplemented by Lumpkin and Dess (1996). There have been substantial completions on the fundamental dimensions of entrepreneurial orientation in the context of large commercial corporations (Todorovic *et al.*, 2011). Significant number of studies also have been carried out to explore the level of entrepreneurial orientation among the public organizations and small medium enterprises (Caruana *et al.*, 2002; Keh *et al.*, 2007). However, the consideration of economic

advantages and financial dependency on own have prompted universities to shift the mindset towards the commercialization of the valuable resources (Todorovic *et al.*, 2011). In the context of entrepreneurial university, Todorovic *et al.* (2011) have examined research mobilization, unconventionality, industry collaboration, university policies as the dimensions which explain the entrepreneurial orientation of an entrepreneurial university.

Mobilization refers to the shift of traditional knowledge management towards a system that supports knowledge creation and innovation at individual or organizational level (Hasan and Crawford, 2007). However, according to, Todorovic *et al.* (2011), research mobilization refers to engagement of external stakeholders at all stages, specifically on the research outcomes which can be easily understandable and transferable to the concerned stakeholders. Unconventionality signifies the extent of searching for new opportunities which are useful and beneficial for the stakeholders (Todorovic *et al.*, 2011). In the literatures of entrepreneurial university, the issues of pursuing for new opportunities have also been well discussed as it opens up the horizon of possible outcome which facilitate to convert the traditional knowledge to the innovative activities (Clark, 2001). Industry collaboration, refers to the engagement of department, faculty, and student with the related industry (Todorovic *et al.*, 2011). The industry collaboration has been seen as the commercialization of knowledge to the industry in a collaborative manner which brings win-win situation for both the university and industry (Siegel *et al.*, 2003). According to D'Este and Perkmann (2011), in context of entrepreneurial university, collaboration with industry gives a leverage to promote and encourage more entrepreneurial activities among the researchers in the university. University policies represent the departmental perception on the initiatives of university policy and objective with regard to the recognition of innovative ideas (Todorovic *et al.*, 2011). Another important dimension to be included in the entrepreneurial orientation is 'Academic'. It refers to the engaging in entrepreneurship teaching at the university level for the students and encouraging them to participate in the entrepreneurship related activities. While vowing for entrepreneurial university concept, Gibb and Hannon (2006), suggested including entrepreneurship course in the student's curriculum, innovative pedagogical support for departments, along with active participation of students in the entrepreneurial activities. However, Hills (1988) believes that implementing the courses on entrepreneurship requires integration of the functional areas.

Beside the entrepreneurial orientation, there are some challenges emerges to implement the concept. Challenges to entrepreneurial university faced by developed countries which is known as European Paradox. This paradox has been attributed to: (a) lack of entrepreneurial spirit among scientists; (b) poor intellectual property rights to university inventions; (c) differing legal systems between nations that inhibit cross border technology transfer. In general there are other internal and external factors which limit the materialization of entrepreneurial university. Major internal factors include: limited time due to classes or administrative work; limited financial resources; lack of infrastructure; delay in fund management; and lack of skilled personnel. In addition to that major external factors are: increasing capital costs; inadequate government funds; difficulty in private sector collaboration; dearth of expert research and development personnel; lack of supplementary services to support research and development (Yusof and Sapuan, 2008).

3. Methodology

The present study strives to offer deeper insight into the views of the academics pertaining to the creation of an entrepreneurial university ideal within the context of HEIs in Malaysia. The survey was conducted on 6 Public and 7 non public universities in Malaysia. The measurement was adopted from Rice *et al.* (2010). A total 433 usable responses were used in the study for analysis of which, 263 responses from public university and 170 responses from the non-public university.

3.1. Respondents' Profile

As depicted in Table 1, most of the respondents age are 46 years and above. 52% of the total respondents are male and 48% are female. Of the total respondents, 40% working as lecturer in different faculties of the university and 9.2% are Professors. In context of the experience, more than 50% of the total respondents have been working as professional for 1 to 10 years. While the study was conducted, 57.3% of the respondents were working with the current university for 1 to 5 years.

Table-1. Respondents' Profile

Variable	Description	Frequency	Percent	Cumulative Percent
Age	26 to 30	76	17.6	17.6
	31 to 35	79	18.2	35.8
	36 to 40	94	21.7	57.5
	41 to 45	46	10.6	68.1
	46 & above	138	31.9	100.0
Gender	Male	225	52.0	52.0
	Female	208	48.0	100.0
Position	Professor	40	9.2	9.2
	Associate Professor	65	15.0	24.2
	Senior Lecturer	152	35.1	59.4
	Lecturer	176	40.6	100.0
Experience	1 to 5 years	149	34.4	34.4
	6 to 10 years	106	24.5	58.9
	11 to 15 years	55	12.7	71.6
	16 to 20 years	43	9.9	81.5
	21 years & above	80	18.5	100.0
Current university experience	1 to 5 years	248	57.3	57.3
	6 to 10 years	73	16.9	74.1
	11 to 15 years	50	11.5	85.7
	16 to 20 years	24	5.5	91.2
	21 years & above	38	8.8	100.0
University Type	Public University	263	60.7	60.7
	Non Public University	170	39.3	100.0

4. Findings

4.1. Descriptive Statistics of Key Variables

As shown in Table 2, the mean values of all the variables found to be above the midpoint 2.50. Industry Collaboration holds the highest with a mean value of 3.943, followed by Research Mobilization (3.848). The dispersion values reported through standard deviation indicates that the dispersion values were less than 1 in all the study variables. Environmental Informal Factors has the highest value of standard deviation (0.955) in the study while Research mobilization holds the lowest standard deviation with the value of 0.616.

Table-2. Descriptive statistics of the variables

	Minimum	Maximum	Mean	Std. Deviation
Research Mobilization	1.00	5.00	3.848	.6164
Unconventionality	1.00	5.00	3.755	.6420
Industry Collaboration	1.00	5.00	3.943	.6264
University Policies	1.00	5.00	3.681	.7689
Academic	1.00	5.00	3.722	.7414
Entrepreneurial University Mission	1.00	5.00	3.654	.7226
Environmental Formal Factors	1.00	5.00	3.312	.8399
Environmental Informal Factors	1.00	5.00	3.251	.9558

4.2. Independent Sample t-test

An Independent sample t-test was conducted to determine the possibility of significant differences between the respondents of public and non-public university. The result indicates that there were statistically significant mean difference in 7 out of 9 constructs in the context of the study variables with $p<0.05$ (refer to Table 3).

Table-3. Independent Sample t-test (public and non-public universities)

	Variables	Mean	Std. Deviation	*t value*	Sig
1	Research Mobilization	3.901[a]	0.535	2.12	.035*
		3.765[b]	0.717		
2	Unconventionality	3.829	.560	2.86	.005*
		3.639	.811		
3	Industry Collaboration	4.025	0.573	3.42	.001*
		3.816	0.684		
4	University Policies	3.743	0.760	2.11	.035*
		3.584	0.775		
5	Academic	3.682	0.755	-1.40	.161
		3.784	0.718		
6	Entrepreneurial University Mission	3.798	0.622	5.03	.000*
		3.431	0.807		
7	Environmental Formal Factors	3.399	0.770	2.59	.010*
		3.178	0.924		
8	Environmental Informal Factors	3.250	0.967	-.029	.977
		3.253	0.941		

Note: Upper row 'a' denotes public university and lower row 'b' denotes non-public university
*denotes significant at $p<0.05$

4.3. Internal Challenges towards Entrepreneurial University Agenda

As mentioned at the outset, this study also explores the challenges faced by the academicians in adopting the entrepreneurial university agenda. As shown in Table 4, the biggest constraint faced by the academicians is pertaining to the workload. Apparently, the academicians felt that the requirements of an entrepreneurial university (that is mainly to generate income) posed a lot of burden in terms of managing the time especially in terms of teaching, researching, and generating income to the university.

Table-4. Internal Challenges towards Entrepreneurial University Agenda

Internal Challenges	Mean	SD
1. Workload constraints	4.11	.873
2. Absence of entrepreneurial role model	3.69	.939
3. Unattractive incentive mechanism	3.80	.965
4. Absence of a unified entrepreneurial Culture	3.75	.964
5. Adverse impact on academic career progression	3.57	.938
6. Current promotional system impede engagement 7. in entrepreneurship activities	3.55	.997
8. Absence of expert in entrepreneurship	3.55	1.04
9. Lack of flexibility within the university structure	3.52	1.08
10. Lack of autonomy to reconfigure the university	3.51	.993
11. Funding is limited	3.83	1.07

The respondents also reported other forms of challenges that could be categorised into several themes namely; (1) Academic resistance, (2) Structural Issues, (3) Leadership Challenges, (4) Entrepreneurial Culture issues, (5) Social Capital issues. The description of challenges are depicted in Table 5.

Table-5. Other Challenges

Challenges	Description
Academic resistance	• Attitude and mind-set change is another big challenge • Balance between the teaching hours and research activities • Heavy workload • Talent need to be sought by using entrepreneurial attributes. • The concept is still at faculty level not university level
Structural issues	• Bureaucracy • Career path way via enterprising is limited or not well understood. Publication is still the key requirement for professorship or promotion • Delay in the research fund • Does not seriously recognize the contribution of staff to development of university • Too much emphasize on research & publication, obsess with world ranking • Lack of research grant for product/services/ practice oriented research • Lack of funding to promote research culture, it is just a more teaching and learning institute
Leadership Challenges	• Head of department/top management/ dean's attitude toward creating entrepreneurial university. • insufficient strategies to support new initiatives • Required policy with global accepted goal • Intelligent properties (IP) issue.
Entrepreneurial culture issues	• Resistance to new ideas and lack tolerance among academician • Lack of entrepreneurial motivation • Lack of guidance for students to inculcate entrepreneurial culture • Negative perception and mentality of certain people on entrepreneurship.
Social capital issue	• Linkage and collaboration with local industries and institutional partnership with foreign universities • Reluctance to be involved with industry due to very short deadline of period to complete a project. • Lacks international university collaboration

4.4. Availability of Elements of an Entrepreneurial University

The study also asked respondents to respond to the availability of the elements reflecting an entrepreneurial university by referring to their own institutions. As shown in Table 6, it has been revealed that 58% of the respondents identified "Entrepreneurship as subject" as an element of entrepreneurial university undertaken by the university. However, Strategic vision statement on entrepreneurship, On-going curriculum innovation, development of innovative pedagogies and teaching, Student led Entrepreneurship initiatives, Consultancy-directly selling academic expertise to external organizations, Alumni incorporated as speakers and guests of the academics, Innovation and commercialization office, Entrepreneurship student club, Patenting and Licensing were also found to be identified as entrepreneurial university elements of the respective universities.

Table-6. Elements of an Entrepreneurial University

Elements of an Entrepreneurial University	N	% of cases
1. Entrepreneurship as subject	251	58.0%
2. Strategic vision statement on entrepreneurship	208	48.0%
3. On-going curriculum innovation, development of innovative pedagogies and teaching	190	43.9%
4. Student led Entrepreneurship initiatives	184	42.5%
5. Consultancy-directly selling academic expertise to external organizations	164	37.9%

Continue

6. Alumni incorporated as speakers and guests of the academics	158	36.5%
7. Innovation and commercialization office	152	35.1%
8. Entrepreneurship student club	141	32.6%
9. Patenting and Licensing	136	31.4%
10. Entrepreneurship courses for non-business majors	131	30.3%
11. Entrepreneurship academic division	125	28.9%
12. Business plan competition	114	26.3%
13. Networking events for entrepreneurs	110	25.4%
14. Entrepreneurship activities centre	109	25.2%
15. Entrepreneurship integrated in core requirements	104	24.0%
16. Large scale research grants from external sources	95	21.9%
17. Links to successful entrepreneurs, business angels, and venture funds	92	21.2%
18. Science or technology parks	88	20.3%
19. Extension education focusing on cooperate/social/ family entrepreneurship	75	17.3%
20. Technology transfer office	75	17.3%
21. Business incubator	63	14.5%
22. Entrepreneurship research centre with funded research centre	63	14.5%
23. Spin off firms formation	63	14.5%
24. Students incubator	45	10.4%
25. Entrepreneurship endowed chair	41	9.5%

5. Discussion and Conclusion

The study was conducted among the 13 public and non-public universities in Malaysia. The respondents were faculty members positioned as lecturer to Professor from different faculties. This paper is set out to illustrate the descriptive analysis of the research carried out on the entrepreneurial university. The analysis revealed that industry collaboration being a part of entrepreneurial orientation is well practiced among all the universities in Malaysia. Industry collaboration represents the engagement of students, teachers, and relevant department with the industry. It is important for the university to be recognized by the industry, which would ease the way to be successful in the entrepreneurial initiatives. While any university is recognized by the industry, it's become easy to position the students in the respective industry for employment. Further, industry collaboration represents the acceptance of the innovative work and research carried out by the university that indicates the activities are in line with the concept of entrepreneurial orientation. Following the industry collaboration, the mobilization of knowledge (research) is also well applied in the Malaysian universities. The universities are appeared to be encouraging the research and its practical implication for the industry. In doing so, the researchers of the universities are working in partnership with the external professionals. The outcome of the research should be beneficial for the industry with its practical implications. To embrace the mind-set of becoming entrepreneurial in nature it is also important to seek for new opportunities for the research initiatives. Considering the associated risk, exploring the new prospects for research and outcome will assist the universities to be aside of conventional or traditional approach for research. However, inclusion of the entrepreneurship courses in the academic syllabus and enthusiasm of universities reflecting on the policies related to entrepreneurship, also significant for establishing entrepreneurial university.

It has also been found that both the public and non-public universities gives greater emphasize on the curriculum to develop the entrepreneurship mind-set among the students in Malaysia. It is obvious that inclusion of the entrepreneurship courses in the study program will create an access to knowledge regarding the entrepreneurship and its widespread scope. Such awareness of entrepreneurship will create a favourable attitude towards entrepreneurship among the staffs and the students. Interestingly, with regard to generating entrepreneurs, publishing scientific papers, knowledge transfer, and challenges faced by the universities found to possess significant difference between the public and non-public universities. Perhaps the ownership structure is the main reason for such significant variation between these two types of universities. In context to the challenges in creating an entrepreneurial university, staffs of the

universities identified workload constraints as most important impediment following the funding limitation and unified entrepreneurial culture. The teaching staffs typically are engaged with teaching, dealing with students and papers, examinations, and publishing research papers which is essential part of their responsibility. At the same time it is difficult for them to manage time and effort for other involvements while carrying out the major responsibilities. Further, limited and unattractive funding and the mechanism is also another barrier for creating entrepreneurial university. Due to the lack of appropriate funding, most of the cases researchers step back from researches which would facilitate to become entrepreneurial university. Nevertheless, 58% of the respondents identified "Entrepreneurship as subject" as significant element of entrepreneurial university which is possessed by their own university. In addition, strategic vision statement on entrepreneurship, On-going curriculum innovation, development of innovative pedagogies and teaching, Student led Entrepreneurship initiatives, Consultancy-directly selling academic expertise to external organizations, Alumni incorporated as speakers and guests of the academics, Innovation and commercialization office, Entrepreneurship student club, Patenting and Licensing were also found to be identified as entrepreneurial university elements for the respective universities.

In summary, the study has given an overall picture of the state of the concept of entrepreneurial university in Malaysia. Most of the universities found to have entrepreneurial mindset, nonetheless with some challenges related with workload and funding. If the universities along with the policy makers take appropriate initiatives and measures, it is possible to make the each university to be self-dependent in terms of generating funding and thus establish itself as entrepreneurial university.

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Revealing an open secret: Internal challenges in creating an entrepreneurial university from the lens of the academics

Noor Hazlina Ahmad, Hasliza Abdul Halim, T Ramayah and Syed Abidur Rahman
School of Management,
Universiti Sains Malaysia,
11800 Penang, Malaysia.
{hazlina, haslizahalim, ramayah}@usm.my and syedabid728@gmail.com

Abstract—**The recent development in the educational landscape has seen an increased demand being placed on higher education institutions to play an active role in economic development and income generation via the formation of "entrepreneurial universities". This study aims at understanding the perception of the academics towards the mission of creating the entrepreneurial university in the context of a research university. The underlying complexities in achieving this mission are extracted from a series of semi-structured interviews with the academicians from various faculties. The findings revealed conflicting views pertaining to the movement towards this new mission. In addition, the internal challenges towards the creation of the entrepreneurial university are also discussed.**

Keywords- Entrepreneurial university; Academics; Internal challenges; Government; Entrepreneurship.

I. INTRODUCTION

It is recognized that the most important challenge for Malaysia is now to increase the level of enterprise creation and continue to cultivate a strong culture of entrepreneurship in every sphere of the Malaysian society. This new development has also impacted the education landscape since universities are said to have a special role in the entrepreneurial ecosphere. The repositioning of higher education strategic policy has seen a greater emphasis given to universities in producing graduates with entrepreneurial mindset and capabilities and increasing the number of graduate entrepreneurs besides nurturing entrepreneurial academics and researchers.

Within this context, entrepreneurial universities are required to undertake one other mission--apart from teaching and knowledge advancement (research)--that is knowledge transfer and commercialization activities for income generation via entrepreneurial initiatives. Universities are now encouraged to promote entrepreneurship among students and academics as well as to embed entrepreneurial thinking and practices within the curriculum, co-curriculum and research activities. For instance, the Entrepreneurial University Award has been introduced in 2012 to act as a catalyst for the creation of a conducive environment and a holistic entrepreneurship development in local HEIs [3]. This award is also meant to recognize the HEIs with excellent achievement in terms of promoting entrepreneurship education and entrepreneurial development in their institutions.

It is based on this premise that the current study is undertaken to explore the more fine-grained issues pertaining to the creation of the entrepreneurial university ideal within the context of a research university that is currently in the stage of the entrepreneurial trajectory. Specifically, the research aims at providing deeper insight into the views of the academic community regarding the new paradigm of the entrepreneurial university.

II. LITERATURE REVIEW

Entrepreneurial university has now become a part of a legitimate approach for the economic and social development. The conventional mission of the university was initially concentrated on the transfer of knowledge and advancement of the knowledge through basic research. Together with teaching and research, the entrepreneurial university adopts the third mission of contributing to economic development [6]. This development path includes the self-sufficiency and self-dependency of the entrepreneurial universities, which ultimately will reduce governmental expenditure. Conceptualizing the issue, governments are pushing universities to embrace the paradigm of the entrepreneurial university given the various external pressures which include "massification" of higher education, employability issues, challenges of globalization, and internationalization strategies of universities [2]. Keeping pace with this approach of the government, some of the university managements are budging away from a long-established organic approach towards a more interventionist top- down push approach [2]. This shift by the university towards this third mission is alleged by few academic disciplines as a menace to the main purpose of a university which is, teaching and research [6]. Furthermore, scholars assert entrepreneurial university as a twist of the purpose of the research university [7]. On the contrary, a study

views the entrepreneurial university in terms of the new role of carrying out entrepreneurial activities which encompasses and extends the research university [1].

According to the literature, the activities within the entrepreneurial university can range from a broad spectrum of "soft" to "hard" initiatives as shown in Fig. 1 below [6]. Based on the description, an entrepreneurial university is a complex structure which goes beyond the basic tenets of a research university. It has been expected that entrepreneurial university will facilitate the transfer of knowledge and technology across the industry, develop industrial park, regional and local engagement, creation of public value etc. [2]. In addition to that entrepreneurial university is said to generate financial advantage to the universities and its faculties [5].

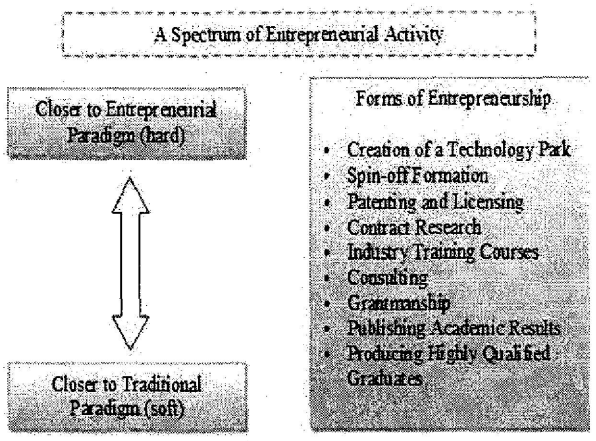

Figure 1: Entrepreneurial university spectrum of activities

Many researchers and scholars are now advocating the entrepreneurial university concept for both the internal development of the university and in response to the external influences on the academic structures [10]. Recently, a study highlighted the fundamental characteristics of an entrepreneurial university as shown in Fig. 2 below [2]:

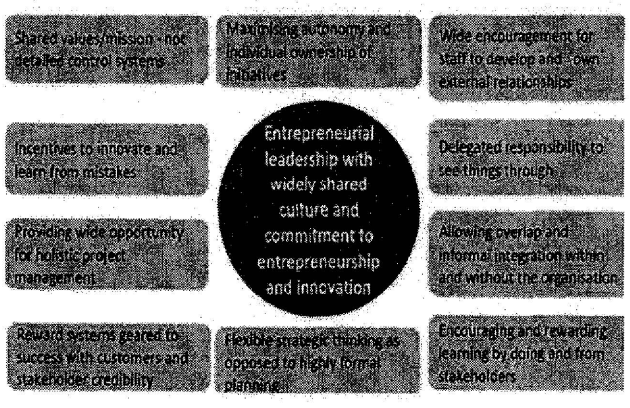

Figure 2. Universities as Entrepreneurial Organisations

Despite the increased interest in the entrepreneurial university agenda, it has been highlighted that there a few pressures relating to this which are: the capability of university laboratories for basic research, changes in legislation relating to the ownership of university IP rights, decrease in university funding etc. [6]. A study affirmed that developing an entrepreneurial university is not as simple as it may appear from a comprehensive perspective [8]. Without strong and effective leadership, the transformation towards an entrepreneurial university may not be materialized [10]. Specifically, according to the literature, operationalization of entrepreneurial paradigm at the departmental level may hold complexities and tensions [9].

There are some challenges to entrepreneurial university faced by developed countries which is known as European Paradox. This paradox has been attributed to: (a) lack of entrepreneurial spirit among scientists; (b) poor intellectual property rights to university inventions; (c) differing legal systems between nations that inhibit cross border technology transfer. In general there are other internal and external factors which limit the materialization of the entrepreneurial university. Major internal factors include: limited time due to classes or administrative work; limited financial resources; lack of infrastructure; delay in fund management; and lack of skilled personnel. In addition to that major external factors are: increasing capital costs; inadequate government funds; difficulty in private sector collaboration; dearth of expert research and development personnel; lack of supplementary services to support research and development [10]. These challenges are said to be applicable in both developed and developing countries. Having noted that, the scholars argue that the contextual difference may lead to more challenges towards entrepreneurial university, with a greater pressure for those of developing ones [4].

As a developing country, Malaysia is increasing spending in research and development though it's not as similar as developed countries. Considering this, scholars infer that there are great challenges to academic leaders in fostering entrepreneurial university in Malaysia [10]. Therefore, Malaysian entrepreneurial universities may face several issues and challenges. The fundamental issues exist for creating entrepreneurial university is, attracting fund from the private sector and willingness of private sectors to pour expenditure into universities for research. Along with these, other presumable challenges are: standing up to local role along with gearing up international role; addressing conflict between the role of disciplines and the role of inter-disciplines; addressing the conflict between academic freedom, curiosity-driven 'fundamental' research versus directed, user-driven, 'applied' research; managing closer relationships with the government and industry; handling the issue regarding conflict of interest and conflict of commitment; deciding between centralized versus decentralized management of the university-industry boundary; selecting the appropriate commercialization model

for technology transfer offices. It is in view of these challenges that the present study is undertaken to understand the underlying challenges facing a university in a developing country in the transition from a traditional university into an entrepreneurial one.

III. METHODOLOGY

In order to obtain answers to the research question, a qualitative research method was employed. Semi-structured interviews were conducted on an individual, face-to-face basis. A series of interviews were undertaken to obtain a clearer picture of the present and emerging issues particularly those that are uniquely inherent in the Malaysian environment pertaining to the creation of entrepreneurial universities. Altogether, ten academicians were involved in this first tier of the data collection. To draw out their meaningful feedback and insights into their concern on the creation of an entrepreneurial university, the informants were asked to express their view on transforming local HEIs into entrepreneurial universities. The data collected from the sample were then transcribed and analyzed based on themes in order to determine emerging patterns that will enable better comprehension of the challenges in creating entrepreneurial universities.

IV. FINDINGS

From the interview, several themes were extracted that represents the challenges highlighted by the academicians in regards to transforming local HEIs into entrepreneurial universities. Embedding "entrepreneurial flair" into the university appears to create emotional tension among the academicians especially when the connotation of entrepreneurship is often equated to the creation of a new venture and income generation. Based on this, the following challenges are identified:

Theme 1: Role overload for academicians

An in-depth discussion on the entrepreneurial university ideal has revealed that 'tension' arises among the academicians pertaining to the role overload brought about by the introduction of a new mission to the university. Role overload occurs when academicians perceived that there are too many roles they have to engage in at one time. In this case, the informants perceived that the role of an academic and researcher and for some, administrators, have already posed a lot of burden to them. With the new role of becoming an academic entrepreneur, their key issue arises as to how the academics could resolve the balancing between maximizing contribution to teaching, knowledge advancement (research), and income generation (entrepreneur).

Theme 2: Derail from the original purpose of university existence

It is not surprising that some key informants mentioned that the role of the university is not to "do business" but to "support business", which reflects the fundamental understanding of the nature of HEIs. According to some informants, entrepreneurship initiatives within the university may not generate lucrative income to the university since only a handful of the universities in the world could make money out of their entrepreneurial activities (i.e., Stanford, MIT, and University of California). The risk is the loss of time allocated for teaching and basic research which will derail the original purpose of the university existence. Instead, the university should act as a conduit to create entrepreneurial awareness and mindset instead of focusing on the income generation activities.

Theme 3: Absence of a unified entrepreneurship culture

Findings from the in depth interview revealed that there are major drawbacks in the current entrepreneurial ecosphere within universities. There appears to be a lack of entrepreneurship culture from the start of the research right up to producing the outcomes as inputs that will go into the industry. Many researchers are not market driven—they are keen on doing research, but do not really understand the market needs. Researchers were also said to lack market knowledge and prefer to pass the commercialization work to the 'real' entrepreneurs. It is acknowledged that inculcating an entrepreneurial and innovative culture is not an easy task and "top-down' approach may not be as successful as 'bottom-up'

Theme 4: Unattractive incentive mechanisms

Amongst the major issue plaguing university researchers are the unattractive package of incentives to push researchers to embark on entrepreneurial initiatives. For the extra works required and the lack of certainty in making sure that the research output will eventually reach the next level of innovation value chain, there is no clear pathway of the kind of rewards that they will get. Even if it does, equity holding, royalty allocation, licensing fees and transfer of intellectual properties continue to be the source of dissatisfaction among interested researchers.

Theme 5: Absence of entrepreneurial role model and expert

The other major challenge is the lack of entrepreneurial model and expert in entrepreneurship to assist commercialisation activities within university. For the advocators of entrepreneurial university agenda, they highlighted that the main reason for the lack of success in innovation and commercialization initiatives is the absence of entrepreneurial role model and expert, as in many universities in Taiwan and Korea. Proper training is therefore required to train and equip the academicians with entrepreneurial skill and competencies to allow entrepreneurial university concept to take root and flourish.

V. CONCLUSION

Clearly, the adoption of the third mission, which is economic development via entrepreneurial initiatives within HEIs, is not without challenges and risks. The right balancing between teaching, research and entrepreneurship is crucial to

ensure the smooth transition between the traditional universities into entrepreneurial universities. The internal process within the university needs a lot of tightening up especially in responding to the issue of incentive mechanism and promotional system. Importantly, the challenge for the top management is also to curb the resistance to change among the opponents and provide clear mission and direction to them by highlighting the need to respond entrepreneurial in today's dynamic and challenging environment. The presence of a unified entrepreneurial culture, entrepreneurial role model and experts are of pivotal importance.

In summary, the initiative towards transforming local universities into entrepreneurial universities is faced with various challenges. Whilst it is good if the university could offer a solution to existing industrial problems or ways of satisfying future demands, universities should also help to churn out good fundamental research with potential for applications to solve present problems and develop future technologies.

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Tarikh Cetakan : 07/01/2016

UNIVERSITI SAINS MALAYSIA

JABATAN BENDAHARI

PENYATA PERBELANJAAN SEHINGGA 30 NOVEMBER 2015

Projek : CREATING AN ENTREPRENEURIAL ECOSPHERE WITHIN HIGHER LEARNING INSTITUTIONS: TOWARDS A MODEL OF ENTREPRENEURIAL UNIVERSITY
TEMPOH : 15 DISEMBER 2012 HINGGA 14 DISEMBER 2014 (LANJUTAN SEHINGGA 30 JUN 2015)
KETUA PROJEK : PROFESOR MADYA NOOR HAZLINA AHMAD
PENYELIDIK BERSAMA: PROFESOR RAMAYAH THURASAMY
PUSAT PENGAJIAN PENGURUSAN

No. Akaun : 1001.PMGT.816222.

Vot	Nama Vot	Peruntukan Projek	Perbelanjaan Terkumpul Sehingga Thn Lalu	Baki Peruntukan Tahun Lalu	Peruntukan Thn Semasa	Jumlah Peruntukan Thn Semasa	Tanggungan Semasa	Bayaran Thn Semasa	Jum Belanja Thn Semasa	Baki Projek
111	GAJI	72,000.00	43,318.76	28,681.24	0.00	28,681.24	0.00	12,600.00	12,600.00	16,081.24
113	SUMBANGAN MAJIKAN	0.00	65.00	-65.00	0.00	-65.00	0.00	0.00	0.00	-65.00
115	LAIN-LAIN EMOLUMEN	0.00	500.00	-500.00	0.00	-500.00	0.00	0.00	0.00	-500.00
221	PERJALANAN DAN SARA HIDUP	27,128.00	24,035.02	3,092.98	0.00	3,092.98	0.00	12,091.41	12,091.41	-8,998.43
223	PERHUBUNGAN DAN UTILITI	5,800.00	0.00	5,800.00	0.00	5,800.00	0.00	0.00	0.00	5,800.00
224	SEWAAN	7,080.00	0.00	7,080.00	0.00	7,080.00	0.00	0.00	0.00	7,080.00
227	BEKALAN DAN BAHAN LAIN	8,408.00	10,791.16	-2,383.16	0.00	-2,383.16	0.00	0.00	0.00	-2,383.16
228	PENYELENGGARAN & PEMBAIKAN KECIL	0.00	390.00	-390.00	0.00	-390.00	0.00	0.00	0.00	-390.00
229	PERKHIDMATAN IKTISAS & HOSPITALITI	15,000.00	27,431.99	-12,431.99	0.00	-12,431.99	0.00	2,115.06	2,115.06	-14,547.05
335	HARTA MODAL	10,000.00	3,899.00	6,101.00	0.00	6,101.00	0.00	0.00	0.00	6,101.00
552	PERBELANJAAN LAIN	0.00	60.00	-60.00	0.00	-60.00	0.00	0.00	0.00	-60.00
	Jumlah	**145,416.00**	**110,490.93**	**34,925.07**	**0.00**	**34,925.07**	**0.00**	**26,806.47**	**26,806.47**	**8,118.60**

Penyata ini adalah cetakan komputer tiada tandatangan diperlukan
Penyata ini adalah dianggap tepat jika tiada maklumbalas dalam tempoh masa 14 hari dari tarikh penyata

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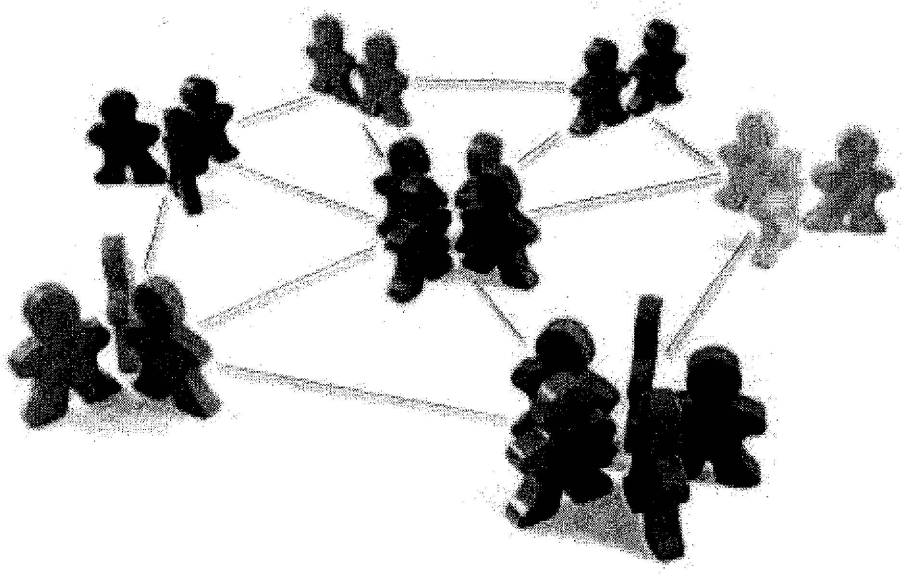
Creating an Entrepreneurial Ecosphere within Higher Education Institutions: Towards a Model of Entrepreneurial University



Prepared By:
Assoc Prof Dr Noor Hazlina Ahmad
Assoc Prof Hasliza Abdul Halim
Prof T Ramayah

Creating an Entrepreneurial Ecosphere within Higher Education Institutions: Towards a Model of Entrepreneurial University

Abstract

In recent times, the propensity to establish a reciprocal association between universities and industries through an interchange of knowledge is becoming greater. In developing countries, the perception of academicians in entrepreneurial universities, however, is mixed. The main objective of this paper is to look into the factors that could contribute towards advancement of an entrepreneurial university paradigm in a developing country in Asia. This study carried out a survey among academicians who are currently employed in fifteen public and private universities in the country. The findings indicated that the majority of the respondents from public universities believe that their university contains strong elements of an entrepreneurial university. However, a significant difference was observed in the dimensions of an entrepreneurial university in that academics who perceived their university to possess hard core elements of entrepreneurial university are more towards embracing research mobilisation, unconventionality, industry collaboration, university policies, and an entrepreneurial university mission. This study will facilitate government and university authorities to formulate guidelines and policies to propagate and institute the concept of an entrepreneurial university.

1.0 Introduction

The knowledge spillover theory of entrepreneurship proposes that while keeping other things constant, entrepreneurial activity will be inclined to a greater extant in contexts where investments in new knowledge are comparatively high (Acs, Audretsch, & Lehmann, 2013; Acs, Braunerhjelm, Audretsch, & Carlsson, 2009). Entrepreneurial activity does not encompass merely the arbitrage of opportunities, but it also takes into account the formation and utilisation of new ideas assumed by institutions (Acs et al., 2013). The formation of new knowledge opens up new prospects (Levidow, Birch, & Papaioannou, 2013) and these new prospects will gradually progress towards establishing a knowledge based economy. However, the matter of fact is that awareness of progression towards a knowledge based economy is not similar throughout the globe because still in some regions it started less than a decade ago, especially in developing countries (Afzal & Lawrey, 2012). As of late, researchers have started discussing the promotion of a knowledge based economy with an advancement of entrepreneurial university (Bercovitz & Feldman, 2006). The presence of the knowledge filter advocates that only investments in research at universities will not serve the spillovers required to engender economic growth. The universities are required to be more entrepreneurial in nature to enable knowledge spillovers for commercialisation out of the universities (Audretsch, 2014). Scholars argued that entrepreneurial opportunities based on using knowledge spillovers will also be greater as knowledge investments (Acs et al., 2013). However, the extent of knowledge investment has the potential to lead towards a knowledge economy (Cai & Liu, 2015; Guerrero & Urbano, 2014). In the contemporary knowledge economy, the entrepreneurial university was seen as a vital force that drives the economic growth of a nation along with the proliferation of innovation and creativity (Fayolle & Redford, 2014). According to Guerrero and Urbano (2014), the entrepreneurial university may possibly be considered to be an exhaustive knowledge milieu and a source of entrepreneurial opportunities by the university community. Furthermore, scholars have also outlined that an entrepreneurial university is a natural incubator providing support structures for teachers and students to commence new ventures with an amalgamation of intellectuality and commercialisation (Fayolle & Redford, 2014). Recently, there has seen a shift in research towards the 'entrepreneurial university' model, especially in developed countries (Czarnitzki, Grimpe, & Pellens, 2014). This trend touched through the Asian region as well, especially in some of the developing countries (Chan & Mok,

2015). Having noted that, there are still some gaps that exist which inhibit a comprehensive understanding of the university-industry relationship (Geuna & Muscio, 2009; Kalar & Antoncic, 2015). This may perhaps be able to fit with the context of the Asian countries, amongst which, Malaysia is one. Malaysia opted to transmute and shape its path for advancement with the facilitation a knowledge based economy rather than an input driven economy (Goh, 2005). Furthermore, governments around the globe are urging universities to embrace the exemplar of entrepreneurial university and Malaysia is no exception to it. Therefore, along with the government's determination, some of the universities in Malaysia are shifting from a long-established organic approach, towards a more interventionist top-down push approach that represents the concept of an entrepreneurial university (Gibb, Haskins, & Robertson, 2013; Philpott, Dooley, O'Reilly, & Lupton, 2011).

However, this transference by the universities on the road to this third mission is divergent among few academic disciplines as a menace to the central objective of a university, which is, teaching and research (Philpott et al., 2011). In such a paradox, it is imperative to comprehend the state of the entrepreneurial university concept among Malaysian universities. The existing research indicated to possess certain features of entrepreneurial university. Based on the extensive literature on the entrepreneurial university concept, this study categorised the rudiments of entrepreneurial universities into hard and soft elements. Presence of hard elements signifies more orientation towards entrepreneurial university and existence of soft elements indicates lower inclination towards the concept of entrepreneurial university. Therefore, the main objective of this study is to identify the difference of the entrepreneurial university initiatives among the two types of classifications, i.e. soft and hard elements. In doing so, an empirical discriminant analysis was attempted to get a clear picture on the state of entrepreneurial university in Malaysia. Additionally, the result generated from this study will enable integration of essential issues that are needed to be taken into account by the government and university authorities.

2.0 Literature Background

Scholars have labelled the augmentation of entrepreneurial university as a second academic revolution in the world of academia (Etzkowitz, 2014). In this regard, scholars contended that

an entrepreneurial university will allow a transferal of knowledge and technology across the industry, develop industrial park, regional and local engagement, creation of public value (Gibb et al., 2013) and acknowledged to bring financial benefit to the universities (Phan & Siegel, 2006). As said by the scholars, an entrepreneurial university decides to be engaged in entrepreneurial activities by including and out-spreading the concept of a research university (Ahmad, Halim, Ramayah, & Rahman, 2013; Etzkowitz, Webster, Gebhardt, & Terra, 2000). The conventional mission of the university was to transfer and advance knowledge through rudimentary research. Together with teaching and research, the entrepreneurial university adopts the third mission of contributing to economic development (Fayolle & Redford, 2014; Philpott et al., 2011). The initiation of the 'entrepreneurial university' brings out dual obligation for the higher educational institution, to produce new knowledge and also to transfer technology and knowledge spillovers (Audretsch, 2014). The effort of becoming an entrepreneurial university, however, contends to mark a big difference in the society as a whole (Taylor, 2014). Previous literatures denoted that the concept of an entrepreneurial university came across few obstacles in certain developed countries, which is popularly known as European Paradox (Dosi, Llerena, & Sylos Labini, 2005). This paradox was ascribed to: (a) lack of entrepreneurial spirit among scientists, (b) poor intellectual property rights to university inventions, (c) differing legal systems between nations that inhibit cross border technology transfer. However, in general there are other internal and external factors that limit the materialisation of an entrepreneurial university. Major internal factors include: limited time due to classes or administrative work, limited financial resources, lack of infrastructure, delay in fund management, and lack of skilled personnel. In addition to that, major external factors are: increasing capital costs, inadequate government funds, difficulty in private sector collaboration, dearth of expert research and development personnel, and a lack of supplementary services to support research and development (Yusof & Sapuan, 2008).

In the domain of entrepreneurial university, scholars have recommended to focusing on research mobilisation, unconventionality, industry collaboration, university policies as the dimensions which explain the entrepreneurial orientation of an entrepreneurial university (Todorovic, McNaughton, & Guild, 2011). In addition, it is also significant to consider the issue of 'academic' in context of the entrepreneurial university.

Mobilisation refers to the shift of orthodox knowledge management heading for a system that facilitates knowledge formation and innovation at an individual or organisational level (Hasan & Crawford, 2007). According to Todorovic et al. (2011), research mobilisation implies that an involvement of external stakeholders at all stages, overtly on the research outcomes that can be easily comprehensible and exchangeable among the concerned stakeholders. Research mobilisation conceivably can be seen under the concept of knowledge mobilisation (Todorovic et al., 2011), which aims to support the creation and integration of the most effective knowledge available to enhance certain outcomes (Lowry, 2014). Conventionally, knowledge mobilisation refers to the diffusion and endorsement of research knowledge in policy or practice. More recent conceptualisations of knowledge mobilisation refers to the multidirectional exchange of knowledge between diverse stakeholders (Nichols, Phipps, & Johnstone, 2014).

Unconventionality embraces pursuing for research funding sources other than the collaboration with non-academic professionals (Abou-Warda, 2015). According to Todorovic et al. (2011), unconventionality implies the extent of exploring new opportunities that are beneficial for the stakeholders. In the literatures of entrepreneurial university, pursuing forward for new opportunities have also been considered as a platform in enabling the transformation of conventional knowledge towards innovative activities (D'Este & Perkmann, 2011). As stated by Riviezzo and Napolitano (2013), unconventionality indicates the ability to determine new opportunities other than a conventional academic environment, highlighting more on unconventional approaches in research funding and problem solving.

According to Abou-Warda (2015) industry collaboration refers to the involvement of departments, faculty, and students with the related industry, since such collaborations result in greater research performance. Furthermore, industry collaboration deliberates the degree of teamwork with industry at individual and organisational levels (Riviezzo & Napolitano, 2013). More precisely, Todorovic et al. (2011) delineated that existence of industry collaboration drive department, faculty, and student to be involved with the related industry. It was claimed that entrepreneurial universities are progressively appearing more as proactive managers of the collaboration with industry, pursuing to create valuable Intellectual Property (IP) (Bruneel, d'Este, & Salter, 2010). According to D'Este and Perkmann (2011), collaboration with industry offers a leverage to the entrepreneurial university in order to approve and encourage entrepreneurial activities among researchers in a university.

University policies denotes the understanding of the authoritative personnel regarding the central policies of a university and the degree to which they face possible obstructions in their innovative and unconventional actions (Riviezzo & Napolitano, 2013). In a similar way, Todorovic et al. (2011) mentioned that that university policies represent the departmental perception on the initiatives of university policy and objectives with regards to the recognition of innovative ideas.

An important dimension needed to be considered for entrepreneurial orientation is 'Academic' in the context of an entrepreneurial university. Incorporating entrepreneurship courses at the university level for students and encouraging them to participate in entrepreneurship related activities is an important aspect. While vowing for an entrepreneurial university concept, Gibb et al. (2013) and Gibb and Hannon (2006), suggested to include an entrepreneurship course in the student's curriculum, innovative pedagogical support for departments, along with active participation of students in entrepreneurial activities.

Entrepreneurial university mission is one of the important issues for the establishment and progression of an entrepreneurial university. The university that contains the mission of entrepreneurial activities carries out a diverse range of range that is not only limited to the basic research. According to Audretsch (2014), entrepreneurial university broadens its research outline from basic research to applied research and spillover mechanism. Entrepreneurial university undertakes the required activities to establish it as entrepreneurial minded.

Based on the above discussion, the study, contends that those universities, which embrace certain activities presumed to be more entrepreneurial, are considered as more inclined towards the nature of an entrepreneurial university. However, in these regards, those that possess a greater extent of specific elements that are central to the entrepreneurial university characteristics are considered as hard elements. Nevertheless, some of the elements are not a representation of hard core entrepreneurial university characteristics, therefore, are considered as soft core characteristics of an entrepreneurial university. They are obvious facts that those universities possess hard core elements entrepreneurial university are more dominant in the dimensions of entrepreneurial orientation. Therefore, there is a significant distinction between hard and soft core universities, which contains entrepreneurial characteristics and activities.

3.0 Methodology

The current study mainly attempted to carry out statistical discriminant analysis, which basically identifies the quantitative variables or predictors that best discriminate between hard and soft type entrepreneurial university better than chance. Furthermore, to reveal a wider insight into the views towards the dimensions of entrepreneurial universities between the two types, independent sample t-test was also conducted. In addition, the study performed cross-tabulation within the university types (public and non-public) and the extent of entrepreneurial university (hard and soft elements). The independent sample t-test was carried out with statistical package SPSS version 21.

In this study, there were a total of nine hard elements and sixteen soft elements. If either one of the nine/sixteen elements were found in the responses, the responses were categorised to be in the group of hard/soft entrepreneurial university. The empirical survey was conducted on faculty members of both public and non-public universities in Malaysia. The measurement was adopted from Todorovic et al. (2011). A total 433 usable responses were used in the study for analysis of which, 250 responses were from universities that contain either one of the nine hard elements and 183 responses from the universities that contain either one of the soft elements of entrepreneurial university. The following are the elements of hard and soft core entrepreneurial university (Table 1).

Table 1: Elements of entrepreneurial university

Type of Elements	Elements
Soft	• Strategic vision statement on entrepreneurship • Entrepreneurship academic division • Entrepreneurship as subject • Entrepreneurship integrated in core requirements • Entrepreneurship courses for non-business majors • Ongoing curriculum innovation, development of innovative pedagogies and teaching • Student-led entrepreneurship initiatives • Alumni incorporated as speakers and guest academics

	• Consultancy-directly selling academic expertise to external organisations • Extension education focusing on corporate/social/family entrepreneurship • Entrepreneurship research center with funded research program • Large-scale research grants from external sources • Entrepreneurship activities center • Networking events for entrepreneurs • Entrepreneurship student club(s) • Business plan competition
Hard	• Patenting and Licensing • Links to successful entrepreneurs, business angels, and venture funds • Business incubator • Science or technology parks • Spin-off firms formation • Technology transfer office • Entrepreneurship endowed chair • Innovation and commercialisation office

4.0 Findings

To ensure that there is no common method bias in the questionnaire survey, we performed Harman's single factor test. The results revealed that the first factor accounted for 34.95% of variance that is less than the threshold level of 50% of total variance as proposed by Podsakoff and Organ (1986) and therefore there was no response bias found in the data set. Furthermore, the total variance explained by the 46 factors was 64.007 and is well above the prescribed specification of 50 percent. Since a single factor did not emerge and the first factor did not account for most of the variance, this study concludes that the common method bias was not a major concern in this study.

In the second step, the independent two-group unpaired t-test was carried out to determine the possibility of differences between the two groups that possess soft and hard elements of entrepreneurial university. The assumptions of carrying out two-group unpaired t-test are: 1) applied to two independent groups, 2) sample size from the two groups may or may not be

equal, 3) the data is from a normal distribution, 4) standard deviation (SD) is approximately the same in both groups, and 5) t-test compares the means of the two groups of data - the test determines whether the data come from the same population or not. In this study, 183 responses possess either one of the elements of soft entrepreneurial university and 250 responses contain hard elements. A total of 8 variables were included in the study and the results are given in Table 2. It is worthwhile to mention that out of eight variables, seven variables show significant differences at 1% level between soft and hard and the 95% confidence interval for mean difference shows that the value of zero does not fall within the interval for these seven variables.

Table 2. Independent samples t-test

Variables	Type	Mean	Std. deviation	t-value	Sig. (2-tailed)	95% Confidence Interval of the Difference	
						Lower	Upper
RM	Soft [a]	3.678	0.676	-5.071	0.000	-0.410	-0.181
	Hard [b]	3.973	0.537				
UC	Soft	3.531	0.694	-6.276	0.000	-0.510	-0.267
	Hard	3.919	0.547				
IC	Soft	3.728	0.663	-6.396	0.000	-0.488	-0.258
	Hard	4.101	0.548				
UP	Soft	3.484	0.827	-4.544	0.000	-0.489	-0.194
	Hard	3.825	0.690				
EUM	Soft	3.483	0.797	-4.168	0.000	-0.438	-0.157
	Hard	3.780	0.635				
EFF	Soft	3.140	0.900	-3.627	0.000	-0.461	-0.137
	Hard	3.439	0.771				
EIF	Soft	3.071	0.954	-3.398	0.001	-0.493	-0.132
	Hard	3.383	0.938				
AC	Soft	3.641	0.706	-1.951	0.052	-0.282	0.001
	Hard	3.781	0.762				

Note: a=number of sample is 183; b=number of sample is 250

RM= Research mobilisation, UC= Unconventionality, IC= Industry Collaboration, UP= University policy, EUM= Entrepreneurial University Mission, EFF= Environmental Formal Factor, EIF= Environmental Informal Factor

Next, the main purpose of the study, which is the discriminant analysis, was carried out. According to Hair, Black, Babin, and Anderson (2009), the purpose of discriminant analysis is to determine statistically whether there are differences in the average score of a variable for two groups. Through discriminant analysis, researchers determine which of the variables accounts for most of the difference in the average score. Since this study focuses on two groups, discriminant analysis will be applied to see which variables play the most important role based on their average score. Referring to the Table 3, the canonical correlation, which measures how strong a relationship is with a value of more than 0.5 indicating a strong relationship. When we square the canonical correlation value, we will get the percentage of variance explained in the dependent variable, which in this case is: 0.081 (0.285^2).

Table 3. Canonical Correlation

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.088[a]	100.0	100.0	.285

a. First 1 canonical discriminant functions were used in the analysis.

The Wilks' Lambda tests the eigenvalue of the discriminant function when there is more than 1 function. In this case (Table 4), since we have only 2 groups, we have only 1 function and the eigenvalue is significant ($\chi 2 = 23.241$, $p<0.01$).

Table 4. Wilks' Lambda

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	.919	23.241	8	.003

As shown in the Table 5, we have 3 classification hit ratios, the first one is the classification with all the data that we have, which is called the original classification. The second one is called the cross-validated classification. In the cross-validated classification, the analysis will leave one case out at a time and run the analysis. The third one is the hit ratio when we use the holdout sample.

Next what we need to do is to assess the hit ratio, which is actually a measure of the classification accuracy that may range from 0% of all respondents wrongly classified to 100% of all respondents correctly classified.

Table 5. Classification Results

Classification Results [a,b,d]

				Predicted Group Membership		Total
			HardSoft	Soft	Hard	
Cases Selected	Original	Count	Soft	115	66	181
			Hard	35	65	100
		%	Soft	63.5	36.5	100.0
			Hard	35.0	65.0	100.0
	Cross-validated [c]	Count	Soft	113	68	181
			Hard	40	60	100
		%	Soft	62.4	37.6	100.0
			Hard	40.0	60.0	100.0
Cases Not Selected	Original	Count	Soft	2	0	2
			Hard	55	95	150
		%	Soft	100.0	0.0	100.0
			Hard	36.7	63.3	100.0

a. 64.1% of selected original grouped cases correctly classified.

b. 63.8% of unselected original grouped cases correctly classified.

c. Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.

d. 61.6% of selected cross-validated grouped cases correctly classified.

Table 6 presents the univariate ANOVA test and the test indicates that the 2 groups differ significantly for all 8 independent variables. The Wilks' Lambda scores on the discriminant function were between 0.936 and 0.980 for the 8 variables. Seven variables were found to be statistically significant at 1% level only for one variable significant at 5% level. UC had the smallest Wilks' Lambda, which means it contributes more to the discriminant function. Overall, the Wilks' Lambda for the model was at 0.919 with $p < 0.01$ (see Table 4 Wilks' Lambda). The mean value of all 8 independent variable was higher for those who are hard as compared to those who are soft (see Table 8, Group Statistics for mean values).

Table 6. Test of Equality of Group Means

Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
RM	0.939	18.243	1	279	0.000
UC	0.936	19.187	1	279	0.000
IC	0.948	15.186	1	279	0.000
UP	0.960	11.623	1	279	0.001
EUM	0.969	8.897	1	279	0.003
EFF	0.972	8.127	1	279	0.005
EIF	0.966	9.691	1	279	0.002
AC	0.980	5.818	1	279	0.017

Note: a=number of sample is 183; b=number of sample is 250

RM= Research mobilisation, UC= Unconventionality, IC= Industry Collaboration, UP= University policy, EUM= Entrepreneurial University Mission, EFF= Environmental Formal Factor, EIF= Environmental Informal Factor

Table 7 reports the test for homogeneity of covariance, which is one of the assumptions that needs to be tested for the discriminant analysis. This is tested with Box's M test, which tests null hypotheses that the group variance-covariance matrices are equal. The test indicates that there is a significant difference in the covariance of the 2 groups ($F = 1.587$, $p < 0.05$).

Table 7. Test of Equality of Group Covariance

	Box's M	59.125
F	Approx.	1.587
	df1	36
	df2	145611.818
	Sig.	.014

Tests null hypothesis of equal population covariance matrices.

The Table 8 summarises the mean and standard deviation for the 2 groups, i.e. those who are hard and those who are soft.

Table 8. Descriptive Statistics

Group Statistics

Elements		Mean	Std. Deviation	Valid N (list wise)	
				Unweighted	Weighted
Soft	RM	3.683	0.675	181	181
	UC	3.539	0.691	181	181
	IC	3.736	0.661	181	181
	UP	3.496	0.815	181	181
	EUM	3.485	0.801	181	181
	EFF	3.144	0.902	181	181
	EIF	3.088	0.944	181	181
	AC	3.646	0.708	181	181
Hard	RM	4.018	0.537	100	100
	UC	3.896	0.581	100	100
	IC	4.036	0.531	100	100
	UP	3.823	0.677	100	100

	EUM	3.762	0.626	100	100
	EFF	3.450	0.779	100	100
	EIF	3.446	0.881	100	100
	AC	3.860	0.716	100	100
Total	RM	3.803	0.649	281	281
	UC	3.666	0.675	281	281
	IC	3.843	0.633	281	281
	UP	3.612	0.783	281	281
	EUM	3.584	0.754	281	281
	EFF	3.253	0.871	281	281
	EIF	3.216	0.936	281	281
	AC	3.722	0.717	281	281

Note: a=number of sample is 183; b=number of sample is 250

RM= Research mobilisation, UC= Unconventionality, IC= Industry Collaboration, UP= University policy, EUM= Entrepreneurial University Mission, EFF= Environmental Formal Factor, EIF= Environmental Informal Factor

Functions at group centroids display the mean for the groups that are in standardised form (Z score), which is based on the weighted linear combination making up the discriminant function. These values will be used to calculate the cutting score, which is used to establish a cutting point for the purpose of classification. The cutting score is needed to establish a cutting point as we can see from Table 9, if the variate calculated is less than –0.220, then a group will be classified as soft whereas if the variate is greater than 0.398, a group will be classified as hard.

Table 9. Group Centroids

Functions at Group Centroids	
Hard/Soft	Function
	1

Soft	-0.220
Hard	0.398

Unstandardised canonical discriminant functions evaluated at group means

Finally, to get a clearer picture on the state of entrepreneurial university in Malaysia, the cross-tabulation suggests that 71.1% of the respondents from the public university consider their university to possess hard elements of entrepreneurial university. Whereas 63% of the respondents from the non-public university considered themselves to hold the elements of soft elements of entrepreneurial university characteristics.

Table 10. Cross-tabulation

University Type * Hard/Soft Cross tabulation

University Type	Hard/Soft		Total
	Soft elements	Hard elements	
Public University	76	187	263
Non Public University	107	63	170
Total	183	250	433

5.0 Discussion and Conclusion

This study investigated the possible difference between two types of entrepreneurial university based on the dimensions of entrepreneurial orientation in the educational institution. Transference from the research oriented to entrepreneurial orientated university is now been considered as one of the important paradigm shift in the educational system. However, based on the types of activities carried out by the universities, represent the degree of entrepreneurial undertakings. This study categorised the soft and hard elements of entrepreneurial universities based on the activities pursued by the respective universities. Taking up such intention to explore, this study carried out empirical research on the faculty members from 15 public and non-public universities in Malaysia.

The discriminant analysis indicates that there is significant difference between the soft and hard core entrepreneurial universities in Malaysia in terms of research mobilisation, unconventionality, industry collaboration, university policies, entrepreneurial university mission, environmental formal factor, and environmental informal factor. Whereas, in terms of academic, there is no significant difference between the two groups. Universities those possess the hard core elements of entrepreneurial university, suggestively differs in these dimensions compared to those who contains soft element of entrepreneurial university.

The universities which are more inclined towards the entrepreneurial activities contains few features with greater extant which facilitated them to become a symbol of entrepreneurial university in Malaysia. The study indicated that 57.7 per cent of the surveyed responses consider their universities as exact representation of entrepreneurial university. Therefore, it can be infer that these universities do practice and establishes certain activities which demonstrates the greater extant of entrepreneurial university. For example, patenting and licensing was considered as representation of hard core entrepreneurial university. Linking with successful entrepreneurs in the society and establishing business incubator are highly practiced among majority of the Malaysian universities. Further, these universities are greatly influenced to set up science or technology parks within the periphery of the university. Along with these, spin-off firm's formation was seen as vital to be the entrepreneurial inclined university. In this context, it is an assertion of the study that establishing technology transfer office and entrepreneurship endowed chair are considered as vital to become entrepreneurial orientated university. Embracing all these characteristics, hard core entrepreneurial universities also institutes innovation and commercialisation office within the university so that the outcome of the entrepreneurial initiatives should not be in vain. Therefore, it is suggestive that a majority of the universities in Malaysia possess characteristics of entrepreneurial universities that drive them to carry out entrepreneurial activities that are presumed to be driven by the greater entrepreneurial orientation.

On the other hand, just including the entrepreneurship courses in the curriculum does not symbolise the extent of entrepreneurial university. Universities must look also beyond just insertion of entrepreneurship courses. Further, it was validated by this study that some of the universities in Malaysia still could not embrace the exact characteristics of true entrepreneurial universities. The possible reason might be due to the fact these universities are limited to

certain activities that are not the effective actions for entrepreneurial university. Some of the Malaysian universities only are limited to embracing only the strategic vision statement on entrepreneurship, entrepreneurship academic division, and entrepreneurship as subject. Furthermore, limiting only entrepreneurship in core requirements, entrepreneurship courses for non-business majors, bringing in alumni incorporated as speakers and guest academics does not represent to be an entrepreneurial university. To be an entrepreneurial university, far needs to be done, which yet not been carried out in few universities. It is an assertion that if a university limit itself within only networking events for entrepreneurs, may not also symbolises the entrepreneurial university. In addition, large-scale research grants from external sources, business plan competition, entrepreneurship student club(s), and entrepreneurship activities center should be not be emblem of entrepreneurial university. However, the study clinches that if these mentioned activities are taken and practiced by the universities, it is rather better to consider them as soft core entrepreneurial oriented university. In this case, there are far wider scope to develop themselves to be more entrepreneurial orientated.

A noteworthy variance was revealed in context of research mobilisation among the hard and soft core of entrepreneurial university. Universities which contain the elements of hard core, presumably inspire their graduate students to be engaged in research mobilisation through encouraging students in the research, which has implications on the industry. The hard core entrepreneurial oriented university believes that cooperation with organisations outside the university significantly improves the research activities of the universities. Faculty members of the Malaysian universities that contain the hard core elements of the entrepreneurial university believe that their university should build relationships with private or public sector organisations. It is avowal of the study that university-wide policies at the university contribute substantially towards the university achieving its goals and objectives. However, publishing scientific papers as well could be an essential representation of hard core oriented entrepreneurial university in Malaysia. It is also relevant to mention that support for the technology transfer as environmental formal factor plays vital role to become more inclined towards entrepreneurial university concept. The study also understands that creating a favourable attitude among the students towards the entrepreneurship is a significant environmental informal factor to become an entrepreneurial university.

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Most importantly, the study has also suggested that public universities are more inclined towards the activities of entrepreneurial university. Due to the alignment with the government policies, source of finding and due to the ownership and management structure, public universities are facilitating to become entrepreneurial university in nature. On the other hand, due to the ownership structure, lack of funding, and mind-set of operating university discourage the non-public university to become entrepreneurial university.

The current study validated the previous avowal by the researcher that to align the universities with the entrepreneurial university mind-set, transfer of technology in collaboration with the industry is rather an significant matter to be considered (Ernest, Matthew, & Samuel, 2015). As mentioned by Yusof and Sapuan (2008), it is also an assertion of this study that it is important to have a robust and effective leadership, which will enable the transformation towards an entrepreneurial university. In future, researcher may look into the relationships between the entrepreneurial university orientations with the performance of the university with regard to the extent of inclination towards the entrepreneurial university. Still, the field of research in this context have not saturated yet. Especially in the developing country like Malaysia, it is believed there are plenty of scope of research to delve into the prospects and problems of entrepreneurial university.

6.0 Conclusion

It was stated at the outset that Malaysia is devoting itself to a greater extent towards fostering a knowledge economy that would be a decisive developmental approach. It is assumed that to withstand the advancement, it is imperative to highlight the knowledge that can be collaborated with the industry. However, it is still important to establish the entrepreneurial mind-set among faculty members, researchers, and students to become more inclined towards entrepreneurship. Furthermore, through requisite financial support for research and development, universities can advance further to become a total entrepreneurial university. It is not so far, embracing such practices in Malaysia, the country could become a center of the Asian entrepreneurial activities.

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