CONTRIBUTIONS OF THAI RESEARCH UNIVERSITIES TOWARDS THAILAND BECOMING KNOWLEDGE BASED SOCIETY

Tenzin Rabgyal

A Dissertation Submitted in Partial
Fulfillment of the Requirement for the Degree of
Doctor of Philosophy (Development Administration)
School of Public Administration
National Institute of Development Administration
2013

CONTRIBUTIONS OF THAI RESEARCH UNIVERSITIES TOWARDS THAILAND BECOMING KNOWLEDGE BASED SOCIETY

Tenzin Rabgyal

School of Public Administration

Professor S. Thamrong ..... Major Advisor
(Sombat Thamrongthanyawong, Ph.D.)

The Examining Committee Approved This Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy (Development Administration).

Professor Supachai Yavaprabhas ..... Committee Chairperson
(Supachai Yavaprabhas, Ph.D.)

Professor S. Thamrong ..... Committee
(Sombat Thamrongthanyawong, Ph.D.)

Assistant Professor Kasemsarn ..... Committee
(Kasemsarn Chotchakornpant, Ph.D.)

Professor Nisada Wedchayanon ..... Dean
(Nisada Wedchayanon, Ph.D.)

February 2014

ABSTRACT

Title of Dissertation	Contributions of Thai Research Universities Towards Thailand Becoming Knowledge Based Society
Author	Mr. Tenzin Rabgyal
Degree	Doctor of Philosophy (Development Administration)
Year	2013

Universities are one of the core and main pillar in building the nation towards Knowledge Based Society (KBS). However, the importance of creating a KBS, the nation higher education system needs to be at par with globally standards. The key factors that contribute in building the nation towards KBS by the higher educational institutions include Governance, Culture, Innovation, Research, Infrastructure, and Information Communication and Technology (ICT). Sharma et al, (2008) study framed four pillars of the knowledge society: Infrastructure, Governance, Human Capital and Culture.

In Southeast Asia, approximately 300 million people's lives depend on products and knowledge from the Mekong Subregion. In this region, there are more than 840 public and private universities and colleges. Among all, Thailand plays important role in Mekong Subregion in all expect of development. Thailand is positioning itself as an education hub in the Southeast Asian region as well as building the nation as a KBS. In 2009, Office of the Higher Education Commission (OHEC), Ministry of Education, Thailand categorized their higher education institutions in four clusters namely research university, specialized university, undergraduate-based university and community university.

However, there are growing challenges for the Thai universities, which are not only internal but also contributed from external factors. Many of these challenges are not considered fully by the local public universities as they have opted to ask for additional funds from the State to keep the competitive pressure. Furthermore, the Thai education system does not sufficiently react to labor market needs, which have altered radically by rapid growth. Especially higher education institutions, face new and diverse challenges in regards to access, equity and quality. Thai educational quality has been improving but still lagged behind the international standard.

Therefore, it is very significant to study the factors that influence the Thai Higher Education sector's contribution in building nation towards KBS. The guiding research question for this study is to what extent factors such as human capital, governance, academic quality, culture, research, innovation, infrastructure, and ICT, contributes Thai higher education instituions in building nation towards KBS and its impact. The objective of the study is to investigate the relationship between the factors and their possible impacts on the KBS. In addition, the definition of the related factors, indicators and the measurement for this research are described in details and also three hypotheses are developed. Mixed method is applied for this research to support qualitative by quantitative data. The degree of the influence levels were tested by the statistical results from the questionnaires. Purposive sampling technique was used for qualitative method and convenient sampling for the quantitative method. The target populations of this study are the policy and decision makers for purposive sampling and two groups of respondents from 9 Research Universities for the convenient sampling.

The finding indicates that human capital produce from Thai universities needs to have the capabilities and capacities (Competency) to find new knowledge area. This is supported by quantitative analysis which shows significant contribution for the KBS. Result suggested that the research universities needs to gear more focus on the levelling up their faculty members to be more up to date needs of the country development as well as clear understanding of university contribution towards KBS. Based on the expert's opinion on the Contribution of Thai university's towards KBS, the study found the degree of high and low in regards to the University Competence and University Compliance.

Path analysis was conducted to identify a casual pattern of these variables. These casual relationships are explained as direct and indirect effects. The result indicates that the Contribution of University is directly affected by Human Capital, Research, Culture, Infrastructure, Academic Quality and ICT. Governance and Innovation factors are indirectly influence the Contribution of Universities towards Thailand becoming KBS.

The finding from the qualitative and quantitative indicates that six factors are major contributors of university towards Thailand becoming a KBS. In this regard, this study recommended six factors are main pillar in building the country toward KBS and in addition, government policy and the involvement of corporate sector, international non-organization; local non-government organization and the local community are very important. Therefore, study recommended that policy and decision makers to involve all the stakeholders to be part of the policy development. Study also recommended that in framing the policy, primary education institutions play a very important for the country development and for the KBS.

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to Prof. Sombat Thamrongthanyawong, for his kindness, patience as well as giving me his full support and encouragement throughout the lengthy process of this study. I am very thankful to my dissertation committee Chair Prof. Supachai Yavoprabhas and Dr. Kasemsarn Chotchakornpant for their valuable comments and suggestions in completing this dissertation. I also would like to express my sincere thanks to all the experts who have provided me their opinions and suggestions. My thanks also go to all the faculty members and students from nine research universities spending their time filling up my questionnaires. With great appreciation I thank Dr. G.V.R. K Acharyulu, University of Hyderabad, India for external assessment of my dissertation.

My indebtness would be incomplete if I fail to mention the help in the form of encouragement and support provided by my friend Mr. Karun Kumar and his wife Mrs. Shashi Kumar and also my four brothers: Venerable Khenpo Kalsang Tenpa, Choesang, Chemi and Kunchok. The assistance provided by the GSPA-NIDA staff members especially from Khun Orapin and Khun Ladawan is greatly acknowledged.

In addition, the completion of this dissertation achieved not only by the endeavour, devotion, strong will, but also from encouragement, kind consideration and advice, which I received from people around me over the years. I owned all of them a great debt for their efforts, kindness and devotion. I wish them all the best in life and in their own good work. I am indeed very grateful to my well-wishers and colleagues at AIT especially Mrs. Namita for her encouragement and help. Finally, I dedicate this dissertation to my parent, my sibling, my uncle, my in-laws, my wife (Boonthathip) and two sons (Norbu and Woeser), for their support, inspiring, and motivating in all my endeavours and understand about taking their time to this study. They were tirelessly patient and encouraged me throughout this period of my study.

Tenzin Rabgyal

February, 2014

TABLE OF CONTENTS

LIST OF TABLES

Tables **Page**

LIST OF FIGURES

Figures **Page**

CHAPTER 1

INTRODUCTION

1.1 Introduction

In Asia, there have been rapid changes in many sectors, which influenced the livelihood of millions of people. In this context, knowledge is proved instrumental tool for individuals as well for organizations and nations to develop skills and ensure continued growth, capacity building and sustainable development. Mårtensen (2000) argued that in order to remain at the forefront and maintain competitive edge organizations must have a good capacity to retain, develop, organize, and utilize their employee competencies. Therefore, it is important to handle knowledge as an extremely critical factor for an organization's future survival in a fierce and competitive industrial environment. For that reason the education sector, especially Higher Education Institutions (HEIs) plays very critical role in producing knowledge workers for any organizations whether it is corporate, governmental, or non-governmental. Knowledge workers are not only educated and skillful assets of their organization but also to the country as they contribute and add value through their experiences, continuing education, research and training (Perisco and Morris, 1997; Drucker, 2002; Hofheinz, 2009; Giudice et al., 2012; Ryan et al., 2012).

It is important for HEIs whether they produce knowledge citizens based on market driven supply keeping in view of innovative economy. Experts, academicians, academic leaders and the central and local government of many countries for years have debated on the role of HEIs in producing knowledge. Should they go for the excellence, or to serve the public to gain the knowledge? If they worked toward excellence, then what about the weaker ones, who have no ability to excel in their area or rather, support the smarter to enhance the capacity and capability of the organization in competing in the dynamic market. These have been issues for the HEIs to resolve.

HEIs are the knowledge creators, knowledge propagators and also a knowledge builders as well as production firm of knowledge workers (Clark, 1983; Gumport & Pusser, 1999; Drucker, 2002; Kenway et al., 2004; Seong et al., 2005; Blasi, 2006; Osuna, 2008; Kefela, 2010; Gürüz, 2011; Geenhuizen & Nijkam, 2012). As well, it brings transformation to individuals and helps leapfrogging in country's political, social and economic developments. Higher education has been the major driving force in transforming individuals, fostering growth and it holds the key to local and global economic and social development and as well as generate revenues and values for the country development (Meulemeester & Rochat, 1995; The World Bank, 2000; Presmus & Sanders, 2003; Drucker & Goldstein, 2007; Woollard et al., 2007; Li et al., 2008; Andersson et al., 2009; Blewitt, 2010; OECD, 2010a; OECD, 2010b).

In the development of higher education, both the public and private universities are the two main drivers. The private business owners or corporate bodies own private universities, while some of the public universities supports with funding from the State and some are partly funded (Smith, 2011; Rhoten & Calhoun, 2011; WIPO, 2007). Universities are the places where innovative knowledge or innovative economy are grown-up and establish the needs of the new knowledge areas. They produce knowledge workers in the dynamic knowledge world. The policy of university education is to provide knowledges and skills to the potential leaders, researchers, managers, technicians and others to operate in a competitive global labour market by the knowledge economy. This policy is not only supported by the local universities but also gained support from the local government/agencies and other international organizations such as United Nations Educational, Scientific and Cultural Organization (UNESCO), World Bank (WB), Organization for Economic Co-operation and Development (OECD), Islamic Development Bank (IDB), Asian Development Bank (ADB), Association of Southeast Asian Nations (ASEAN) and others that have declared that the education is a cause, consequence and symptom of globalization and modernization. However, there are "demands that changes in the university curricula to produce a new kind of worker with the ability to adapt to a changing labour market" (Arambewela, 2010).

Universities are one of the core and the main pillar in moving the nation towards Knowledge Based Society (KBS). The knowledge society paradigm demands the HEIs to be more accountable to society (Beerkens, 2008; Altbach et al., 2011). It is also the main driving force for pushing countries towards KBS and engine for country development. At global level, higher education contribution toward the country development is of immense importance (Rantz & Tangchuang, 2005; Johnstone & Marcucci, 2010; Ramady, 2010; Ishengoma, 2011; Istaiteyeh, 2011).

In realizing the importance of creating a KBS, the nation higher education system need to have a par with global standard, where real values of any society is contained within its human capital (Wood, 2003; Melguizo, 2011). Human capital is the central pillar in the development of KBS. The stocks of human capital build mainly through investment in education (Mathur, 1999; OECD, 2000; Talbot & Scott, 2004; Baldacci et al., 2008;) especially in higher education (Blöndal et al., 2002; Buysse, 2002; Alexandre et al., 2012; Eid, 2012). Human capital is the skills and knowledge of people living in the society. Nonaka & Tekeuchi (1995), identified different trait of knowledge and these are Know-what, know-who, know-why, know-how, know-when and know–where. Governance, Culture, Infrastructure, Innovation, Research, Infrastructure and Information Communication and Technology (ICT) are the other factors that contribute by the HEIs in leading the nation towards KBS. Though there are many factors to measure the KBS, however in this study focus is on the above given factors.

In Southeast Asia, approximately 300 million people's lives depend on products and knowledge from the Greater Mekong Subregion (GMS). The Mekong is the river, which originates from Tibet, western part of China. It runs through Yunnan province of China, Myanmar, Thailand Laos, Cambodia and Vietnam (Mekong River Commission, 2006; Pech & Sunada, 2008; Kongthong, 2011; Weightman, 2011). The total population of Mekong region is ~208.6 million and having a gross domestic product per capita ranging minimum 286 US$ (Cambodia) to maximum 1,785 US$ (Thailand). Addition, 60 million population of the Mekong region is directly dependent on the Mekong river basin and approximately 80% basin wide are engaged in agriculture i.e., depend directly on natural resources for livelihood and well-being. For example Mekong basin produces more than half of Vietnam's food such as 50%

of Vietnam fishery, 60% of the country's fruit and ~300, 000 tonnes aqua cultural products: mostly shrimp (Than, 1997; ADB, 2005; ADB, 2006; Brakel et al., 2011).

This region has the potential to be one of the fastest growing region in the world in terms of economic development (ADB, 2005; ADB, 2006; ADB, 2008; ADB, 2011) and infrastructure development. In this regards, HEIs are to play the key role in its development (Brakel et al., 2011; Stone & Strutt, 2010). In this region, there are more than 860 public and private universities and the colleges (57 in Cambodia; 19 in Laos, 150 in Myanmar, 171 in Thailand and 466 in Vietnam). Among all, Thailand play important role in GMS in all aspects of development.

1.2 Rationale of the Research Study

Thailand is positioning itself as an education hub in the Southeast Asian region as well as building the nation as a Knowledge Based Society (KBS). Thailand has been an agriculture based country and now establishing itself towards the knowledge driven country (Thaweesak Koanantakool, 2000). For instance Thailand is one of the top destinies of manufacturing industry such as electronic industry, automobile industry and others. The product standards of these industries are equivalent to the global standard. Taking this opportunity, the Thai government is supporting better education towards it people at the same time Thailand is targeting itself towards the KBS. In this regard HEIs play a very significant and crucial role in producing knowledgeable workers where a nation can move toward KBS.

In addition, Thai government supports the knowledge transfer from overseas to the local firms and organizations. Thai Board of Investment (BOI) provides privileges to investment from overseas in the form of tax incentives, such as by exempting import duty on raw materials, reduction of corporate income tax for manufacturers with a minimum investment of Baht 2 Million (excluding land costs and working capital) and exporting at least 50 percent of their total sales (BOI, 2007). Also the Free Trade Agreement (FTA) with the partner countries, where there is a unilateral reduction of tariffs for key products. These special privileges attracted increased foreign investment in the country, thus assisting in upgrading the product knowledge and standardization of quality in line with the global standard.

Consequently, they need more knowledge workers in their company, organization and institution.

According to Paitoon Sinlarat (2004) the “production of knowledge would also enhance the research conducted in Thailand”. Douangngeune et al. (2005) study resulted that the Thailand educational reserve had a positive effect on agricultural intensification and industrialization, while land endowment and educational investment had a negative effect. Their finding shows that “Thailand failed to mobilize its resource rent for investments in education and other forms of infrastructure during its vent-for-surplus development stage to the extent needed to achieve modern economic growth through agricultural intensification and industrialization”.

In early 2013, Prime Minister of Thailand formulated four strategies for the sustainability and development of the country. These four strategies are:

1) Capacity building to enhance Thailand’s competitiveness for the long run to ensure sustainable development

2) Reduce social disparity between low-income and high-income earners and provide greater opportunities for the people based on economic, social, and political equality

3) Emphasize "green growth economy" and promote people's quality of life.

4) Improve effectiveness in management focusing on good governance.

Moreover, Thailand has become a regional hub for the private sector as well as for the United Nations system in Asia and want to be education hub. In this regards, Thailand planned to produce bundles of semi-skilled and skilled technician and knowledge workers in different industries each year. In addition, the government is also strategizing its development in developing supporting industries and industrial clustered for the various business industries (BOI, 2007). Therefore, it would be worthwhile to study the factors that contribute Thai HEIs in building the nation towards the KBS.

1.3 Problem Statement

Thailand faces challenges as it is counterpart of elsewhere, including the Impact of globalization; Rapid Development of Information and Communication Technology; Environmental Changes; Political and Socioeconomic and Cultural Reforms; the need for Infrastructure Development and urgent need for Human Resources Development.

In Thailand, Ministry of Labour is responsible for the Human Resources Development. Ministry of Labour by the Department of Skill Development (DSD) has been responsible for the development of workforce in the labour market since the age of 15 years old to acquire skills, knowledge to have high competence for employability. In addition, DSD is the core organization for issuing the National Skill Standards and Testing System as well as evaluation the working experiences of workforces and transfer to education credit for higher qualification. According to the Thailand Labour Act 1998, all workers must be aged 15 years or older.

The Ministry of Education (MOE) is responsible for the overall education in Thailand and was established by King Rama V in 1982 B.E. The regulatory Act 2003 of MoE has created the Office of Higher Education Commission (OHEC) to be responsible for the higher education (OHEC, 2012). Under the guidance of MoE, OHEC administers the Public HEIs and oversees the Private HEIs and Community colleges. The OHEC has the authority to formulate higher education policies.

In the beginning, the purpose of Thai universities was to provide civil servants for specific government department (Sippanondha Ketudat, 1972; Watson, 1981; Fry et al., 2013), an amalgamation of the Civil Service College originally a Royal Pages School (1902), an Engineering School (1913), Royal Medical School (1889) and later created Faculty of Arts, Science, and Public Administration.

In spite of initial contempt on Thai efforts by Western scholars (Thompson, 1941) by early ‘80 “Chulalongkorn gained in size, status and scholarship to become the preeminent higher education institution in the country with more than 16,000 students, the cream of the country's secondary school leavers, enrolled in its 7 faculties” (Watson, 1981). As of June 2013, Chulalongkorn has more than 30,000 Students with 19 faculties. Since the establishment of the first university in the

country 88 years ago, higher education in Thailand has progressed remarkably. Higher education divided into 3 levels: lower than bachelor's degree or diploma level, bachelor's degree level and graduate level. For the last few decades, the numbers of Thais attaining the higher education degrees have been increasing. From Table 1.1. below shows that 4.9 million working Thais attained the higher level of education in year 2006 and the number has increased to 6.6 million in the year 2012. This indicates that there is a higher supply of well-educated workers to further economic development and move Thailand towards KBS and to raise the competitiveness of the country as levels of skill tends to rise with educational attainment.

In 2009, OHEC categorized Thai universities and colleges in four clusters namely research university, specialized university, undergraduate-based university and community colleges (OHEC, 2009a). As of 2013, Thailand has 171 HEIs: 80 Public HEIs; 71 Private HEIs and 20 community colleges (OHEC, 2012).

In Thailand, a major challenge confronting the education system of the country is not so efficient use of resources because of lack of sufficient or limited public expenditure on education. Also, there are growing challenges for the Thai universities, which are not only internal but also contributed from external factors which leads to educational institutions to reform or restructure their organization or re-engineering their structure, management, curriculum development and course offering according to the market needs. The Public and Private HEIs might not consider many of these challenges fully as they have opted to ask for additional funds partly from the State or funds from private organizations to keep of the competitive pressure.

Table 1.1 Employed Persons by Level of Education Attainment: Jan 2006-Dec. 2012 ("000")

Level of Education Attainment	In Thousand						
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
None	1,258.61	1,227.48	1,114.98	1,128.23	1,138.53	1,135.41	1,315.62
Less than Elementary	12,161.58	11,597.55	11,450.09	11,323.80	10,799.85	10,483.45	9,902.88
Elementary	7,782.98	8,254.06	8,439.75	8,520.30	8,700.23	8,711.71	8,973.74
Lower Secondary	5,061.12	5,320.95	5,620.10	5,792.01	5,965.45	6,149.15	6,288.16
Upper Secondary	4,261.96	4,522.46	4,755.44	5,029.37	5,260.43	5,418.93	5,655.63
- General/Academic	3,094.86	3,326.24	3,544.81	3,730.62	3,951.76	4,093.49	4,378.69
- Vocational	1,153.05	1,182.22	1,196.84	1,285.06	1,297.08	1,310.10	1,262.59
- Teacher Training	14.06	14.00	13.80	13.69	11.59	15.34	14.35
Higher Level	4,975.35	5,157.24	5,486.63	5,801.02	6,042.97	6,443.09	6,652.61
- General/ Academic	2,670.34	2,808.78	3,032.63	3,252.65	3,400.92	3,691.24	3,910.96
- Vocational	1,459.75	1,593.24	1,699.07	1,783.54	1,874.01	1,965.18	2,049.77
- Teacher Training	845.26	755.22	754.93	764.83	768.05	786.67	691.87
Others[1/]	24.84	30.64	27.71	26.38	35.07	35.82	33.19
Unknown	159.10	139.08	121.92	85.21	94.81	87.12	119.31
TOTAL	**35,685.53**	**36,249.46**	**37,016.61**	**37,706.32**	**38,037.34**	**38,464.67**	**38,941.12**

Source: National Statistical Office, Thailand, 2013.

Douangngeune et al. (2005) found that the educational stock had a positive effect on agricultural intensification and industrialization, while land endowment had a negative effect on these variables as well as on educational investment. Their results seem to support the hypothesis that Thailand failed to mobilize its resource rent for investments in education and other forms of infrastructure during its vent-for-surplus development stage to the extent needed to achieve modern economic growth through agricultural intensification and industrialization. Their result recommended that it is important to recognize that Thailand did not entirely neglect investment in education and other infrastructure for modern economic development during its vent for- surplus development stage.

Furthermore, the Thai education system does not sufficiently react to labour market needs, which have altered radically with rapid growth (Paitoon Sinlarat, 2004; Rantz & Tangchuang, 2005). Especially higher education institutes, they face new and diverse challenges in regards to access, equity and quality. Compared to the last five decades, Thai educational quality has been improving but still lagged behind the international standard (World Bank, 2009). According to The Nation (2009), “Schools and colleges in Thailand fail to keep up with international standards”.

As evidenced by the recent wearing away Thailand's competitive edge in low technology manufacturing, wage rises ranging from 6 to 8 percent per annum in the early and late 1990s outstripped labour productivity growth. In addition, if the government did not consider the improvement of the skilled labour, there would be losing of employment. For instance, if the local government does not concentrated on the improvement of skill of the workers working in the electrical and electronics industry, Thailand may risk losing its status of manufacturing hub in ASEAN (Bangkok Post, 2012a).

National Statistical Office (NSO), under the Ministry of Information and Communication Technology finding of population survey showed that the Thailand population of the working group has been increased 32.1 Million in 2001 to 38.9 Million in 2012. This working group is from 15 to 59 years. This growing trend in the working group demands to have a proper education system at the same time needs of high caliber and expertise for the human resource development of the country. The report of May 2012 by NSO, it shows that in first sixth months of 2012, 359,000

people are unemployed, 50% of them are having a graduate degree (Wannapa Khaopa, 2012).

In addition, there is growing interest of foreign investments in Thailand because Thailand will become one community under the ASEAN Economic Community (AEC) by 2015. Foreign investments need more knowledge workers and shortage of workers in Thailand “will not be able to cope up with the expected rise in foreign investment” (Sucheera Pinijparakarn, 2013).

Therefore, Education is the “most critical challenges for the country's future competitiveness” (Bangkok Post, 2012b). In addition, Thailand needs to build a strong foundation, strengthen, and enhance their competitiveness of educational institutions in the region. In addition, Thailand would like to be an education hub, pressing the universities to be more proactive as well growing influence of other Asian countries in the world, universities are playing an important role in creating the knowledge economy. This led to local universities to focus more to get better support and the traditional concept of government support to the local support. Thus, universities in Thailand need to incorporate in order to support the development of a knowledge society. The Thai government is supporting for the education hub and to be the KBS.

Angsana Techatassanasoontorn et al., (2011) argued, “Thailand’s infrastructure challenges include unequal development across regions, a small skilled workforce, and low R&D expenditures in the ICT sector. Future economic growth of Thailand will depend on an increase in investments and improvement in technology and innovation”. Furthermore, there is limited study factors Contribution of the Thai HEIs sector toward the KBS. Therefore, it is very significant to study the factors that influence the Thai Higher Education sector’s ontribution towards Thailand becoming KBS.

1.4 Research Objectives

The guiding research question for this study would be to what extent factors (such as human capital, governance, culture, research, innovation, infrastructure, and Information and Communication Technology) impact on the Contributions of Thai Universities in building nation towards KBS. The objective of the study is to investigate the relationship between the factors. The specific objectives are:

1) To explore the concept and charecteristics of KBS in the context of Thailand.

2) To study the role of Thai research universities in building nation toward KBS.

3) To examine the impact of factors Contribution of Thai universities in building nation toward KBS.

1.5 Research Scope

The purpose of this research study is to examine the Contributions of Thai Higher Education Institutions in building nation towards KBS and the study is focused on nine research universities of Thailand classified by the of OHEC, MoE, Royal Thai Government in the year 2009. These nine universities are:

1) Chiang Mai University;
2) Chulalongkorn University;
3) Kasetsart University;
4) Khon Kaen University;
5) King Mongkut University Thonburi;
6) Mahidol University;
7) Prince of Songkla University;
8) Suranaree University of Technology
9) Thammasat University.

In this study, concentrations of purposive sampling (the perception of education policy makers and officials, decision makers) is on the decision and policy makers of above nine Thai research universities. In regards to the convenient sampling, the researcher concentrated on faculty members, research staff and students (master and doctoral students) from these nine research universities.

1.6 Dissertation Organization

The dissertation presented in seven chapters and is as follows:

1) Chapter 1 provides the introduction of the study, problem statement, purpose and scope of the research, research question and objectives.

2) Chapter 2 includes the background on Thailand and its Higher Education sector.

3) Chapter 3 includes the literature review related to this study especially the factors such as knowledge based society, higher education, human capital, governance, culture, research, innovation, infrastructure and information and communication technology. The conceptual framework and hypothesis also included in this chapter.

4) Chapter 4 includes the research methodology including research design, data collection and data analysis of this study.

5) Chapter 5 address the analysis of qualitative data addressing the first and second objective of this study.

6) Chapters 6 provide the results and discussion on the relationships between various factors and address the third research objective of this study. This chapter also further supports the finding from the chapter 5.

7) Chapter 7 concludes the findings, theoretical and practical implications of the study, and proposes directions for future research.

CHAPTER 2

THAILAND AND HIGHER EDUCATION

This chapter provides an overview about Thailand and Thai government policy towards higher education and includes other development such as industrialization.

2.1 Thailand

Thailand is one of the friendliest and safest travel destinations in the world. The opening of Suvarnabhumi Airport in 2006 gives capital city of Thailand (Bangkok) ample room to continue growing at its recent historical average of 8% per year (second only to Beijing's 13% growth rate in all of Asia), and the opportunity to reinforce its position as Asia's premier airline hub. The overseas investors recognize the strength of Thailand's economy and the expansion of the domestic market as important reasons to invest in Thailand, both in terms of servicing the Thai market and in using transportation linkages to wider regional markets, as well as using Thai production to supply GMS and ASEAN countries. The following table 2.1 shows the vital statistic of Thailand.

Thailand also possesses a clear advantage when it comes to wage levels. According to UBS (2012), Bangkok's 2012 gross wages rank cheapest only ahead of Manila and Jakarta among regional hub contenders, at an index value of 14.6 compared to the New York benchmark of 100. By comparison, Taipei's and Hong Kong's wages are over 3 times higher, Kuala Lumpur's and Shanghai's are 0.6 as high.

Excluding rents, Bangkok's living costs fall near the median at a gross index value of 55.3 (again, against New York's 100). Among regional contenders, Hong Kong's living costs are highest at 73.1 followed by Taipei (63.1), Shanghai (56.1), Manila (41.5) and Kuala Lumpur (52.0). On balance, as reckoned by A.T. Kearney's

Global Services Location Index, Thailand among the top ten: low cost of doing business: ranked 7th in Asia: Vietnam and Philippines are in 8th and 9th ranked respectively (Atkearney, 2011).

Table 2.1 Thailand Statistics, 2013.

#	Items	Statistics	Sources
1.	Size	513.1 thousand sq.km	
2.	Population	66.79 Million	
3.	Growth of Urban Population	4.8 percent per year	
4.	Population Density	130.30 persons per sq. km	
5.	Gross Domestic Product Value	365.5 billion US dollar	
6.	GDP Growth Rate	6.4 percent	
7.	Youth Literacy Rate	98 percent	The World Bank
8.	Infant Mortality Rate	12 per 1000 live birth	(2013)
9.	Access to Improved Water Source	53% of total population	
10.	Carbon Dioxide Emission	7.0 Million metric tons	
11.	Energy Use	448 per capita kg of oil equivalent	
12.	Electricity Production	4.4 billion kilowatt hour	
13.	Labour Force	39.41 Million persons	Bank of
14.	Balance of Payment	188.8 Billion Baht	Thailand (2013)
15.	Life Expectancy	74.3 years	
16.	Government Spending on Education	3.8 percent of GDP	UNDP (2013)

Thailand is one of the strongest economies in Southeast Asia and continues to be among the faster-growing economies in the region, with GDP growth rates of at least 5 percent from 2012-2014 and the real GDP is expected to grow by 5 percent in 2014. Thailand has a tropical climate, as it is located in Southeast Asia and shares borders with Myanmar, Laos, Cambodia and Malaysia, as well as the gulf of Thailand

and the Andaman Sea. Known as The Land of Smiles, Thailand may be unsurpassed in hospitality to guests. The following table 2.2 shows the strength and weakness of Thailand.

Table 2.2 Strength and Weakness of Thailand

Strengths	Weaknesses
✓ Stable macroeconomic	✓ Lack of technological readiness
✓ Sound monetary and fiscal policies	✓ Low per capita income
✓ Stable prices and level of employment	✓ Weak saving and poor investment volume (limited access to capital and capability of income generation)
✓ Strong diversification of sectorial industries	✓ Less progress in science and technology
✓ Large domestic market	✓ Less investment in research and development
✓ Strong Labor market	✓ Political instability
✓ Good Infrastructure	✓ A lack of specialization between institutions regarding the type of teaching and learning mainly “academic” (research based) or vocational (“professions” based)
✓ Easiest and most comfortable locations in Asia	✓ The size of the institutions and subunits thereof (faculties, departments) are too small (too many programs with no critical mass, therefore higher unit costs and lower quality)
✓ Mutual trust and respect,	✓ lack of language skill especially English
✓ Tolerance for others’ beliefs,	✓ An exaggerated regionalization due to political pressure
✓ Ethical conduct in all aspects,	
✓ Treating others with dignity,	
✓ Respect for cultural diversity	

Sources: Andrew and Sununta Siengthai, 2009; Chaiyakorn Kiatpongsan, 2011; National Economic and Social Development Board (NESDB), 2012.

The capital city, Bangkok, serves not only as the administrative head of the country, but also as the nation's cultural, commercial and educational center. Bangkok is a thriving metropolis of more than 10 million people and serves as a shipping, transportation and financial hub for mainland Southeast Asia. Bangkok's central location and active role in regional trade have allowed it to develop with a cosmopolitan, diverse atmosphere while maintaining a culture that is uniquely Thai. Bangkok used to be known as the "Venice of the East" due to its extensive network of canals. Although today some of the Klongs (as the canals are known) have been replaced by roads, they still provide a chance to see parts of Bangkok where life continues at a quieter pace with floating shops, wooden houses and flower-lined canals. The Bangkok city awarded the "World's Best City" fourth consecutive year in the world by Travel & Leisure magazine in 2013 (Bangkok Post, 2013). In addition the capital city of Thailand is among the top 10 in the Global Destination Cities Index published by MasterCard in 2013 and also world's two most –photographed locations on Instagram (Hedrick-Wong & Choog, 2013). Jorgensen (2009) provided fifty (50) reasons why Bangkok is number one (1) world's greatest city.

Furthermore, many of the most proactive ecology, agriculture, development and medicinal studies of Southeast Asia are happening in Thailand. Many study abroad programs capitalize on this trend and project such as 'first antibody against all dengue virus type'. This is the recent collaboration between Japan and Thailand (Mahidol University). "It was the first time such an antibody was produced using a secondary-infected acute-phase patient's blood, a major success factor for high-quality antibody production" (JICA, 2013). This drug would help to save millions of life as each year 100 million peoples infected by dengue in more than 100 countries.

There are other international organizations and globally known universities are collaborating with Thai Universities such as MIT collaboration with Chulaborn Research Institute (CRI) in biological engineering research and Chulalongkorn University partnership with Oxford University and other well-known universities in the world. Other Thai research universities well connected with the international organizations and universities (Kantatip Sinhaneti, 2011). In addition, Thailand hosts various international organizations and institutions such as United Nations, Asian Development Bank, European Commission and Asian Institute of Technology.

2.2 Thailand Competitive Index

The World Economic Forum publishes the annual Global Competitiveness Index (GCI) and is a comprehensive tool in measuring the microeconomic and macroeconomic foundation of country competitiveness. The GCI report grouped the competitive index in 12 pillars (Schwab & Salai-i- Martin, 2013). This 12 grouped are based on the three sub-indexes and these are: Basic Requirement, Efficiency Enhancers and Innovation and Sophistication factors. Table 2.3 shows the ranking of Thailand in comparison with the five countries.

Table 2.3 Ranking Based on the Sub Indexes of GCI: 2010-2013

	Countries	**Overall Competitiveness**			**Basic Requirement**			**Efficiency Enhancers**			**Innovation and Sophistication**		
#	Years	'13-'12	'12-'11	'11-'10	'13-'12	'12-'11	'11-'10	'13-'12	'12-'11	'11-'10	'13-'12	'12-'11	'11-'10
1.	Thailand	38	39	38	45	46	48	47	43	39	55	51	49
2.	Singapore	02	02	03	01	01	02	01	01	01	11	11	10
3.	Malaysia	25	21	26	27	25	33	23	20	24	23	22	25
4.	China	29	26	27	31	30	30	30	26	29	34	31	31
5.	Japan	10	09	06	29	28	26	11	11	11	02	03	01
6.	South Korea	19	24	21	18	19	23	20	22	22	17	18	18

Source: Schwab, 2011a-2001b; Schwab, 2012; Schwab & Salai-i- Martin, 2013.

The basic requirement is the key for 'Factor-Driven' economies', 'Efficiency Enhancer' is key for Efficiency-Driven Economies and Innovation and Sophistication factor is key for 'Innovation –Driven' Economies. From the above table, it shows that Thailand is ranked 38th in terms of global competitiveness among the 144 countries.

However, as compared to Singapore, Malaysia, China, Japan and South Korea, Thailand is still behind in terms of global competitiveness including the sub factors such as basic requirements, efficiency enhancers and innovation and sophistication factors.

The table 2.4 present the ranking of Thailand in 12 pillars of **GCI** and compared with five countries namely, Malaysia, Singapore, China, Japan and South Korea. The first two countries are from Southeast Asia and the remaining three are from the East Asia. These countries have scaled up their economy and gear towards global competitive countries. The ranking of Thailand competitiveness has improved in four pillars last three years. These pillars are Macroeconomic Environment; Good Market Efficiency; Financial Market Development and Business Sophistication. In regards to higher education, Thailand ranked 60th in terms of competiveness of higher education and training globally in 2013. As compared to the five countries, Thailand is still behind and there is space for the improvement of Thailand Higher education sector. In regards to the Technology readiness and innovation, Thailand is ranked 84 and 68 respectively in the year 2013.

Table 2.4 Comparison of Ranking of Thailand with Five Countries in 12 Pillars of Global Competitive Index 2010-2013

#	Years	Thailand	Malaysia	Singapore	China	Japan	South Korea
				Institution			
1.	2012-2013	77	29	01	50	22	62
	2011-2012	67	30	01	48	24	65
	2010-2011	64	42	01	49	25	62
2.	2012-2013	46	32	02	48	11	09
	2011-2012	42	26	03	44	15	19
	2010-2011	35	30	05	50	11	18

Table 2.4 (Continued)

#	Years	Thailand	Malaysia	Singapore	China	Japan	South Korea
			Macroeconomic Environment				
3.	2012-2013	**27**	35	17	11	124	10
	2011-2012	**28**	29	09	10	113	06
	2010-2011	**46**	41	33	04	105	06
			Health and Primary Education				
4.	2012-2013	78	33	03	35	10	11
	2011-2012	83	33	03	32	09	15
	2010-2011	80	34	03	37	09	21
			Higher Education and Training				
5.	2012-2013	**60**	39	02	62	21	17
	2011-2012	**62**	38	04	58	19	17
	2010-2011	**59**	49	05	60	20	15
			Good Market Efficiency				
6.	2012-2013	**37**	11	01	59	20	29
	2011-2012	**42**	15	01	45	18	37
	2010-2011	**41**	27	01	43	17	38
			Labor market efficiency				
7.	2012-2013	76	24	02	41	20	73
	2011-2012	30	20	02	36	12	76
	2010-2011	24	35	01	38	13	78
			Financial Market Development				
8.	2012-2013	**43**	06	02	54	36	71
	2011-2012	**50**	03	01	48	32	80
	2010-2011	**51**	07		57	39	83
			Technologies readiness				
9.	2012-2013	84	51	05	88	16	18
	2011-2012	84	44	10	77	25	18
	2010-2011	68	40	11	78	28	19

Table 2.4 (Continued)

#	Years	Thailand	Malaysia	Singapore	China	Japan	South Korea
				Market Size			
10.	2012-2013	22	28	37	02	04	11
	2011-2012	22	29	37	02	04	11
	2010-2011	23	29	41	02	03	11
				Business Sophistication			
11.	2012-2013	**46**	20	14	45	01	22
	2011-2012	**47**	20	15	37	01	25
	2010-2011	**48**	25	15	41	01	24
				Innovation			
12.	2012-2013	68	25	08	33	05	16
	2011-2012	54	24	08	29	04	14
	2010-2011	52	24	09	26	04	12

Source: Schwab, 2011a-2011b; Schwab, 2012; Schwab & Salai-i- Martin, 2013.

2.3 Industrialization

In Thailand where agriculture is an important sector of employment, the participation rates are also high among those who completed primary or lower than primary education since job opportunities for unskilled workers can be easily found. Industrialization had significant effects on the employment in the agricultural sector when it was started in the 1960s. Nonetheless, 1997 financial crisis that began in Thailand had a reverse effect. From 1993 to 1996, the number of workers in the agricultural sector decreased from 15.87 million to 13.95 million, a decline on the average of 642,326 persons annually. During the crisis in 1997, the number of workers in the agricultural sector increased to 14.14 million people. The main reason is because of the crisis many workers moved from the non-agricultural sector back to agriculture (Mephokee, 2003). Figure 2 shows the increasing trend of employment in

various industries from 2001 to 2012. The numbers in figure 2.1 are derived from table 2.5.

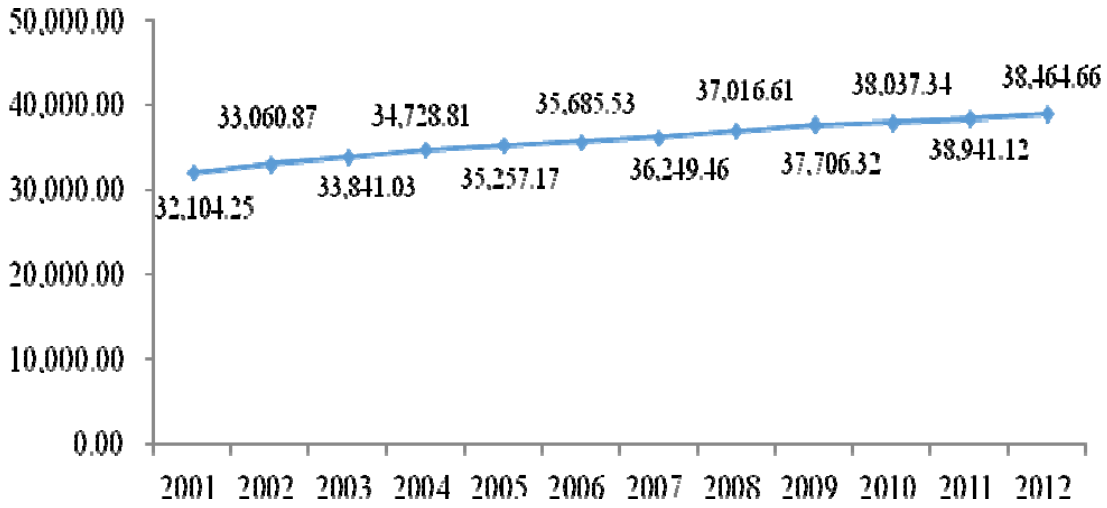


Figure 2.1 Growth of Total Employment from 2001 to 2012 (“000”)

Sources: National Statistic Office, Thailand, 2013.

Tables 2.5, below shows that the 36.4 million Thais are employed in year 2006 and the number has increased to 38 million in the year 2012.

In addition, 13.6 million Thais employed are under 15 year old by end of 2012. In regards to the persons not in labour force (age 15 year above), the number has increase 14 Million in 2006 15.1 Million in 2012. On the other hand, population age under 15 has dropped from 14.8 Million in 2006 to 13.3 Million in 2013. Approximately, 39 percent of Thailand's labor force is employed in agriculture. Rice is the country's most important crop; Thailand is the largest exporter in the world rice market. Other agricultural commodities produced in significant amounts include fish and fishery products, tapioca, rubber, corn, and sugar. Exports of processed foods such as canned tuna, canned pineapples, and frozen shrimp are on the rise (Ashvin et al., 2006; Watchaneeporn Setthasakko, 2012).

Thailand's increasingly diversified manufacturing sector is the largest contributor to the growth. Industries registering rapid increases in production included

computers and electronics, furniture, wood products, canned food, toys, plastic products, gems, and jewelry. High-technology products such as integrated circuits and parts, hard disc drives, electrical appliances, vehicles, and vehicle parts are now leading Thailand's strong growth in exports (Ashvin et al., 2006; Watchaneeporn Setthasakko, 2012).

Nevertheless, investment in education remains one of critical factor for Thailand. Education sector has received the largest share of total public expenditure for the last decade. Figure 2.2 present the total government budget expenditure on education. Figure shows that the government expenditure on education has been increasing.

Table 2.5 Population by Labour Force Status for Whole Kingdom: 2006 – 2012 ("000")

Labour Force	2006	2007	2008	2009	2010	2011	2012
1.Population (1.1 + 1.2) 1/	65,280.23	65,739.96	66,320.50	66,879.44	67,275.50	67,583.56	67,891.96
1.1.Age Under 15 2/	14,809.30	14,695.46	14,417.62	14,062.67	13,813.49	13,579.60	13,377.93
1.2.Age 15 Up	50,470.93	51,044.50	51,902.89	52,816.77	53,462.02	54,003.96	54,514.03
2.Labour Force (2.1 + 2.2 + 2.3) 3/	36,429.01	36,941.98	37,700.39	38,426.76	38,643.48	38,921.50	39,408.99
2.1.Employment /	35,685.53	36,249.46	37,016.61	37,706.32	38,037.34	38,464.66	38,941.10
of which underemployment /	577.93	596.71	507.78	604.93	520.81	383.58	348.08
2.1.1.Agriculture	14,170.51	14,306.01	14,699.12	14,692.55	14,546.88	14,883.10	15,433.58
2.1.2.Non-Agriculture	21,515.02	21,943.44	22,317.50	23,013.79	23,489.64	23,581.55	23,507.54
2.2.Unemployed Persons	551.73	508.48	521.98	572.33	402.18	264.34	259.09
(rate of unemployment)	1.52	1.38	1.39	1.50	1.04	0.68	0.66
2.3.Seasonal Inactive Labour Force	191.75	184.05	161.80	148.10	203.96	192.50	208.79
(share of total labour force)	0.53	0.51	0.44	0.39	0.53	0.50	0.53
3. Persons not in labour force, age 15 years or over	14,041.93	14,102.52	14,202.50	14,390.01	14,818.54	15,082.45	15,105.30
1) Household work	4,519.47	4,568.23	4,658.10	4,669.95	4,723.72	4,649.35	4,556.90
2) Studies	4,337.03	4,340.44	4,229.76	4,198.83	4,232.78	4,317.27	4,243.74
3) Too young / old / incapable of work	4,254.82	4,335.73	4,322.56	4,467.72	4,580.57	4,745.08	4,713.38
4) Others	930.60	858.13	992.08	1,053.52	1,281.47	1,370.75	1,591.29
4. Persons not in labour force, age under 15 years	14,809.30	14,695.46	14,417.62	14,062.67	13,813.49	13,579.60	13,377.93

Source: National Statistic Office, Thailand, 2013.

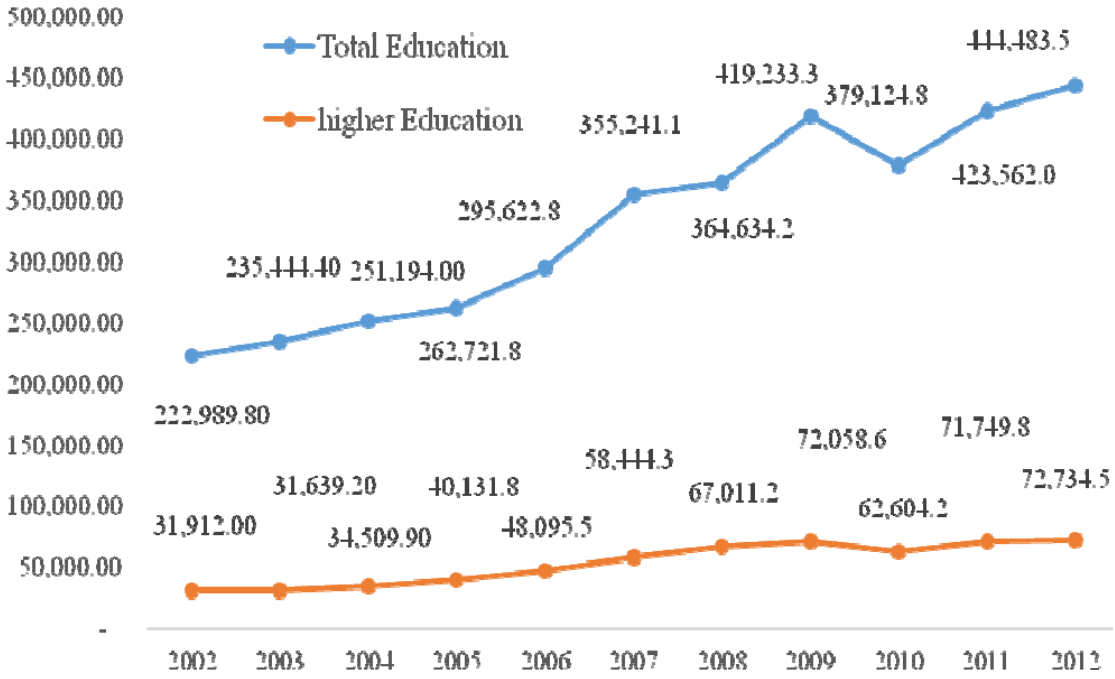


Figure 2.2 Government Budget Expenditure: Fiscal Year 2002-2012 (in Million Baht).

Source: Budget Bureau Office, Thailand, 2013.

2.4 Higher Education in Thailand

In Thailand the responsibility for education administration is mainly under the mandate of six offices of Ministry of Education (MoE), Thailand. The central administrative bodies of the MOE are organized as follows: 1) Office of the Minister; 2) Office of the Permanent Secretary for Education; 3) Office of the National Education Council; 4) Office of the Basic Education Commission; 5) Office of the Higher Education Commission (OHEC); and 6) Office of the Vocational Education Commission. Agencies no (2), (3), (4), (5) and (6) each has a legal status as juristic person and each agency has an administrative status equivalent to a Department. Chief Executive Officers of each agency come under direct command of the MOE. Thailand's higher education both undergraduate and graduate levels fall under the OHEC (OHEC, 2012).

“OHEC is directed by Higher Education Comisssion (HEC). HEC has the authority to propose higher education policies and standards corresponding to the National Economic and Social Development Plan and National Education Plan”; to provide resources support; to carry out follow-up, inspection and evaluation of the higher education management with respect to academic freedom and excellence of each individual degree-granting institution; and to recommend regulations, criteria, and announcement of the administration of the Office (OHEC, 2012).

The OHEC is “empowered to provide recommendations and consultancy to the Minister of Education or the Council of Ministers”. Other authorities of the Board are prescribed by law or as commanded by the Minister of Education. Furthermore the Board has been given the power to propose a block grant for degree granting institutions either public or autonomous universities. OHEC supervise and oversee altogether 171 higher education institutions. OHEC has the “mandate and authority to manage higher education provision and promote higher education development on the basis of academic freedom and excellence” (OHEC, 2012). OHEC have the following mandates (OHEC, 2012):

1) Formulate policy recommendations, higher education standards, higher education development planning and carrying out international cooperation in higher education

2) Devise criteria and guidelines for resource allocation, establishment of higher education institutions and community colleges and providing financial support

3) Coordinate and promote human resources development, to improve student capacity including handicapped, disadvantaged and gifted and talented students in higher education institutions and to coordinate and promote research activities that generate a new body of knowledge for the support of the national development

4) Provide recommendation on the establishment, dissolve, amalgamation, upgrading and closing down of higher education institution and community college

5) Implement higher education monitoring, inspection, and evaluation as instructed by the Commission on higher education and to compile data and information on higher education

6) Serve as the Secretariat to the Commission on Higher Education

7) Perform other functions prescribed by law as authorities and responsibilities of the Commission on Higher Education, and to carry out assignment instructed by the MOE or the Council of Ministers

Thailand's ninth national development plan strongly focuses on the education development with the nine different programs and 7th program was focused on the development of higher education. The Significant policies are:

1) To develop quality of people both academically and professionally with skills necessary for the country, community and local development. Higher education has to instill students to be intellectual, moralistic, ethical while having creative thinking and pursuing a life-long learning in order to build up competitiveness of the country

2) To formulate body of knowledge and local wisdom for capacity building and encourage research and innovation that support economic, social and environmental stabilization. Higher education plays a significant role in solving the country's problem and crisis and also promoting Thailand as regional hub for education.

3) To build a solid foundation for the local and community development that encourages self reliance and responsibility and to be able to catch up with the changing of the world

4) To improve higher education administration system both at governmental and institutional levels that will allow more flexibility and efficiency and enhance quality of higher education and be able to cope with economic, social, political and technological changes. In addition, the private sector and communities are encouraged to play greater role in the delivering of higher education (Office of the NESBD, Office of the Prime Minister)

2.5 Higher Educational Institutions

The higher education history of Thailand could be divided in three periods. The first period is from 1889-1931 (Early Modernization), the second period from

1932 to 1949 (Post Revolution) and the third period from 1950 to present (Development Planning) (OHEC, 2012).

Originally, the role of Thai universities was to provide civil servants for specific government department (Sippanondha Ketudat, 1972), an amalgamation of the Civil Service college (Originally a Royal Pages School (1902), an Engineering School (1913), Royal Medical School (1889) and a newly created Faculty of Arts and Science and Public Administration. Since the establishment of the first university in the country 88 years ago, higher education in Thailand has progressed remarkably. Chulalongkorn University becomes the outstanding higher education institution in the country with 30,000 students, the cream of the country's secondary school leavers, enrolled in its 19 faculties. Higher education is divided into 3 levels: lower than bachelor’s degree or diploma level, bachelor’s degree level and graduate level.

Each public university has its own charter with a University Council as the highest administrative body, directly responsible for the policy and the administration of the university. The chief administrator is the President, or so called Rector, who reports to the University Council. The University Council consists of members as described in charter. The University Council usually comprises two categories of memberships: ex-officio and appointed. The total number of members and the combination of membership categories depend on the mandate specified in the charter of the university (Somrit Yossomsakdi, 1999). All the private higher education institutions are under one common Act of Parliament, the private Higher Education Institutional Act B.E. 2522 (1979). This act allows the OHEC to be coordinating unit between the government and private higher education institutions.

The early 1990s started the period of higher-education expansion in Thailand. More public universities have been established across the country during this period. In the same year, Suranaree University of Technology, located at Nakhon Ratchasima Province, is the first autonomous university under the supervision of the MoE. Therefore Suranaree University of Technology has a different administration system from other civil service system and offers only program from other civil service systems and offers only programs in engineering and technology.

Psacharopoulos & Patrinos, (2002), emphasized that the return to higher education has been increasing over time. While the Thai government has invested "substantial resources in recent years in expanding general secondary education, the new education law enacted in the late 1990s refocuses the energy on improving educational quality" (Fry, 1999).

End of November 2007, the OHEC has approved the 15-year Higher Education Development Plan (2007-2021) which aims to raise the access to and quality of higher education in Thailand. These would help raise the skill levels of future Thai workers, increase innovation and move Thailand towards a knowledge economy (The World Bank, 2009).

With the intense competition, Thai HEIs needs to maintain as well as improve their quality and meet the expectation of the key stakeholders (Sandmaung & Khang, 2013). OHEC imposed all the HEIs to maintain quality and the Thai competitiveness in the regions. As per OHEC requirement, it is mandatory requirement for all Thai HEIs to have internal quality assurance system and comply with the OHEC quality list. There are total of 44 indicators to assess the quality and is grouped in 9 components. These components are 1) Philosophy, mission, objectives and implementation plan; 2) teaching and learning; 3) student development activities; 4) research; 5) academic services to the community; 6) preservation of arts and culture; 7) administration and management; 8) finance and budgeting and 9) system and mechanism for quality (CHE, 2008).

Categories of Thai HEIs

In 2009, Thai government under the Ministry of Education has categorized the Thai HEIs in four different groups. These four different groups are directly under the supervision of OHEC (OHEC, 2012). These four groups are as follows:

As per the government policy, the mandate of the Undergraduate-based universities is to produce high quality of under graduate degree program with "well educated workforce, equipped with the advance knowledge and skills for large scale business entrepreneurs which are the most important driving force for the national development" (OHEC, 2012). These universities may provide the postgraduate degree program.

Community Colleges established in the year 2001 in growing demand of higher education in provincial level. This was mainly to tackle the obstacle of high cost and the distance and the work obligations, where individual are not able to continue their higher studies. These colleges offer various courses including 2-year associate degree program plus the short-term training program. The program includes early childhood education; community development; local government; tourism industry; general management; accounting, computer; business computing; agricultural industry; electricity and auto-mechanic (The World Bank, 2009; OHEC, 2012).

The specializes universities need to provide comprehensive study program in their respective field of study and these are the physical science, biological science, social sciences, humanities and technologies. These universities focus on producing researchers and skill workforces. As per government policy, they have the mandate to play the crucial role in developing the manufacturing and services sectors. Universities under this group can categorize in two types: postgraduate and under graduate degree program.

The Research and postgraduate Universities focus on providing the postgraduate degree program such as master and doctoral degree programs. The focus is especially in producing the doctorate and researchers that will lead national development as well produce brain for the country development. Under this policy, government has selected nine univerities. These nine research universities need to play the lead role in producing research output as well as knowledge workers to serve the community and national demands including enhancing country's competitiveness. The project of research university program was launch in 2009 through OHEC, Ministry of Education, Royal Thai Government with the total budget of 9 billion Baht for 3 years (2010-2012).

OHEC specified following criteria in choosing universities applying to the Development of National Research Universities Project and these are:

1) Must be a university whose name appears no fewer than 500+ times in the database of World University Rankings (THE-QS) of the year 2008.

(1) In case the university does not fulfill Criterion 1, it must have the following research output

(2) Has no fewer than 500 technical publications in the last 5 years cataloged in Scopus

2) Must have outstanding international research in at least 2 out of 5 fields based on THE-QS

3) Must have a faculty staff in which the proportion with doctorate degrees is at least 40%

4) Must be able to identify the uniqueness of being a national research university.The website of the university must be effective and contains up-to-date contents within the database of Office of the Higher Education Commission (Adopted from KMUTT, 2014)

The main concept was to leverage the Thai universities, which has extensive and excellent record of doing and focusing on research. Priorities were for those universities to get recgonized among the world-class universities and became the center of excellence in terms of creating and nurturing new knowledge areas. However, the critieria of identification was unclear.

During the interview with the decision and policy makers of the university, some of the interviewees (Appendix G) opined that to become Research University, the institute needs 75% of thier focus on the research. Nevertheless, in reality, if any university, instead of focusing educating and graduating students, focus primarily on research, possibility is high that number of publications, citations and applying those research outcomes for the benefit of society might drop, thus they will fail by very mission statement of producing knowedge.

This eventually shifted the government priority to other sectors and dilemma prevented a resolution of creation of national research council of Thailand. The interviewees are in view of different expectations of outcomes by universities and policy makers, trying to find a balance with creation of Research University in mind. The policy outlines clustering the universities in four categories and government enventially created budget for nine research universities to focus on their research activities leading toward KBS. Brief notes of these nine research universities is as follows (OHEC, 2012):

1) Chiang Mai University (CMU) was founded in 1964 and located north of Thailand with a focus on engineering, science and agriculture. As of 2013, CMU has expanded its campus in four places with 20 faculties and 1 college in 3 disciplines. Currently, CMU offered 296 degree programs including diploma, undergraduate, graduate degree program. They also offered 14 different multidisciplinary graduate degree programs. The degree program mainly taught in Thai language. However, CMU also offer more than 25 international degree program and 60 different international training courses. CMU is well known in their research, especially in the field of health science (nutrition and diet disease; reproductive health; infectious and tropical disease); social research; and science and technology. CMU is ranked 91 in Asia and 501 in the world as per QS ranking in 2012.

2) Chulalongkorn University (CU) is oldest and first university in Thailand. It was established in 1917. In the beginning CU had four faculties namely Faculty of Arts and Sciences; Faculty of Public Administration; Faculty of Engineering and Faculty of Medicine (Fry et al., 2013). As of 2013, CU is having of 19 faculties, 23 colleges and research institutes with the total students of 38,000 including undergraduate and graduate and 2,800 teaching faculty members. CU ranked 48th among the QS Asian ranking in the year 2013.

3) Kasetsart University (KU) was established in 1943 and was the first agriculture university. In the beginning KU focus on promoting agricultural science and later it has expanded its academic offering in other field such as arts, social science, humanities, education, engineering, and architecture. As of 2013, KU is having a more than 58,000 students enrolled in their seven campuses throughout Thailand. KU has total of 27 faculty and 2 colleges as well as academic staff of 2,829 and supporting staff 6,851.

4) The initiative of establishment of university in northeast of Thailand was carried in 1962 and in 1965 officially Khon Kaen University (KKU) was named by changing former name: University of North East Thailand. As of 2013, KKU has to 22 faculties and colleges and having of 2,200 academic staff; 8,500 supporting staff and more than 40,000 students. They offer total of 340 degree program for undergraduate and graduate degree program plus 43 international programs. KKU served as a leading academic and learning center of the northeastern region.

5) King Mongkut University of Technology Thonburi (KMUTT) was established and founded from the Thonburi College of Technology (TCT) with the objectives of providing training for technicians, technical instructors and technologies related course for the young generation to serve the country development. TCT was the first technological college in Thailand. By 1971 TCT was integrated with other two technical colleges namely North Bangkok college of Technology and College of Telecommunication Technology to become a King Mongkut's Institute of Technology Thonburi and by 1988 it was upgrade degree granting university and called King Mongkut University of Technology Thonburi. As of 2012, KMUTT has total of 16,438 postgraduate (4,772) and undergraduate (11,666) students enrolled. Currently KMUTT have ten faculties/schools. In 2012-2013, The Times Higher Education Asian Ranking, ranked KMUTT as 55th and was the highest ranked among Thai universities.

6) Mahidol University (MU) is well known in the medical field and its origin from the establishment Siriraj Hospital in 1888 and granted it first medical degree in 1893. By 1943, it was named university of medical science and later renamed as Mahidol University in 1969 with great honor by H.M. King Bhumibol Adulyjadej. Currently MU has total of 17 faculties, 6 colleges and 7 research institutes and 9 centers. MU offer wide range area related to medicines, social sciences and applied science. It has total of 3,598 faculty staff, and more than 27,000 students including undergraduate and postgraduate students. MU also offers more than 150 international degree program in undergraduate and graduate. In 2010, MU was ranked 28 in the QS Asian Ranking. However, the ranked has been dropped since last three years: ranked 42nd in 2013; 38th in 2012 and 34th in 2011.

7) Prince of Songkla University (PSU) was established in 1967 and is first university in South of Thailand with the objective to serve southern part of Thailand to assist in the country's economic and social development. As of 2013, PSU is having a total of 30 faculties, 2 hospital and more than 40 excellence and research centers. PSU ranked among top 10 universities in Thailand.

8) Suranaree University of Technology (SUT) is the youngest national research university and was established in 1990 and operated in 1993. SUT is the first

autonomous public university of Thailand. As of 2013, SUT has more than 3000 undergraduate and graduate students enrolled under 9 different cluster of university academic offering.

9) Thammasat University (TU) was established in 1934 and the second oldest university in Thailand. TU was founded by Pridi Banomyong with the guiding philosophy as “to teach students to love and cherish democracy”. Total of 7,094 students were enrolled in the first year to study the law and politics. As of 2013, TU has total of 17 faculty and 7 colleges and institution including Sirindhorn International Institute of Technology. TU has 111 different degree programs in undergraduate; 104 different type of master degree and 22 doctoral degree programs and also 9 certificate degree program. Among all, these programs, 191 degree programs are being offer in Thai program, 24 are English program and 30 international program. TU has more than 33,000 students studying in above given degree program and taught by more than 2,000 faculty members.

2.6 Involvement of Nine Research Universities in Building Nation Towards KBS

Globally, there are more than 6,000 languages and only 30 of them are spoken language. Pegg (2012) listed out the top 25 languages in the world. English ranked number 1. Thai ranked 23 and is spoken by more than 60 million populations.

In most of the Thai HEIs the medium of instruction of degree programs are in Thai language and few universities are offering the degree program in English language. Since last few years, with the support from State, Thai HEIs are providing the degree program in English language. As of 2012, total of 872 international program are offered by public and private universities in Thailand (OHEC, 2012) as shown in table 2.6. Majority of these international program taught are in English language and very few in other language e.g. Chinese or Arabic.

Table 2.6 International Degree Program Offered by Public and Private HEIs of Thailand

#	Program	Public HEIs	Private HEIs	Total
1.	Certificate	011	003	014
2.	Bachelor Degree	127	109	237
3.	Master Degree	250	066	316
4.	Doctoral Degree	177	029	206
	Total	565	207	772

Source: OHEC, 2013.

The offering of international program indicates that Thailand is ready to gear towards Asean Economic Cooperation (AEC) economic integration. In this regard Thailand' HEIs play a very significant roles in contributing towards overall development of Thailand as well moving towards KBS. Thailand's HEIs contribution towards Thailand economic, social and political developments is immense and this has been recognized by Thai people and the State Government. This has been explicitly stated in the government education policy.

> Thai higher education had continuously played an important role in the social and economic development of the country. There is clear evidence of discrepancies of social status between college graduates and that of non-college graduates. At the early stage, universities were established to serve as driving force for the country development as well as regional universities were then established all over the country to accelerate rural development (OHEC, 2009b).

In addition, Thailand national research universities produce quality innovative research. This can be viewed in the study of Narongrit Sombatsompop et al. (2010), where they found that among the 24 public of universities, six of 9 research

universities had a highest average number of research publication and citations. These six universities are MU, CU, CMU, PSU, KU and KKU. “This may be due to fact that these universities have been comprehensive universities throughout the long history of their establishment, and they are relatively larged as compared to the rest of the universities”. There finding is based on the research output recorded in the Web of Science (WoB) database as shown in the following table 2.7. In this table only research universities are included out of 24 public universities.

Table 2.7 Publication and Citation of 9 Research Universities: 2009

University	Published article (2005-2008)	Citation received in 2009	Cited received in 2009	Citation / article	Cited article / published article	Citation received/ Cited article in 2009
CMU	1,390	3,356	896	2.414	0.645 (64.5%)	3.746
CU	2,832	5,827	1,815	2.058	0.641 (64.1%)	3.210
KU	803	1,668	513	2.077	0.639 (63.9%)	3.251
KKU	844	1,797	561	2.129	0.665 (66.5%)	3.203
KMUTT	637	1,211	390	1.901	0.612 (61.2%)	3.105
MU	2,892	7,347	1,954	2.540	0.676 (67.6%)	3.760
PSU	1,019	1,914	621	1,878	0.609 (60.9%)	3.082
SUT	237	441	147	1.861	0.620 (62.0%)	3.000
TU	518	1,085	326	2.095	0.629 (62.9%)	3.328

Source: Adopted from Narongrit Sombatsompop et al., 2010.

From the above table, it shows that total number of published articles of 9 research universities from 2005 to 2008 is 11,172. This figure shows that out of 24 public universities, 87% of the publish articles is from the research universities.

In addition, most of the senior diplomats, beaurocrate, researchers, academician and business executive in Thailand are mostly from these nine research universities. The impact of production of human capital from these nine research universities

cannot measures as there is spin-off effect on the country development and bringing country towards toward KBS. Nation Newspaper listed out 35 most influential people of Thailand last 35 years in 2006 and categorized in 6 fields (The Nation, 2006). Most of these influential are connected with the 9 research universities either they have graduated from one of these universities or attached as academician or partners. In addition, products (human Capital) from these universities are also well known internationally. For instance, Ms. Pirada Techavijit (graduate from KMUTT), will be first Thai to be in Space in the year 2015 (Bangkok Post, 2014).

For instance, the current Prime Ministry of Thailand has graduated from Chiang Mai University. Similar to her other influential people in Thailand such as Khun Anand Paanyarachun; General Prem Tinsulanonda; Dr. Abhisit Vejjajiva; Dr. Samlee Plianbangchang, Mr. Win Lyovarin; Mr. Montien Boonma and Khunying Pornthip Rojanasunand (she is among the top 25 most influential people in forensic science in the world) are products (human capital) of the national research universities. These influential figure opinions and decisions impact on the country development and the contribution towards KBS.

The table 2.8 shows the key facts of 9 research universities as of 2013. From the table it shows that KU has the largest number of students followed by KKU, CMU, CU and MU. In terms of the faculty members, MU has the largest followed by KU, KKU and TU.

Table 2.8 Key Facts of 9 Research Universites

Name	Founded	located	Key Facts as of 2013
CMU	1964	North of Thailand	✓ 38,752 Students ✓ 20 faculties and 1 college in 3 disciplines. ✓ 296 degree programs ✓ Ranked 91 in Asia as per QS ranking in 2012 ✓ 29 International degree program and ✓ 60 different international training courses.

Table 2.8 (Continued)

Name	Founded	located	Key Facts as of 2013
CU	1917	Capital City of Thailand	✓ 38,000 Students ✓ 2,800 Faculty members ✓ 19 faculties, 23 colleges and research institutes ✓ Ranked 48th in Asia (QS Asian Ranking) ✓ 87 International degree program
KU	1943	Capital City of Thailand	✓ 1st Agriculture University ✓ 58,000 students ✓ 2,829 Facutly Members ✓ 6,851 Supporting Staff ✓ 27 faculty , 2 colleges and 7 Campuses ✓ 35 International degree programs
KKU	1962	North East Thailand	✓ 40,000 Students ✓ 2,200 Faculty Members ✓ 8,500 supporting Staff ✓ 22 Faculties ✓ 43 International degree programs
KMUTT	1960	Capital City of Thailand	✓ 16,438 Students ✓ 737 Faculty Members ✓ 1,486 Supporting and Research (122) Staff ✓ 33 International degree programs ✓ Top 5 in Research &Top 10 in Teaching in Thailand ✓ Ranked 55th in Asia (highest among Thai universities) by The Times Higher Education
MU	1943	Capital City of Thailand	✓ 27,000 students ✓ 39 Faculties, colleges, research institutes & centers

Table 2.8 (Continued)

Name	Founded	located	Key Facts as of 2013
			✓ 3,598 Faculty Members ✓ 150 International degree programs ✓ Ranked 42nd in 2013; 38th in 2012 and 34th in 2011
PSU	1967	South of Thailand	✓ 3,000 Students ✓ 30 faculties, 2 hospital and more than 40 excellence and research centers. PSU ✓ 18 International degree programs ✓ Top 10 university in Thailand.
SUT	1990	Central Thailand	✓ 8,883 Students ✓ 366 Faculty Members ✓ 716 Supporting Staff ✓ 9 different cluster of university academic offering
TU	1934	Capital City of Thailand	✓ 33,000 students ✓ 17 faculty and 7 colleges ✓ 2,000 Faculty members ✓ 48 International degree program

2.7 Summary

This chapter explained and discussed about Thailand and its policy of higher education. The competitiveness of Thailand is also compared with other five countries. Chapter explained the policy the higher education policy and evolution of Thai HEIs, and briefed about the 9 Thai research universities.

In the next chapter, the researcher carried out the literature review or previous studies related to this study, which includes contribution of university and its influencing factors that engaged in building country towards the KBS.

CHAPTER 3

LITERATURE REVIEW

This chapter will aim to support the rationale for the study and illustrate the basis for the methodology and tools used to achieve the research objectives. In this chapter, previous studies related to the KBS is examined and identified the factors contributing towards the KBS. It also includes the conceptual framework for this study based on the background.

3.1 Society

After the World War II, scholars and experts attempted to name the society based on different concepts over the period such as post-industrial society, post-modern society, information society, network society, science society, intellectual society, knowledge economy, creative economy, creative society, human security and knowledge society etc. One of the common traits in these conceptions emphasized on the knowledge whether it was social or political or economic or scientific (Bell, 1973; Stehr, 1994; Etxebarria & Uranga, 2004; Kumar, 2005; Graham & Dickinson, 2007; Materu, 2007; Rohrbach, 2007; Beerkens, 2008; Castells, 2010; Angsana Techatassanasoontorn et al., 2011; Ergazakis & Metaxiotis, 2011; Franzen et al, 2012; Hines, 2012;).

All these scholars emphasized the importance and usage of knowledge that can provide better services to the societal development. Knowledge plays the instrumental role for the country development as well as generates income for the country and brings quality in the people's life. Nevertheless, the basic knowledge building went through Knowledge economy to information society and to knowledge society. The phrase knowledge society is not only applied by the academicians, but also acknowledged by the politicians, futurist and decision makers (Zeleza, 2007; Hamid & Zaman 2009).

Knowledge has undergone a process of evolution since earlier civilization. That time it was mainly limited to integration of yet to be proved imagination and compared to current world, logical links were much weaker between hands on knowledge and perceived knowledge. Though the extent of evolution was not uniform, societies nurtured knowledge and passed on through generations, which shaped many dimensions of its tangible and intangible attributes. This perceived knowledge actually became inner strength and helped societies to withstand volatilities as it passed through time.

For instance, societies in Japan have passed knowledge so perfectly that they developed a sense of cohesiveness, discipline, a sense of democracy etc. During Second World War when Japan was devastated with atomic explosion, societies in Japan were able to re-group and re-build of their own even with scarce resources. Knowledge is thus, proved once again that it is an inner strength of the societies and can help them to withstand and excel forward though the journey of humankind.

For any country to move towards KBS, three sectors of society (government, common mass and the political parties) needs to come together and work as collaborators. This would ensure the society to nurture the environment for knowledge to grow and be the inner force for the society. In this regard, the university play an instruemental role in bringing those three sectors togethers through learning process. In this study researcher used the term as knowledge based society.

3.1.1 Knowledge Based Society (KBS)

The charecterisitc of knowledge society is predominance of knowledge learning through higher education institutions, where scientific knowledge are build and shared in the society (Molina, 2008). In knowledge societies the traditional knowledge are reformed and is transformed which address as the needs of society and educate the future generation (Weert, 2005b). In addition, knowledge society nurture urban-regional relationships and enhance closer flow of knowledge among the people (Stimson et al., 2006; Kilper, 2009; Makhloufi, 2013).

The concept of the KBS has been discussed and debated as well as gaining quite a different meaning since it was first used in the 1960s (Beerkens, 2008). In some of the previous studies, knowledge society is referring to information society or

knowledge economy and some argued that the latter could refer to knowledge society because they were the vehicle for the knowledge society and other vehicle were the economic development, social and political factor. According to UNESCO (2005, p. 7), in their report it was stated that “Does the aim of building knowledge societies make any sense when history and anthropology teach us that since ancient times, all societies have probably been each in its own way, knowledge society?”.

Nevertheless, knowledge society should be understood and acknowledged through a holistic approach and not just base on the subject base. In the 21st Century, all nations are moving towards KBS and in this “understanding of knowledge is a central challenge when defining knowledge society” (Spangenberg and Mesicek, 2002).

Nevertheless, most important in the knowledge society is making the most of human capital or assets, as “decisive factors to have a knowledge based economy where economic organizational structures which encourage apprenticeship and knowledge sharing constitute the most important levers for growth and development” (Kefela, 2010). In addition, the creation of KBS will facilitate in trickling down the knowledge from top to grass root level of society and spread its values globally. This brings the transformation in the society and brings new life and helps building new knowledge area and the new society.

In 1966, Lane coined the term “knowledgeable society”, which he stated that its foundational roots in the epistemology and logic of inquiry. In order to support an effort he stated that the society entail to open and allow discussion on all topics without harming the social change. In addition, it has to be solid enough to maintain the order necessary for finding and rich enough to educate its people and dissatisfied or curious enough to want to know more. He also claimed “knowledgeable society is characterized by a relative emphasis upon certain ways to thinking, a certain epistemology or certain knowledge about knowledge”.

Zeleza (2007) argued that the academic explanation of the knowledge society is continually structured in epistemological, sociological and economic terms. In the context of epistemology, the main argument is on the meanings, forms and claims of the knowledge, in which various binaries battle it out of supremacy: social knowledge, explicit and implicit knowledge codified and tacit knowledge and others.

The sociological and economic literatures "tend to focus on the changing relation between science and technology, knowledge and industry, knowledge and information and others". In the study of Elermann et al. (2004) in Australia, they identified the indicators to measure the knowledge society sorted by either a prerequisite for the advancement of the knowledge society or the outcomes of a knowledge society already in existence and these are as follows:

Prerequisites

1. Infrastructure and resources, containing data on media penetration and education;
2. Socio-economics, containing data on individual requirements such as employment, training and skills, and relevant issues such as social inclusion and security; and
3. Politics, containing data on governmental involvement in the development of the knowledge society.

Outcomes

a) Innovation ability, measuring patent applications and research and development expenditures;
b) Work flexibility, containing data on flexible working arrangements such as telework;
c) E-applications, such as e-commerce and e-health, containing data on usage and usage barriers, as well as digital literacy;
d) Wealth and satisfaction, containing data on economic wealth and individual attitude towards work.

UNESCO (2005) defines Knowledge society as one which nurtured by its diversity and its capacities. UNESCO (2005) has developed the indicator of knowledge society (Appendix D) in overall approach. Table 3.1 shows some of the definitions on KBS by different scholars and organization.

Table 3.1 Some of the Definitions on KBS

#	**Definition of KBS**	**Authors/ Organizations**
1.	The society which is characterized by the values of the predominance of creativity and creative activity, as well as the values, which express the generation, spread and use of new knowledge. In the knowledge based society, the underlying interests express the objectives to create, spread and use new products of art, technical, business and other creation , as well as initiate, generate and implement multiple creative ideas and innovations in all areas of life.	Melnikas, 2010
2.	Societies that are well educated, and who therefore rely on the knowledge of their citizens to drive the innovation, entrepreneurship and dynamism of that society's economy	Organization of American States, 2012
3.	Knowledge societies are generally characterized by the ability to create, share and use knowledge for the sole purpose of improving upon the general wellbeing of the people as well as making it possible for them to prosper	Sharma et al., 2008b
4.	A society in which the knowledge sector represents the most significant share of the economy	Rohrbach, 2007
5.	Knowledge Society is one in which institutions and organizations enable people and information to develop without limits and open opportunities for all kinds of knowledge to be mass-produced and mass-utilized throughout the whole society	United Nations, 2005

Sharma et al. (2008a) study framed four pillars of the knowledge society and these are infrastructure, governance, human capital and culture; and added 13 dimensions, which are the building blocks for the knowledge society. These dimensions are 1) geographic proximity to markets; 2) net knowledge inflows; 3) ICT accessibility; 4) rules of law favourable of international norms; 5) intellectual property (IP) regime; 6) political vision and strategy; 7) business environment that reward innovation; 8) higher education; 9) research and development; 10) human rights and freedom; 11) role of mass media; 12) shared Ba (physical and virtual); and 13) knowledge sub-networks. Hamid & Zaman (2009), in their research, indicated that there are total of 45 indicators of human capital dimension in the development of a knowledge society in Malaysia.

In early 1970's Bell (1973) used the term Knolwedge society in relation to the higher Education. According to Bell (1973), states and universities are to play a significant role in knowledge society through openness, flexibility, and fluidity, seeing the state as a facilitator, not as a central planner. Besides, the foundation of knowledge is spilling over mainly from the HEIs (Ace, 2008; Beerkens, 2008; Audretsch et al., 2012; Fukugawa, 2012;).

Mainly universities share and disseminate the knowledge and ideas to the society and it is "the focal point of education and research, and many interests collide at this confluence" (Hermans & Nelissen, 2005). Santiago et al. (2008) categorized the contribution of HEIs to the use of knowledge in the labor market in four broad areas and these are:

1) The building of knowledge base (primarily through research)
2) The creation of capabilities (through teaching and research training)
3) The diffusion of knowledge (through interaction with knowledge users)
4) The maintenance of knowledge (inter-generational storage and transmission of knowledge through codification libraries, database and others)

3.1.2 Higher Education

Higher Education Institutions (HEIs) have been recognized as a key player in western countries as knowledge diffusers, research producer, and innovative inducer

in the development of knowledge societies. HEIs contribution is being more and more recognized in Asia Pacific region for development of knowledge societies (Shi & Neubauer, 2009). Impact of globalization and modernization in the university cannot be operated standalone but must move forward with partnership where they work with a common goal. Therefore, there should be more interaction among the universities from east to west and north to south in sharing or transferring knowledge between the institutions. This can enhance the deeper understanding between universities as well as strengthening the partnership to bring a higher level of cooperation.

In 1998, United Nations Educational, Scientific and Cultural Organization (UNESCO) adopted the 'declaration of global higher education for the twenty first century', which sends the strong message to the countries concerning the status of higher education and its dynamics and impact on the society. This declaration was drafted with the consultations of different organizations in the society world over (UNESCO, 1998). The declaration has highly placed the higher education institutions to be facilitators, innovative centers, peace and prosperous of the country development and the sustainability of educational development.

The world declaration on Higher Education states in its preamble that " [w]ithout adequate higher education and research institutions providing a critical mass of skilled and educated people, no country can ensure genuine endogenous and sustainable development and, in particular, developing countries and least developed countries cannot reduce the gap separating them from the industrial development ones". The Article 1 of the Declaration affirms that "the core missions and values of higher education, in particular the mission to contribute to the sustainable development and improvement of society as a whole, should be preserved, reinforced and further expanded" (UNESCO, 1998).

Giroux (2001), defined higher education is a "public good and an autonomous sphere for the development of critical and productive democracy". The higher education systems vary from country to country depending on their government education policy. Also it has gone through a large number of changes over a period of time. This is mainly due to government support and creating awareness and importance of education to the society as well for individuals. At the same time individual thirst for desiring new knowledge has been increased and also there is need

of higher education degree for their career growth and development. Likewise, globalization and modernization have changed from a service and labor-driven economy based to knowledge–based society where human capital became the institutions or companies or organization's prime asset.

> Rao (2003) stated that “Education is the key to relieving poverty no country has succeeded without educating the people; education is key to sustaining growth and reducing poverty”.

> Rantz & Tangchuang, (2005), mentioned in their book “Globalization and higher education can no longer be considered as separate entities, but must be seen as vitally linked and dependent partners for moving the world forward into new and unchartered frontier”

Additionally, there is a constant need to update and upgrade knowledge, skills and competency because of advanced technology. Society, state and local government do recognize the important role of HEIs in the knowledge society to improve the quality of the public (De Boer et al, 2010). However, they expect HEIs to perform better in more efficient and effective way leapfrog the society toward knowledge society. Higher education is the engine of country’s economic development and external environment of higher education is changing very fast, simultaneously everyone expects that higher education will continue to escalate the human life. On the contrary, higher education institutions are scrambling to survive in the competitive environment and conflicting internally in fulfilling their mission and the vision of their university (Baker & Wiseman, 2008).

The technical and academic knowledge is obtained mainly through universities or HEIs. Theoretically, higher education institution is a place where innovative knowledge is created for the country development. It is a place where individual foster their knowledge and leapfrogging in their life time development and also HEI educate individual the importance of the Internationalization and globalization of the education (Maringe & Foskett, 2010). Higher education institutions are supported or funded by government as well as private or non-government organizations.

Globally universities are most successful institutions or organizations in the world and they are most long-lived organizations if compared with any other organizations. For instance in western countries, University of Paris, University of Bologna and Oxford University are all more than 800 years old (Hermans & Nelissen, 2005; Baker and Wiseman, 2008). In eastern countries the oldest universities are Peking University & University of Hong Kong in China; Yonsei University in South Korea; University of Madras, Mumbai and Calcutta in India; University of Tokyo in Japan; University of San Carlos in Philippines; and University of Sydney in Australia.

In 1995, more than 47 million students enrolled in higher education in the developing world, up from nearly 28 million in 1980. This is growing fast as compared with growth of population in some of the developed countries. Asia has the largest population in the world; regionally china and India are the mover and shakers of the Asian region. However, Southeast Asian countries do play their role. As per WHO or UNESCO 17 million-graduated came out from the university every year and out of this, 50% are unemployed. According to Chapman (2006), the college or universities campus "is a place that is distinguished by the quest of those who journey there searching for knowledge, seeking intellectual, cultural, and social enlightenments, aspiring to a change in the tenor of their lives". Nevertheless, higher educations have the long lasting impact on the country's overall growth and development, which trickling down the grass root level as well as their impact spill-over to many areas such as knowledge society.

As of 2013, more than 100 million students enrolled in higher education institutions worldwide (Kandiko & Weyers, 2013). In North America total students enrolled in the year 2013 in colleges and universalities were more than 22 million (National Center for Education Statistics, Digest of Education Statistics, 2013; Statistic Canada, 2013). Enrolment of the students encourages the policy maker to plan ahead approximately 300 billion US dollars per year and this will further increase by 10 percent per year as number of enrolment is increasing per years. The American public universities are the pioneer in producing knowledge workers in the 21st century. Out of total Nobel laureates, 75 percent of them are from American public universities.

3.2 The Influencing Factors for the Knowledge Society Through Higher Education

Universities play the major role in producing the amiable personalities with strong skill and prominent knowledge workers for the nation building (Funnekotter, 2005; Santos, 2006; Keller, 2008; Singh, 2008;). These are built through a strong focus on the importance of human capital, governance, culture, research, innovation, infrastructure and ICT (Geiger, 2004; Weert, 2005b; Sharma et al., 2008a; Sharma et al., 2008b). Literatures and previous studies related to each of these factors are studied in details below.

3.2.1 Human Capital (HC)

Human capital (HC) is one of the important factors in the development of knowledge societies and is the heart of the development in any countries. HEIs play vital role in producing stock of HC for the country development and move toward KBS. HC research has been studied in different sectors not limited to the educational sector. Investment in HC has the potential to grow as well as spillovers the resources to another different area of economics and the valued addition to the product (Kurtz, & Brooks, 2011; Boccanfuso et al., 2012). Becker established the human capital theory in 1964 in his book: human capital, where he formalized educational choices as rational choice of optimizing agents, who compare the present value of earnings to be expected from education and its related costs, over a life-cycle period (Becker, 1993).

According to Sen (1993), the stocks of HC signify the outline of being and doing – the capability to “be” and “do.” thus HC comprises an individual's capability and functions (Zaman et al., 2012). Hu (2011), argued that HC investment need to explain and defined a broader scope not only from the five traditional (Schultz, 1961) aspect of HC investment: 1) health facilities and services; 2) on-job training; 3) formal education; 4) training program and 5) migration), but also the materialized ability and spiritual aspect of the people.

The importance of HC generally add of education in particular in growth theory was emphasis only in the 1980s and 1990s among endogenous growth models in the expanded neoclassical growth model of Mankiw Romer and Weril (MRW). The

expanded neoclassical growth model sees human capital as an add input, hence countries that have faster growth rate of education will have faster transition growth rates and higher income level as well moving towards the KBS faster. The conventional approach to valuing the economic activity generated by colleges and universities often focus on the direct employment or expenditure effect, along with multiplier effects to capture indirect and induced outcome.

HC presents the individual with tacit knowledge embedded in mind and is important source of innovation. The stocks of education in HC have been increasing due to heavy investments in education by the parents and the government as well as by international organizations through scholarships and stipend support (Booth, 1999; Kirchsteiger & Sebald, 2009; Sebald, 2009; Chan & Ngok, 2011; Gertler et al., 2011; Levine and Levine 2011). According to Lee & Franciso (2010) parent income and education; income distribution; number of children in the family; government policy and culture and ethic are the main impact of the growth of HC through education. Besides, the region with high levels of capital tend to have higher wages, more innovation and faster population and employment growth and greater prospect for reinvention as the economy change over (Michael & Kretovics, 2005; Abel & Deitz, 2011).

Nevertheless, the accumulation of HC through higher education is the major sources of the sustainable development of the country and it lead nation towards KBS (Douangngeune et al., 2005; Brempong et al., 2006; Hanushek & Woessmann, 2008). HEIs plays major role in building stock of HC and through them knowledge, training, professional development and skills are horned and developed and provide additional value to a nation (Bontis, 2004; Goldstein & Renault, 2004; UNDP, 2009; Mitra et al., 2011). In addition, an amount of HC in the country is a key determinant of the national economic growth and prosperity (Abel & Deitz, 2011). Furthermore, the modification of HEIs leads to the production of large amounts of HC in the knowledge society. At the same time, it demonstrated as very important player in escalating the access to higher education and clotting the role of universities. HEI role is to develop the “civic and cultural values, in promoting self-enlightenment, opportunity and equity” (Doughlass, 2010).

Nevertheless, the empirical evidence suggested, “parents with higher levels of education generally attach a higher importance to the education of their children” (Kirchsteiger & Sebald, 2009). In most of the developing countries, though large investment in education is in place but still education and HC remained low. This could be mainly due to inefficiency in the educational system or immigration of educated people. In other previous studies by various authors, HC defined and determined based on the literacy rate, school enrollments, expenditure on education and training, years of schooling and level of education of the labour force.

The HC is build-up on the labour, knowledge and skill apply to the fruitful activities, recognizing the value added to the economy (Schultz, 1961). HC has been defined as the storing of efficiently productive human capabilities. OECD (1998) defined HC is “the knowledge, skills and competences and other attributes embodied in individuals that are relevant to economic activity”. Lado and Wilson (1994) refers human capital as a knowledge, skills and capability and capacity of human beings (competency). Underlying this concept is the notion that these skills and knowledge increases human productivity and that they do so enough to justify the cost incurred in acquiring them. Another factor in defining HC includes Know-how, capabilities, expertise, personality, competencies, skills, qualifications, ability to learn and network contacts (Dzinknowski, 2000; Mayo, 2005; Stark et al., 2011).

In regards to the measurement of human capital, Bong-Dae (2009) categorises the measurement of human capital, in different approach namely output-base approach or cost-based approach or income based approach or new measurement approach. In addition, the research on HC theoretical and empirical is often very technical and therefore not easily accessible to those who want to use the insight in applied research. With the HC, it generates various research that contributes further in enhancing the country’s competency and competitive advantage (Ogunade, 2011) and for that universities are the traditional sources of HC. In the context of HEI, HC is referred to the level of qualification achieved by the individual through universities, where they enhanced their knowledge, skills and advanced their knowledge and also competency as well as horn their academic quality (Mohan & Mohan 2002; Meara, 2011; Stark et al., 2011; Blanden et al., 2012; Hrabinová et al., 2012). In this

research, researcher refers human capital as knowledge, skill and competency gain by the individual from HEIs.

1) Knowledge

The contribution of knowledge itself towards the local and centralgovernment development as well as globally has been immense. The knowledge workers gain and learn their creativity from HEIs and make it possible to use their knowledge practical and functional and also to make innovation continuously. This is a key factor in developing and moving towards the KBS (Wang & Thorns, 2009; Ramezan, 2011).

Policy makers, researchers, scholars and corporate decision makers do have the same confidence and the perception that 21st century is the knowledge society where knowledge plays most significant roles in contributing towards all perspective of development such as economic, political, and social (Drucker, 1993; Chen, 2012). Knowledge is the resource that forms the foundation individual or organization or nation's capacities and capabilities. According to Stiglitz (1999) knowledge as a global public good is more valuable when shared without any boundaries. Matsuura (2007) stated that "an economy based on sharing and diffusion of knowledge provides an opportunity for emerging nations to increase the well-being of their population".

Knowledge is the main product of the HEI (Cohen & Kisker, 2010) and the three main types of knowledge used and produced such as "Know How" and other two are ideological and cultural knowledge. It is important to know what exactly is meant by knowledge. The dictionary meaning of knowledge refers to 'the fact or condition of knowing something with familiarity gained through experience or association' (Merriam-Webster Online Dictionary, 2009).

According to Davenport & Prusak (1998), knowledge is "a fluid of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information". The knowledge of organizations comes from the theories of organizational learning and knowledge management and these two are more important to any organizations (Miner & Mezias, 1996; Hansen et al., 1999).

Psychologically According to the literature, taxonomy of knowledge has been expressed:

(1) Knowledge may be used or left unused, Knowledge depends on social conditions and is related to social power (Social Capital), and Knowledge is information that changes something or someone (Drucker 1993, p. 251).

(2) Stehr (1994: 95) defined knowledge "as a capacity for social action".

(3) Nonaka (1991), observe that, in the current economy, where "the only certainty is uncertainty, the one sure source of lasting competitive advantage is knowledge".

(4) Knowledge is the art of creating value from intangible assets (Sveiby, 1997).

(5) Knowledge cannot be easily stored. Knowledge is something that resides in people's mind rather than in computers. Knowledge should be studied in context. Knowledge is information combined with experience, context, interpretation, reflection, and perspective (Mårtensen, 2000).

(6) Information has little value and will not become knowledge until it is processed by the human mind (Mårtensen, 2000). This transformation process is affected by individual's experiences, attitudes, and the context in which they work (Mårtensen, 2000).

(7) In contrast to tangible goods, which depreciates when not used, knowledge grows when used and depreciate when not used. Out-of-date knowledge is being considered a liability rather than an asset (Sveiby, 1997; Mårtensen, 2000).

Firestone and McElroy (2003) distinguished different types of knowledge. The categorization of the different types of knowledge is based on the following distinctions. The detail and explanation of these different types of knowledge is given in the Appendix A.

(1) World 1 Knowledge (material), World 2 Knowledge (Mental), and World 3 Knowledge (artefact-based);

(2) Situational knowledge and knowledge predispositions;

(3) Tacit, implicit and explicit knowledge;

(4) Implicit knowledge and logically implicit knowledge.

Based on the above taxonomies on knowledge, the most vital and typical is the relationship between tacit, implicit and explicit knowledge. At the HIEs, it is not only platform where knowledge gains through explicit way but also gains the

implicit and tacit knowledge over a period of time. These knowledge gains from the HIE, knowledge workers apply and implement in their real and practical life. In addition, HEIs are the knowledge intensive organizations where they have to share, obtain, store, utilize and generate knowledge in the daily educational activities (Ozmen, 2010).

In many cases, well-known entrepreneur builds their own firm at HIE through their explicit as well tacit knowledge gained from the universities. For instance Microsoft, Dell Company, Facebook and Google are some of the organizational outcome from HEIs and there are many more similar cases.

By and large, every individual has the tacit knowledge in various areas, either it is intellectual level or at grass root level. The tacit knowledge normally gains through the experiences and also by learning by doing. Tacit knowledge is non-verbalized, intuitive, and unarticulated (Polanyi, 1967) and is often regarded as a fundamental basis for competitive advantage from a resource-based view of the firm (Barney, 1991). On the other hand, explicit knowledge is verbalized, written, drawn (Polanyi, 1967) and can structured, coded and articulated which makes easier to share, understand and integrate (Barney, 1991; Grant, 1999; Simonin, 1999; Becerra et al., 2008; Bolisani, 2008;). In regards to the implicit knowledge, very less study has been carried out. Implicit knowledge can likely be codified but has not yet been codified. Implicit knowledge is more concerned "with the 'knowing how' to do something at the same time able to express things to be carried out. This led to codifying the knowledge in an explicit manner. However, tacit knowledge would be difficult to codify as it need more time to understand and digest the gist of the knowledge. Stehr (1994) identified three key features of tacit knowledge and these are:

(1) Tacit knowledge acquired with little or no environmental support

(2) Tacit knowledge is viewed as procedural in nature

(3) Tacit knowledge is of direct relevance to the individual's goal

Gaining the tacit knowledge in the organization (HEIs) is through sharing the knowledge. The sharing of tacit knowledge could be through the "apprenticeship, direct interaction, networking and action learning that include face to face social interaction and practical experiences" (Haldin-Herrgard, 2000). According

to Nonaka and Takeuchi (1995; 1998) tacit knowledge needs to transfer in explicit manner and explained that "tacit knowledge is personal, context-specific, and therefore hard to formalize and communicate. Explicit or 'codified''. They explained the four ways of knowledge conversion between tacit and explicit knowledge and these are Socialization, Externalization, Combination and Internalization: SECI-Model.

The socialization (tacit to tacit) includes the social interaction where learning and sharing of new knowledge is between individuals. Externalization (tacit to explicit) requires expressing the tacit knowledge and makes it explicit and understands clearly. Combination (explicit to explicit) involves the transferring of explicit knowledge by communication in meetings, discussions, workshop and seminars. Internalization (Explicit to tacit) is where newly created knowledge is converted from explicit to tacit. In addition, they stated that "Knowledge that can be expressed in worlds and numbers represent only the tip of the iceberg of the entire body of knowledge".

According to Hedesstrom and Whitley (2000), tacit and explicit knowledge compliment each other but both the knowledge is two ends of continuum yet tacit understanding is always involved in explicit statements. Tacit knowledge should be explicitly expressed through different mechanism either by sharing and exchanging the knowledge or by using the metaphors and some kind of models (Ambrosini & Bowman, 2001; Elenurm, 2008; Smith, 2011). The last two mechanisms will be helpful and also important in creating the concept of the tacit knowledge. However, not all the tacit knowledge can be made explicit and also HEIs are not capable in utilizing it.

However, Riege (2004) study results shows that there are barrier in sharing the knowledge in the organization mainly because of three major factors such as individual factor (e.g. lack of trust, lack of communication skills and differences in the culture), organization culture (e.g. unclear strategic and managerial direction, to-down approach, lack of appropriate infrastructure, misallocation of the human capital, lack of formal and informal mechanism of knowledge sharing) and the factor or technological factors (lack of integration of the IT system, lack of technical support, lack of training and lack of understanding of the technology).

2) Skills

Individual gain their skills through tacit knowledge as well as from the implicit and explicit knowledge. However, those skills can be horned by participating in training, workshop and other academic activities. Training could be either at the very grass root level or at the highest academic degree level. A skill is beneficial for the individual, where they can use it for their livelihood or career development. In addition, nations are moving forward towards knowledge based society and for that it requires various kinds of skills such as analytical and planning skills, logical and critical thinking, creativity, team skills and communication skills. Also, market needs individual posses generic skills involving the ability to formulate new strategies, teamwork, relationship building and problem solving (Yu and Velde, 2009). The generic skill could be the study skill, information skills, information, technology (IT), mathematic, and communication (Tait and Godfrey, 1999).

On the other hand, the individual develops and horns their academic skills through high school, vocational colleges and universities. The skills they gain through their school life is writing, listening, speaking and understanding skills. When they reached towards the tertiary sector, they gain more of analytical skills.

Technical skills refer to individual abilities to accomplish task related to mathematical, engineering scientific or computer related and other specific given task. Most of the technical skills are required for the specific jobs and task especially the proficiency in the performance of those given task (Daft, 2008; DuBrin, 2009). In addition, technical skills are also referred to the professional oriented skills where only trained and professional can do or complete the given task. Technical skills are also frequently referred to as hard skills too. For example building bridges, infrastructure and construction are done by the civil engineering experts. Universities focus more on providing advance level of technical skills. Basic levels of technical skills are trained from the local government training centre. But for the advance level of technical skill is mainly through the HEIs, where lots of experiments are carried out to get the right solution at the same time gaining of the technical skills (Velde, 2009). The following table 3.2 summarized three different types of skills.

Table 3.2 Type of Skills

Academic Skill	Generic skill	Technical Skill
✓ Communication skills ✓ Writing skills ✓ Interpersonal skill ✓ Assessment skills ✓ Critical analysis/ ✓ Problem solving ✓ Reflective/self monitoring skills	✓ Basic skills ✓ Teamwork skills ✓ Thinking skills ✓ Enterprise skills ✓ Leadership skills ✓ Lifelong learning skills	✓ Information Management skills ✓ Technological skills ✓ Analysis ✓ Specialists ✓ Technicians ✓ Profession
(Ballantine & McCourt, 2004; Culin & Scott, 2011)	(Hamzah and Abdullah, 2009; Rahman et al., 2011)	(Daft, 2008: DuBrin, 2009; Culin & Scott, 2011)

Thus the HEIs need to take the responsibility in producing knowledge workers with above three skills for the knowledge society.

3) Competency

The term competency and competencies are often used interchangeably in different literatures. However, some scholars or experts distinct these two terms separately. Competence refers to the skill or standard of performance (Rowe, 1995; Hoffmann, 1999; Boyaktzis, 2002; Brophy & Kiely, 2002) whereas competency is more of behavior which achieved those performances (Whiddett and Hollyforde, 1999).

Martinez (2008) stated that competencies may be meaningful view through four groups from the total of 25 competencies (Appendix E). These four categories are 1) External-technical; 2) Internal-technical; 3) Internal and interpersonal and 4) External – technical, interpersonal. Prien et al. (2003) classified competencies in two broad categories namely Can-do competencies and will –do competencies as shown below:

Can-do competencies	Will – do competencies
✓ Individual capabilities that tap into the basic ability to perform a work activity: can-do competencies include: o Skills: individual capability that have developed as a result of education, training, or experiences that underlie an individual's capacity to perform a work activity o Knowledge: individual understanding of ideas and concepts that have emerged as a result of education, training or experience and that serve as a platform for performing a work activity	✓ Personality and attitudinal characteristics that tap into an individual's willingness to perform a work activity; will –do competencies may be written as "willingness to" as in "willingness to persist in the face of obstacles or difficulties", for example.

The competency is focused on the person (Whiddett and Hollyforde, 1999) or individual and depends on capacity and capability to absorb and deliver the knowledge. The attitude of the individual is important as it influence over others since he or she need to work together with other individual in the society, organization or in the universities.

However, different individual has different capacities and capability and the attitude to carry out their work either it is in learning, working, teaching, or leading their group or team. Without the individual capacity and capability, universities would not be in a position to excel the performance in producing knowledge workers. It is the individual capacity and capability, which play important role in building the university towards knowledge society.

According to Fraser and Greenhalgh (2001) capability is "extent to which an individual can adapt to change, generate new knowledge and continuously improve performance". Connor and Pokara, (2007) argue that capability could include

the individual's willingness to monitor their own performance, development and to self-reflective.

Capacity is related to the power to experience, learn, produce or retain something and refers to innate potential. The greater an individual capacity, the greater his or her potential to learn, grow and understand (Beerel, 2009) and also add value to the society (Fabbris et al., 2011).

3.2.2 Governance

Society, government and the public are expecting university governing board to respond to the impact of the globalization and modernization. Universities being production house of the knowledge and at the same time massification of higher education institutions in different part of the world, there is new governance structure to manage the university's dynamic task and roles of today's external impact on them. In addition, the universities are expanding it direction towards more of a market-oriented (Menon, 2003; Geuna and Muscio, 2009).

Good governance plays significant role in achieving social and economic development of the country. It is also strong state machinery for the prerequisite of sustainable development. Generally, governance is defined as the exercise of economic, political and administrative authority to manage a country affair at all levels, which incorporate aspects of these three given factors.

Some of the key factors of good governance generally included are organization capability; reliability; predictability and rule of law; accountability; transparency and participation. These factors are seen as ensuring national prosperity (Shiroyama, 2001; Joanne and Christian, 2003; Farazmand & Pinkowski, 2006). In this research, focuse is on the last two factors: accountability and transparency in regards to higher education.

The university governance needs to be more organic in structure in this 21st century. Governance in higher education refers to the means by which HEIs are formally organized and managed, though often there is a distinction between the definitions of management and governance. Simply, university governance is the way in which universities are operated.

The governing structures of higher education are highly differentiated throughout the world. However, in various studies, the governance of universities is usually unclear and frequently contested (Boyer, 1987; Keller, 2008). The concept of governance for tertiary education mostly refers to the internal structure of organization and management of autonomous institutions. The internal structure of the governance is mainly composed of governing board, the president, academic senate and deans. Following table 3.3 shows some of the definitions of the university governance provided by different scholars.

The government policy towards university governance needs to allow institutions to make the most of their autonomy and new responsibilities. Universities are on the "policy agenda in every country and government search for means enabling a less expensive and more efficient management of the sector" (Ferlie et al., 2009). Shattock, (2006) explained in details about the origins and development of modern university governance and also a different governing model of the university.

Table 3.3 Definition of University Governance

Authors	**Definition of University Governance**
Taylor, 2010	To control activities carried out in universities.
European Union, 2012	Action by executive bodies, assemblies and judicial bodies in both corporate and state contexts
Toma, 2007	Both as simple and as complicated, responding to the question: who makes what decisions
Shattock, 2006	The constitutional forms and processes through which universities govern their affairs.
Neave, 2006	A conceptual shorthand for the way higher education systems and institutions are organized and managed

However, from last few decades there have been significant changes in the structure and governance of higher education in different part of the worlds, where government's policy was explicitly stated university needed autonomy and be quality oriented rather than led by the government (Baird, 1997; Amaral et al., 2002; Mook,

2002; Sporn, 2003; Tighe, 2003; Bleiklie & Kogan, 2007; Fielden, 2008; Altbach et al., 2011; Bastedo, 2012;). This allows the university system to respond fast and flexible to the market demands.

According to Fielden (2008), he framed the university governance in four different models: from control to autonomy. Table 3.4 shows these four models. According to him, among the different part of the world, Australia, Denmark and United Kingdom led their university in the country with guidance on good governance.

Table 3.4 Four Model of University Governance

#	Institutional Governance Model	Status of public universities	Example
1.	State Control	Can be an agency of the Ministry of Education (MoE), or a state-owned corporation	Malaysia
2.	Semi-Autonomous	Can be an agency of the MoE, or a state-owned corporation or a statutory body	New Zealand, France
3.	Semi-Independent	A statutory body, a charity or nonprofit corporation subject to MoE control	Singapore
4.	Independent	A statutory body, charity or non-profit corporation with no government participation and control linked to national strategies and related only to public funding	Austria, United Kingdom

Sources: Fielden, 2008.

Furthermore, Kovač et al. (2003) argued that the "internal structure of university governance needs to be changed according to new roles and responsibilities, calling for a clear vision and new approaches to developing policies". According to Tighe, (2003), the "upper level of university governance has changed dramatically over the past several years while the lower level, that is, faculty shared-governance mechanism, has remained same in structure and process". In addition, Heaney (2010) suggested the share governance, where "honors varied responsibilities and acknowledges the complex interweaving roles of faculty, administration, staff and student in fulfilling the mission of university".

In the 21st century, the traditional tools of governance of the university still remain such as governing by rules but there are many new instruments of governance also flourished (Bleiklie & Kogan, 2007). De Boer and Geodegebuure (2001) classified the university governance structure in four dimensions and these are shown below in table 3.5.

According to Heaney (2010), share governance was meant to change all that bringing faculty administration and other stakeholders to the same planning table, but the addition of faculty to an already established governance structure relatively late in the history of the university, and almost as an afterthought, was problematic from the start". Kovač et al. (2003) suggested attention should be given to creating a mechanism of integration and coordination among faculties. Menon, (2003) argues that the university needs to increase the student participation in their highest level of governance, "especially in the decision making concerning with the aims and mission" of the university.

Table 3.5 Classification University Governance Structure

Dimension	Type	Explanation	
1.	Democracy Or Guardianship	Academic democracy synonymous with representative democracy Office holders are appointed on the basis of their competence: mixed of professional and managerial expertise.	In this dimension, the powers may or more or less be concentrated
2.	Distribution of Power	Horizontal dimension: powers are divided between two more or bodies at the same organizational level; Vertical demission: powers are distributed over different organizational layers	
3.	Moncephalic Or Bicephalic	Head of the university is the head of both the academic and administrative hierarchies. The role of administrative hierarchy is more prominent.	
4.	Decentralization	Devolution of powers allowed for greater flexibility, increase capacity to acknowledge and lead with the local needs and situation, and relieved the administrative burden at the central level.	

Source: De Boer and Geodegebuure, 2001.

Nevertheless, Hood et al. (2004) study focused on the use of four types of government regulation of research and higher education. These four types are 1) oversight; 2) mutuality; 3) competition and 4) contrive randomness. This is developed to analyses the "formal and informal forms of government control comparatively

across nations, across different public sectors and their development over time". More details of each type are presented in table 3.6 below.

Table 3.6 Four Types of Government Regulation on Research and Higher Education

#	Type	Meaning
1.	Oversight	Correspondent to the classic form of government control through laws, regulations and other forms of control from above
2.	Mutuality	Control by formal or informal group processes and may have many shapes and forms, but in academic life the typical form is the collegiate body that they find in traditional university governing bodies dominated by professors, hiring committees, peer review bodies, and research funding councils.
3.	Competition	May be any form of institutionalized rivalry, such as in competition for research funds or academic positions.
4.	Contrived Randomness	Understood as anyway in which control of individuals may be exercised to make their lives unpredictable, for example, by random inspections or audits, selection of the office holder by loto rather random selection processes

Source: Hood et al., 2004.

However, the key two critical factors of the governance are the accountability and transparency (Piotrowski, 2007) in governing any organization either it is corporate organization or public organization or universities.

1) Accountability

Accountability term is frequently used in management, policy and decision making for substances of normal reporting in explaining the inputs, output and outcomes as well as to justify the values created through executing the accountability in the institutional system. The interest of accountability in the academic world is to generate and produce quality education for nation building, meeting the "public needs in student access and attainment" (Burke, 2005), employability in the market and serves the society.

Public interest has grown up in tertiary education tremendously since last three decades. According to OECD the perception of the traditional measurement such as peer review and market choice are not sufficient indicators of institutional value (Alexander, 2000). Therefore, in late 1990 and early 2000, the trend of accountability in higher education torrent many of the OECD countries and is because of need better measurement of the institutional performances especially for the HEI. At the same time, the trends have been growing that universities need to be more transparent and accountable in producing their product: knowledge (Baird, 1997; Coy et al., 2001; Vidovich & Slee, 2001; Dunn, 2003; Huisman & Currie, 2004; Leveille, 2006; Liu, 2011). Globally there is "trend toward greater accountability and control of higher education" (Michael, 2005). Thus, HEIs need to demonstrate the "value for money for responsible and relevant activities undertaken with the taxpayer's money" (Santiago et al., 2008).

The main objective of the authorities of HEIs is to ensure that public resources are efficiently spent by the HEIs to societal purpose at the same time provide quality education and govern and manage its institutes precisely. The meaning of accountability has been defined in various fields of studies depending on their objective of the study. Table 3.7 shows some of the definitions of accountability by different scholars**.**

The concept of accountability in the universities, it has discussed in the late eighteen century. Smith (1976, p. 620-665) advocated the need for competition and accountability in universities. Kenneth (1972) stated, "The multiplicity of uses of the term accountability has resulted in a situation in which it is difficult to ascertain what reforms are necessary to achieve it and what activities should be revised". To deal the content of the literature dealing with accountability in higher education, he classified the accountability in three different areas namely managerial accountability; accountability versus evaluation; and accountability versus responsibility.

Table 3.7 Definition of Accountability

Authors	Meaning of Accountability
Merriam- Webster On line Dictionary's	An obligation or willingness to accept responsibility or to account for one's action
Burke, 2005	Accountability imposes six demands these are: 1. They must demonstrate that they have used their powers properly 2. They must show that they are working to achieve the mission or 3. Priorities set for their office or organization. 4. They must report on their performance, for "power is opaque, accountability is public 5. The two "E" words of public stewardship—efficiency and effectiveness—require accounting for the resources they use and the outcomes they create 6. Fifth, they must ensure the quality of the programs and services produced. They must show that they serve public needs.
Ingram, 2004	Willingness to address issues the public should care about – to serve the public trust
Romzek, 2000	Accountability, which is understood as answerability for performance, raises immediate questions for the one held to account. Accountable for whom? For what? And how?

Alternatively, Romzek (2000) identifies four types of accountability relationships and these are hierarchical, legal, professional and political. The last two types are mostly found in higher education. According to Corbett (1922 in Vidovich and Slee, 2001), the concept of accountability is categorized into four types namely upward, downward, inward and outward accountability.

(1) Upward accountability represents the traditional relationship of subordinate to a superior. It covers procedural, bureaucratic, legal or vertical accountability;

(2) Downward accountability focuses on a manger being responsible to subordinates in participatory decision making or collegial accountability in higher education;

(3) Inward accountability centers on agents acting on professional or ethical standards and often appears in organizations dominated by professionals, such as in colleges and universities where it become professional accountability'

(4) Outward accountability means responding to external clients, stakeholders, supporters, and in a democratic society, ultimately, to the public at large. It includes market and political accountability.

Burke (2004) stated that accountability imposes six primary obligations on college and university leaders and they must do the following: 1) Demonstrate that they are using their power properly and legally; 2) Show that they are working to achieve their designated mission; 3) Report how well they are performing to stakeholders and public; 4) Pursue effectiveness and efficiency by comparing the results achieved with the resources received; 5) Ensure program quality; and 5) Guarantee the institution in responsive to the public's need.

Burke (2005), in his accountability mode (Appendix B), he stated that higher education has featured at least "six models of accountability and these are bureaucratic, professional, political, managerial, market and managed market". On the other hand, Bovens (2010) has distinguished accountability in two concepts: accountability as virtue and accountability as a mechanism. He argued that both the concepts should be clearly distinguished as they "address different kinds of issues and imply different standards and analytical dimensions". The former is used primarily as a normative concept where focus is on the actual performance of official and agents. The latter one is used in a narrower and descriptive sense, where studies are on the political and social control (Appendix B).

Universities do acknowledge that they need to demonstrate their accountability to the public and private sector for the support that they are getting from. On the other hand, HEIs are expected to develop their own system of quality

control and assurance that would demonstrate accountability for the use of public and private funds (Goedegebuure et al., 1990; Harvey & Askling, 2002; Sporn, 2003). The knowledge workers perceived HEIs to guaranteeing the academic quality and standards and ensuring the equity and access to the higher education (Santiago et al., 2008). In addition, universities must reflect the accountability at every level in their system (Robinson et al., 2011; Amir et al., 2012) such as governance, academic quality, and transparency.

2) Transparency

Transparency became the central issues of any business, either it is in government or corporate organization or in development agencies or in international relations (Bennis et al., 2008; Vaccaro & Sison, 2011; Backer, 2012; Hardi & Buti, 2012; Meijer, 2012). According to Bennis et al. (2008) transparency is concerned with the "free flow of information within the organization and its many stakeholders".

In the 21st century, HEIs need to be transparent in terms of facilities, employees and its curriculum. It is very important for the universities to be transparent so that prospective knowledge workers can decide in selecting the universities and making the final decision to be enrolled in their choice universities. This is a life time decision making when one pursues higher education degree career in the competitive world. For instance, in Australia, the government has created one platform where all the information about public universities is available (Austrialian Government, 2012). From this platform, students and parent can get more details of each university such as the fees, facilities, quality as well as academic offerings.

In addition, universities received different funding from different organization either it is public sector or private sector. Public universities get their funding mostly from the State and private sector.

Pagano and Pagano (2003), refers transparency availability of information with the assumption that it is made available to the stakeholders: internal or external to the organization.

3.2.3 Academic Quality

The university cannot comprise the academic quality in producing the knowledge worker to the society. Dill (2006) viewed "academic quality is defined by academic standards i.e. the level of educational achievement attained by higher education graduates". In addition, academic quality also matters to attract prospective students and secure revenue for the universities and also able to compete in the competitive environment.

However, there is debate on defining the meaning of academic quality globally and there is no clear cut definition for academic quality but some of the institutes depending on the ranking of their universities which terms higher ranking have the high level of academic quality. UK (DFES, 2003) argued that market competition could be an important driver for academic quality, if appropriate university information can be provided to help inform student choice.

Dill and Soo (2004 and 2005) reviewed the leading commercial university leagues tables from Australia (The Good University Guide), Canada (the Maclean's Guide to Canadian Universities), the United Kingdom (The times Good University Guide), and the United States (US News & World Report, America's Best College). They suggested that the definitions of academic quality used in the above are converging globally. They also reviewed the effectiveness of these league tables applying a framework developed in a study of organizational report cards in various sectors. They stated the five league tables varied in their validity, comprehensiveness, comprehensibility, relevance, and functionality. They said an apparently important contributor to the most effective university rankings is government policy.

Nevertheless, the measurement of academic quality is very critical. In some studies, the measurement of academic quality is based on the number of citations an article receives. This measurement is highly consistent if compare with other measures of quality (Baired & Oppenheim, 1994; Johnson & Podsakoff, 1994; Baldridge et al., 2004). The academic quality is therefore most important tools in the knowledge market and is "equally important from the perspective of employment and social cohesion" (Santiago et al., 2008).

3.2.4 Culture

HEIs train and groom scholars, policy makers, leaders and experts for the betterment of the society. The knowledge and experiences gained by them from universities or college would impact lifelong in their life. Cultural experiences gained from the HIEs would make them understanding of the different environment and respect to learn differences of the culture existences.

In addition, universities create an environment where knowledge workers can develop the ethical commands parity of esteem with mental development (Reeves, 1988; Arthur, 2005). Universities build a culture of knowledge where knowledge workers can learn and gain the knowledge at the same time it "builds a strong connection with the surrounding community and non-academic world" (Chapman, 2006). Thus, campus provides a rich learning experience to their students and scholarly atmosphere where they contribute and implement the ideas for the country development and brings it to another level.

According to Sanford (1970) "in order to become a person, an individual needs to grow up in a culture, and richer culture the more of a person he has a chance of becoming. The central purpose of the institutions of higher education is to educate (Adults as well as young people); and the aim of education is to develop each individual as full as possible, to make man more human".

The study of culture in the organization has been emerged since last three or four decades, especially its impact on the organizational effectiveness. Peterson and Spencer (1991), defined in their study that the organizational culture is a "holistic perspective and it focuses deeply embedded patterns of organizational behavior and the shared values, assumptions, beliefs or ideologies that member have about their organization on it works". A study on the university campus culture has made since 1960s primarily concern with the student cultures (Tierney, 1998).

Definition of the culture varies depending on study focus as the nature of the business. In HIEs, local government and the university leaders do emphasize on their university culture in order to develop the appropriate level of competence of function effectively in a rapidly emerging global environment. According to Kuh and Whitt (1998), the university and colleges culture is defined as "persistent patterns of norms, values, practices, beliefs and assumptions that shape the behavior of individuals and

groups in a college ans university provides a frame of references within which to interpret the meaning of events and actions on and off the campus".

At HEIs, culture is mainly referring to the values and beliefs of institutes communities based on tradition and communicated verbally and nonverbally and the effect of these values and belief on decision making at universities is strong (Fralinger and Olson, 2007)**.**

3.2.5 Research

Normally, public and politician perceived that the goal of the university should be on research to resolve the issues of the industry, medical, economic and societies. HEIs researches are accommodated in resolving the business, social and scientific issues. At the same time, they do their best to comply with the ever-changing requirements imposed by the society. Moreover, every research work generated by HEIs has the potential for facilitating and contributing to the knowledge society and for the countries overall growth and development. HEIs research contribution is immense in bringing the nation towards KBS.

According to Grinnell (1993) research is "structured inquiry that utilized acceptable methodology to solve the research problem and create new knowledge area from the research based on finding of research studies". HEIs build the knowledge society through research and from their related activities. These research activities are built up of knowledge through 'incremental research, testing, measurement, better instrumentation or new uses of research technologies' (Santiago et al., 2008).

Research and development through higher education has positively related to the economic and knowledge development of the countries. Various types of research carried out in universities, either it is applied research or advance research, contributions are immense in leapfrog the country overall growth and development. For instance, advancement of Nordic countries towards knowledge society is mainly through their focus on the research and development.

> "Research is the process of undertaking or carrying out original investigations in all its form: analysis, innovation, experiment, observation, intellectual inquiry, survey, scholarship, creativity, measurement,

> development, hypothesis or novel comprehension". In addition, Research is defined as "to careful and systematic study in some field of knowledge, undertaken to establish facts or principle" (Grinnell, 1997).

In KBS, there must be broad and extensive research and development in aiming the acquiring of knowledge through learning from common public good and competitive private advantage (Ergazakis et al., 2006; Sharma et al., 2008a; Sharma et al., 2008b). Research activities are generally an integral part of the knowledge production process and it generates new knowledge areas (Shapira et al., 2006). Every research has the potential for facilitating and contributing to the knowledge society and for the countries overall growth and development (Zaman et al., 2011). Categorically, there are three main types of research namely action, applied and basic research.

Action research is a combination of action and research to identify or examine specific phenomena or questions through observations and reflection, and deliberate intervention to improve practice. Applied research is concerned with the systematic inquiry related to the practical application of science, where it deals with solving the practical problems and normally utilizes empirical methodologies. Basic research is experimental and theoretical study undertakes to acquire or achieve new knowledge without looking for a long term advantage other than the advancement of knowledge. Research through universities, creates the opportunity not only for individuals but also for country, region, industry (Vest, 2007). Bushaway, (2003), define research in universities as:

(1) Routine testing and analysis of materials, components and processes (as distinct from the development of new analytical technique themselves)

(2) Development of teaching and learning materials where existing knowledge is simply synthesized.

Furthermore, the previous studies have shown that investment in the research and development creates new products and new intellectual property. This helps in a competitive advantage over other countries or organizations. Intellectual capitals are born through research and development and it is understood that almost everyone in

knowledge society has the potential to create intellectual capital either at the very grass root level or at an academic level (International Chamber of Commerce, 2005). Intellectual capital is defined as intangible assets produce by the companies, organizations, or universities by its employees or researchers effort and knowledge assets such as patents, trademarks, and copyrights (Bernard, 2007). For instance, in the United States, the universities follow the Bayh-dole Act 1980, which gave them the responsibilities to manage their intellectual property generated by their faculty and staff members (Lebret et al., 2006).

The primary importance of any country is to develop the capacity and capability of the science and technology through research and the driving force to move the country forward is the nation's capacity for innovation and enterprise (Bushaway, 2003).

3.2.6 Innovation

In the 21st century, innovation is now no longer a choice but it is must for everyone, whether it is small business organizations, corporate organizations, non-governmental organizations or educational sectors. Innovation is another factor, which induces the country toward KBS. Innovation engages for the future an opportunity for the next generation and the country development as well as move towards KBS. Innovation also invigorates the opportunity, which unlocks the angles to new intelligence and invention. Without innovation, one may face the consequence in keeping out from the current modernization society. In addition, forces of globalization and modernization compel the corporate and development agencies to be more innovative in offering their products and services to the market as well as to the society

During the last two decades, there have been various innovations in terms of the technologies and service developed which have come to number among the tools, which can be potentially exploited to resolve many of the major problems. The innovation is the strategic tools to promote country competitiveness at the same time it needs "mass of competence and resources" (Andersson, 2006). Globally there is increasing innovation, which stimulates the growth of both employment and equities (Vest, 2007). Lebret et al., (2006) study reveals that the "innovation has a lot of

failure built into it, and innovation is about tolerating those failures. Innovation means tolerating the fact, that failure is a part of the game. Innovation means celebrating failures as the first step in the process"

According to Drucker (1993), innovation is an application of knowledge to produce new knowledge. Innovation can enhance and add value to the nations and improve the quality of life fo local people. It also boosts the local economy, social development and alleviate from the poverty as well as create sustainable growth of local economies and prosperity for the society as a whole. Rubenstein (1989) defined innovation as "the process whereby new and improved products, processes, materials and service are developed and transferred to a plant and/or market where they are appropriate".

People make a living through innovation and creation, thus large amount of funding is needed for the research and development (International Chamber of Commerce, 2005). To stimulate the innovativeness, environment or platform of innovation need to be created where researchers develop their network and share or disseminate knowledge to the knowledge users. The industry need the fast innovation that they can reach to the market in advance before their competitor comes in the market. For instance computer tablet market. Universities and industry need to work together to produce innovative products and services (Vest, 2007).

Thus, HEIs are the key to innovation and to be innovative is critical to the success of individual, firms, institutions, government and the social and economy of a nation as a whole (James, 1997; Russo, 1997; Marques et al., 2006; Asheim et al., 2009; Asheim & Parrilli, 2012). Public policies encouraged universities to stretch that role in order to further technological innovation and regional economic development (National Academy of Sciences, 2002; Geiger, 2004;). Oplatka and Hemsley-Brown (2010) stated that universities are under "pressure of conformity to adopt changes and innovation that have the support and endorsement of key agencies in the institutional environment, such as the government, industry and financial agencies". Universities play the dominant role in developing major innovation such as computers, internet, global positioning satellite system, numerically controlled machine, genetic revolution and modern medicine (Vest, 2007). Moreover, universities tend to embody the scientific knowledge that contributes towards the scientific and technological innovation (Otsuka, 2012).

Traditionally, innovation within universities have developed because of strategies and planning designed by those at the top. However, there are innovations from bottom as individual actors such as researchers and academicians individual interest identify the solution for the problems faced by the society or particular industry (Bonauti, 2003). Laursen & Salter (2006) argued that firms who are more open to "external sources or search channel are more likely to have a higher level of innovative performance". They emphasized that the openness to external sources "allows companies to draw on ideas from outsiders to deepen the pool of technological opportunities for them".

Innovation is directly responsible for the dynamism of different sectors of the nations and it's also seen as strategic tools to promote nation's competitiveness in a globalized world. Therefore, HEIs play very vital role in innovating different types of products and services. In HEIs, the innovation can be categoried in three main areas namely teaching innovation technological innovation and program innovation.

1) Teaching innovation

University teaching should ensure that their students understand the technical requirement if not provide a platform to learn and discuss about the technicality of the technology. This enhances and creates efficiency of usage of the available resources and develops the learning skill at the same time it is an innovative way of gaining knowledge (Locke et al., 2011). Teaching innovation, the most of the innovations in teachings in universities comes from the industry where they view the universities or colleges as a major player in the social and service development (Chapman, 2006).

Nevertheless, better decisions and updated regulatory programs will enhance innovation, improve quality of environment, secure economic future, and give a better quality of life to every citizen of the country. Many HEIs are accelerating their innovative research and activities, as they are the key to innovation. HIEs are the sources of innovation.

2) Technological innovation

The technological innovation (TI) is the lifeblood of the high-tech companies as they are driven to compete globally. Therefore, the universities play platform for the innovation with support from the industry and TI is a main part of the

educational institute (Chapman, 2006). Innovation helps universities to generate income for them. For instance, Stanford University, generate an average of 40$ Million in royalties per year from its all-successful ventures in innovation (Lebret et al., 2006).

3) Program innovation

In addition to the TI, university leaders need to encourage their faculty members to offer an innovative program either a degree or diploma or certificate program. Program innovation needs to encourage knowledge workers to develop values for society and values of social responsibilities as well as generate knowledge society. The constructive program innovation "can provide learning for democratic citizen in higher education" (Arthur and Bohlin, 2005).

The program innovation could be through providing multidisciplinary degree program, where the knowledge is learnt and adapt the different discipline. For instance, Asian Institute of Technology (AIT), based in Thailand is providing master and doctoral degree program in Disaster Preparedness, Mitigation and Management degree program. Under this program, knowledge workers are able to learn how "to manage and minize the effect of disasters in people on the front lines of disaster response and preparedness. The courses under this program are designed to accommodate scholars with engineering, architecture, natural and social science, as well as management background" (AIT, 2013).

3.2.7 Infrastructure

HEIs Infrastructure plays a significant role in building HIEs for society and as a source of attraction for experts, researchers, decision makers and scientists (Baccaïni and Dutreuilh, 2007; Pero, 2011). The establishment of university infrastructure is to "raise the important issues of ownership, management, operation, use and economics" (Kettinger, 1994). Thus, HEIs need the right infrastructure to make knowledge and skill available to their scholars: faculty, staff and students. It is the pillar in sustaining the HIEs for building nations toward KBS. It is also the crucial element in facilitating the development of HEIs.

HEIs designed the knowledge infrastructure that needed for the nation's growth and prosperities. However, universities itself need the better infrastructure to

facilitate the knowledge workers to produce knowledge. The ultimate motivation of the university should be improving their infrastructure rather than just preserving their existing set up (Yusuf and Nabeshima, 2007). To improve and bring creation and innovation in the university, infrastructure is one of the strongest factor (Chapman, 2006) that push university towards KBS.

Typically, the state government funds the infrastructure of the universities especially for the public universities. Some part of the private universities are supported by the state government and the rest are from the private sectors. However, last few decades there have been budget cut on public spending on the public universities. This led to some difficulties (Michael and Kretovics, 2005). Infrastructure is very much needed for the universities to produce knowledge worker. Without proper infrastructure, it would be difficult for universities to survive and produce innovative and competitive knowledge workers, including handicapped scholars.

Teaching members or faculty members who transfer their knowledge, need to have proper infrastructure to teach potential leaders or knowledge workers. At the same time, to operate the universities, it needs a proper operational infrastructure that supports the core activities concentrated within the campus (Chapman, 2006). Good physical presence of universities' infrastructure shows the important aspects of institutional culture. This reflects the university's mission and its historical and traditional concept of learning environment where scholars seek their career to foster. Having a good infrastructure creates good learning atmosphere and culture (Chapman, 2006).

Furthermore, government policy on the infrastructure development of HEIs play very important role for the development towards KBS. The investments in HIEs infrastructure produce both direct and indirect impacts on the institutes such as accept, retain, and graduate students with baccalaureate degrees into the county economy as well as the enhanced productivity and produce new knowledge areas. HEIs infrastructure, also provide the primary platform to build the knowledge infrastructure for the country. Thus it is very essential for HEIs to have a proper infrastructure requirement for the future leaders to gain and study at the HEIs.

3.2.8 Information and Communication Technology (ICT)

In the current dynamic environment, Information and communications technology (ICT) play an important role in fostering and enriching the corporate and development sectors as well as nation building towards KBS. ICT has the potential to improve all aspects of one's social, economic and cultural life. The introduction of ICT in HEIs change the way education is conducted in modern society as well as improves the quality of teaching, learning and research (Cartelli, 2009; Ani & Edm, 2011; Oye et al., 2012).

In the globalized world, ICT plays an important role in lives and economics. ICT is a vital component for various countries to enter the "new economy," sometimes referred to as a "knowledge-based society" or information society. It plays instrumental tools in leapfrogging sustainable development for the emerging economies.

The use of ICT is increasingly being seen as an important contributor to the achievement of national development goals. 55.2 billion US$ ICT consumption is by the emerging markets like Bangladesh, Sri Lanka, Pakistan, Vietnam, China, and India in 2006 and the combined spending on ICT reached nearly $105 billion in 2011 (IDC, 2013). The Futuretimeline (2013) estimated that by 2020, the number of internet users will be around 5 billion. In addition, Asia is the highest users of internet: 44.8 percent, if compared to other continents as shown in the above table 3. 8.

The ongoing revolution in the field of ICT is influencing every aspect of human activity and endeavor. In addition, "differences in access to ICTs such as computers and the internet create a 'digital divide' between those able to benefit from opportunities provided by ICTs and those who cannot" (Vickery, 2002). In addition, "ICTs play a role in both public perceptions of regional conflicts and terrorist organizations as well as the operations within conflicts and conducted by terrorists" (Jefferson, 2007).

ICT is considered in the context of eight millennium development goals (MDGs) on global partnership: "In cooperation with the private sector, make available the benefits of new technologies, especially information and communications", ICTs are tools for achieving social goals as spelt out in the MDGs. Whether as an important sector of economic activity, a platform for information exchange or a tool to implement applications, ICT can play a catalytic role as an enabler to develop.

Kenny (2003) says “Giving internet access to the World’s poorest will cost a lot and accomplish little”, Poor countries face many serious divide, including those in education, healthcare, and transportation. The relevant question for the poorest is, does the lack of access to a particular good provide a significant barrier to become wealthier? The answer is yes for the tools of communication in general but not for the internet in particular.

Table 3.8 Word Internet Usage and Population Statistics

World Regions	Population (2012 Est.)	Population % of World	Internet Usage, Latest Data	% Population (Penetration)	Usage % of World	In % Usage Growth 2000-2012	User % Tablet
Africa	1,073,380.925	15.30	**167,335,676**	15.60	03.40	3,606.70	07.00
Asia	3,922,006,987	55.90	**1,076,681,059**	27.50	38.70	841.90	44.80
Europe	820,918,446	11.70	**518,512,109**	63.20	26.40	393.40	21.50
Middle East	223,608,203	03.19	**90,000,455**	40.20	02.50	2,639.90	03.70
North America	348,280,154	04.96	**273,785,413**	78.20	18.00	153.30	11.40
Latin America/ Caribbean	593,688,638	08.46	**254,915,745**	42.90	09.60	1,310.80	10.60
Oceanic / Australia	35,903,569	00.51	**24,287,919**	67.60	01.50	218.70	01.00
WORLD TOTAL	7,017,846,922	100	**2,405,518,376**	34.30	100.00	566.4	100

Source: Adopted from Internet World Stats, 2013.

United Nations have identified four major sets of indicators for complete ICT diffusion in a country and these are: ICT infrastructure and access; 2) Access to and use of ICT by household and individual; 3) Use of ICT by business and 4) ICT sector and trade in ICT goods. ICT helps the university education to reach to the masses and also support in managing the data, information and knowledge to make better decision making. Previous studies show that there is significant influence of ICT on the

education and its contribution toward country development as well as to the knowledge society (Weert, 2005b).

The internet users in Mekong region are from minimum 534,930 (Myanmar) to 31,034,900 (Vietnam) people, which is less as compared to the total population as shown in the table 3.10.

Table 3.9 Mekong Region Internet Usage and Population Statistics

Mekong Regions	Population (2012 Est.)	Population % of World	Internet Usage, Latest Data (30 June 2012)	% Population (Penetration)	Usage % of Asia (27.5%)	Facebook (31 Dec. 2013
Cambodia	14,952,665	06.37	662,840	04.40	0.10	742,220
Laos PDR	6,586,266	02.81	592,764	09.00	0.10	255,880
Myanmar	54,584,650	23.25	534,930	01.00	0.00	n/a
Thailand	67,091,089	28.58	20,100,000	30.00	1.90	17,721,480
Vietnam	91,519,289	38.99	31,034,900	33.90	2.90	10,669,880
Total	234,733,959	100	**52,925,434**	100		

Source: Adopted from Internet World Stats, 2013.

Growing pressure of usage of ICT in universities lead to universities to adopt ICT policy, where offering of academic program are done with the support from ICT. Okiy (2005) study found that inadequate and lack of ICT application in universities librairies led to the low level of computer literacy among Nigerian. Lack of access to ICT tools will impact on the growth of knowledge, skill and competency development of the knowledge workers as well as impact on the whole industry including education sector (Hanna, 2010; Piaggesi et al., 2011). In addition, universities lacking in adequate facilities to implement the ICT procedures into teaching learning process will impact on the country development as well as for the country economic development.

Globally majority of the universities are well connected with ICT and use as instrumental tools in developing knowledge as well as creating knowledge for the future generation (Azevedo, 2013). In Thailand first ICT master for education development was initated by Ministry of Education and it was from 2004- 2006. The second master plan was from 2007-2011. Focus of using ICT in education was to improve the academic quality and also create equal opportunities to access education (Tubtimhin & Pipe, 2012). Under the ICT policy for education, ICT infrastructures for universities were to build and to connect every university to connect internet for education and research. At the same time universities were to play the central hub in connecting other national and international network through UniNet. Government has encouraged all universities to collaborate and share the education resources between universities.

Table 3.10 shows the summaries of various scholars' studies related to the Contribution of Universities towards Economic and Social Development as well as building nation towards KBS.

Table 3.10 Summaries of Scholar's Studies Related to the Contributions of University Building Nations Towards KBS

Study Areas	**Authors/Scholars**
Knowledge Society	Audretsch et al., 2012; Fukugawa, 2012; Franzen et al., 2012; Hines, 2012; Ergazakis & Metaxiotis, 2011; Angsana Techatassanasoontorn et al., 2011; Castells, 2010; Kefela, 2010; Melnikas, 2010; Hamid & Zaman, 2009; Ace, 2008; Beerkens, 2008; Sharma et al., 2008a; Sharma et al., 2008b; Graham & Dickinson, 2007; Materu, 2007; Rohrbach, 2007; Zeleza, 2007; Kumar, 2005; UNESCO, 2005; Etxebarria & Uranga, 2004; Stehr, 1994; Elermann et al., 2004; Spangenberg & Mesicek, 2002; Bell, 1973; Lane, 1966

Table 3.10 (Continued)

Study Areas	Authors/Scholars
Higher Education	De Boer et al., 2010; Maringe & Foskett, 2010; Shi & Neubauer, 2009; Baker & Wiseman, 2008; Keller, 2008; Santiago et al., 2008; Sharma et al., 2008a; Sharma et al., 2008b; Singh, 2008; Chapman, 2006; Santos, 2006; Funnekotter, 2005; Michael & Kretovics, 2005; Hermans & Nelissen, 2005; Weert, 2005a; Geiger, 2004; Giroux, 2001; Jarvis, 2001; UNESCO, 1998.
Human Capital	Boccanfuso et al., 2012; Blanden, et al., 2012; Zaman et al., 2012; Abel & Deitz, 2011; Chan & Ngok, 2011; Gertler et al., 2011; Hrabinová et al., 2012; Hu, 2011; Kurtz & Brooks, 2011; Levine & Levine 2011; Meara, 2011; Mitra et al., 2011; Ogunade, 2011; Stark et al., 2011; Douglass, 2010; Lee & Ruth, 2010; Bong-Dae, 2009; Kirchsteiger & Sebald, 2009; UNDP, 2009; Hanushek & Woessmann, 2008: Brempong et al., 2006; Mayo, 2005; Michael & Kretovics, 2005; Douangngeune et al., 2005; Goldstein & Renault, 2004; Bontis, 2004; Mohan & Mohan 2002; Dzinknowski, 2000; Booth, 1999; OECD, 1998; Becker, 1993; Sen, 1993; Schultz, 1961.
a) Knowledge	Chen, 2012; Ramezan, 2011; Cohen & Kisker, 2010; Collins, 2010; Ozmen, 2010**;** Wang & Thorns, 2009; Bolisani, 2008; Becerra et al., 2008; Elenurm, 2008; Matsuura, 2007; Riege, 2005; Clarke, 2003; Firestone & McElroy, 2003; Al-Hawamdeh & Hart, 2002; Ambrosini & Bowman, 2001; European Planning Unit, 2001; Smitt, 2001; Sveiby, 1997; Mårtensen, 2000; Martin, 2000; Hadlin-Herrgard, 2000; Hedesstrom & Whitley, 2000; Hansen et al., 1999; Stiglitz, 1999; Simonin, 1999; Davenport & Prusak, 1988; Perruchet et al., 2007; Miner & Mezias, 1996; Grant, 1996; Nonaka & Takeuchi, 1995; Stehr, 1994; Drucker, 1993; Reber, 1993; Barney, 1991; Nonaka, 1991; Polanyi, 1967.

Table 3.10 (Continued)

Study Areas	Authors/Scholars
b) Skills	Abel & Dietz, 2011; Culin & Scott, 2011; Rahman et al., 2011; Bridgstock, 2009; DuBrin, 2009: Hamzah & Abdulla, 2009**;** Yu & Velde, 2009; Silva, 2009; Velde, 2009; Daft, 2008; Sanghi, 2007; Ballantine & McCourt, 2004; Tait & Godfrey, 1999.
a) Competency	Fabbris et al., 2011; Martinez, 2008; Connor & Pokora, 2007; Sanghi, 2007; Guzman & Wilson, 2005; Minbaeva & Michailova, 2004; Prien et al., 2003; Brophy & Kiely, 2002; Fraser & Greenhalgh, 2001; Beerel, 2009; Whiddett & Hollyforde, 1999; Whiddett & Hollyforde, 1999; Rowe, 1995; Hoffmann, 1999.
Governance	Bastedo, 2012; Altbach et al., 2011; Taylor, 2010; Heaney, 2010; Ferlie et al., 2009; Geuna & Muscio, 2009; Fielden, 2008; Keller, 2008; Piotrowski, 2007; Bleiklie & Kogan, 2007; Toma, 2007; Farazmand & Pinkowski, 2006; Neave, 2006; Shattock, 2006; Hood et al., 2004; Joanne & Christian, 2003; Menon, 2003; Kovač et al., 2003; Sporn, 2003; Tighe, 2003; Amaral et al., 2002; Mook, 2002; De Boer & Geodegebuure, 2001; Shiroyama, 2001; Baird, 1997; Boyer, 1987.
a) Accountability	Amir et al., 2012; Liu, 2011; Robinson et al., 2011; Bovens, 2010; Santiago et al., 2008; Leveille, 2006; Michael, 2005; Burke, 2004 and 2005; Ingram, 2004; Huisman & Currie, 2004; Dunn, 2003; Sporn, 2003; Harvey & Askling, 2002; Vidovich & Slee, 2001; Coy et al., 2001; Alexander, 2000; Romzek, 2000; Baird, 1997; Goedegebuure et al., 1990; Smith, 1976; Kenneth, 1972; Corbett, 1922 in Vidovich & Slee, 2001.

Table 3.10 (Continued)

Study Areas		Authors/Scholars
Academic Quality	b) Transparency	Backer, 2012; Hardi & Buti, 2012; Meijer, 2012; Vaccaro & Sison, 2011; Bennis et al., 2008; Pagano & Pagano, 2003.
	Culture	Santiago, et al., 2008; Dill, 2006; Stamoulas, 2006; Dill & Soo, 2004 and 2005; Baldridge et al., 2004; DFES, 2003; Woodhouse, 1999; Vroeijenstijn, 1995; Baird & Oppenheim, 1994; Johnson & Podsakoff, 1994.
	Research	Fralinger & Olson, 2007; Arthur, 2005; Reeves, 1988; Chapman, 2006; Tierney, 1998. Kuh &Whitt, 1998; Leininger, 1995; Peterson & Spencer, 1990; Reeves, 1988; Sanford, 1970.
	Innovation	Zaman et al., 2011; Vest, 2007; Sharma et al., 2008a; Sharma et al., 2007; Santiago, et al., 2008; Bernard, 2007; Ergazakis et al., 2006; Lebret et al., 2006; Shapira et al., 2006; International Chamber of Commerce, 2005; Bushaway, 2003; Kendall, 2011; Grinnell, 1993; Grinnell, 1997.
		Asheim & Parrilli, 2012; Otsuka, 2012; Locke et al., 2011; Baden-Savin, 2010; Oplatka & Hemsley-Brown, 2010; Wall & Ryan, 2010; Workman, 2010; Asheim et al, 2009; Vest, 2007; Andersson, 2006; Chapman, 2006; Gammon, 2006; Laursen & Salter, 2006; Lebret et al., 2006; Marques et al., 2006; Arthur & Bohlin, 2005**;** International Chamber of Commerce, 2005; Geiger, 2004; Bonauti, 2003; National Academy of Sciences, 2002; James, 1997; Russo, 1997; Rubenstein, 1989; Drucker, 1983.

Table 3.10 (Continued)

Study Areas	Authors/Scholars
Infrastructure	Pero, 2011; Baccaïni & Dutreuilh, 2007; Yusuf & Nabeshima, 2007; Michael & Kretovics, 2005; Chapman, 2006; Kettinger, 1994.
ICT	Oye et al., 2012; Ani & Edem, 2011; Cartelli, 2009; UNESCO, 2009; Jefferson, 2007; IDC, 2013; Kenny, 2003; Vickery, 2002.

3.3 Conceptual Framework

Previous studies clearly indicates that to build the nation towards the knowledge based society, universities or HEIs play an important roles and it depend on the production of various factors as well indirect factors. Many scholars do agreed that the HEI is the station of production of new knowledge that can leverage for the country development and enhance further towards knowledge society. It is the stations, where every individual nurture himself or herself to grow for better intellectual persons. These accumulations of knowledge further strengthen the country human capital, which are major resources of the sustainability development of the country.

In this study, researcher accumulates literature (see table 3.11) related to HEI especially focusing on the factor's contribution towards building nation towards knowledge-based society. These factors are human capital; governance; culture; research; innovation; information communication and technology; and infrastructure. Based on this factor, the researcher developed the conceptual framework for this study and develops the hypothesis to test the significance of these factor contributions towards KBS. This framework suits the context of this study. Based on the conceptual framework shown in the figure 3.1, following research questions are raised to further investigate the research framework.

(1) Do the human capital, governance, culture, research, innovation and infrastructure directly or indirectly influence the contribution of universities towards Thailand becoming a KBS?

(2) Do Academic Quality and Information Communication Technology (ICT) directly influence the contribution of universities towards Thailand becoming a KBS?

3.3.1 The Foundation of the Conceptual Framework

There is limited study regarding indicator of the HEI contribution towards KBS. This study aims to investigate and analyze the factors contribution of Thai higher education institutions: research universities, towards Thailand becoming knowledge based society.

The conceptual framework is based on two theories namely grounded theory and system theory. Grounded theory helps the conceptual framework to evolve from the data. Glaser and Strauss developed the Grounded Theory in 1967. According to Charmaz (2006), grounded theory "favors analysis over description, fresh categories over preconceived ideas and extant theories, and systematically focused sequential data collection over the large initial sample". In addition, this theory needed the researcher to carry out the data analysis during the data collection stages of the research. The basis for grounded theory urges individual to keep social interactions and bring their own definitions, meanings and interpretations (Crooks, 2001).

Using this theory, analysis means informing and guiding data collection. In this study, researcher applied the grounded theory especially using interviewing the decision maker of the research universities and the government policy makers. Based on the study's assumption, the researcher asked following questions based on the conceptual framework shown in figure 3.1:

(1) How KBS is defined and understood by the decision makers in the context of Thailand development towards KBS?

(2) What is the focus of the government on higher education institution to work their outcome on bringing Thailand toward KBS?

(3) What are the main factor in universities contributing toward country to become a knowledge society?

Furthermore, the system approach theory approached is used which offers a basic understanding and is as a vehicle to analyze the situation (Parry, 1998; Kreitner & Kinicki, 2009; Zastrow & Kirst-Ashman, 2009). Each theory provides a unique path for better understanding the policy making. "System theory provides a flexible framework for incorporating aspects of each theory analytics, a framework that connects in a multifaceted web of relations" (Luton, 1996).

Moreover, the different environment and different situation consists of various systems itself. The interaction of each system in the environment would not be closely investigated since they are actually part of the whole system. In this research, such systems and their interactions are considered as the only variables, which affect the output or the policy outcomes. These variables are therefore the main focus of the research study. These variables are derived and yielded from literature reviews as shown in the Table 3.11. The variables are based on a variety of theories and frameworks postulated by scholars from different fields to form conceptual framework which suits to the context of this study. To explain the factors contributions of universities towards country becoming KBS, the study consist of major factors which determines contribution of university towards building nations toward KBS. Variables are categorized in two main variables: Dependent variables and Independent variable.

1) Dependent Variable

Contribution of University towards country development is immense and especially in leapfrogging the country toward the Knowledge Based society. This deserves much attention from policy makers and implementors. Thus, the contribution of Thai universities toward Thailand becoming KBS deserves much attention and is suitable to be the dependent variable for this study.

2) Independent Variables

From the study framework presented in figure 3.1, the major factors which are expected to have strong positive influence over contribution of universities toward KBS includes human capital, governance, academic quality, culture, research, innovation, infrastructure, and information and communication technology. The anticipated interrelations are as follows:

(1) Human capital is expected to be positively and directly related to Contribution of University toward building a nation towards KBS. It also posits indirect influence on the Contribution of University toward building nations towards KBS with Academic Quality and Information and Communication Technology.

(2) Governance affects the Contribution of University toward building nations towards KBS and has relationship with Academic Quality and Information and Communication Technology.

Table 3.11 Relationship between Variables Included in the Conceptual Framework

#	Independent Variables	Dependent Variable	Theoretical/Empirical References
1.	Human Capital	Contribution of University	Culin & Scott, 2011; Mitra et al., 2011; Ramezan, 2011; De Boer et al., 2010; Ozmen, 2010**;** Cohen & Kisker, 2010; Wang & Thorns, 2009; Velde, 2009; Hanushek & Woessmann, 2008: Brempong et al., 2006; Douangngeune et al., 2005; Bontis, 2004; Ballantine & McCourt, 2004; Goldstein & Renault, 2004.
2.	Governance	Contribution of University	Liu, 2011; Heaney, 2010; Geuna & Muscio, 2009; Shattock, 2006; Fielden, 2008; Santiago et al., 2008; Leveille, 2006; Michael, 2005; Burke, 2004 and 2005; Huisman & Currie, 2004; Hood et al, 2004; Dunn, 2003; Kovač et al., 2003; Menon, 2003; Romzek, 2000; Smith, 1976; Kenneth, 1972.
3.	Culture	Contribution of University	Fralinger & Olson, 2007; Chapman, 2006; Arthur, 2005; Reeves, 1988.

Table 3.11 (Continued)

#	Independent Variables	Dependent Variable	Theoretical/Empirical References
4.	Research	Contribution of University	Zaman et al., 2011; Santiago, et al., 2008; Grinnell, 1997 and 1993; Sharma et al., 2008a; Sharma et al., 2007; Vest, 2007.
5.	Innovation	Contribution of University	Asheim & Parrilli, 2012; Asheim et al., 2009; Marques et al., 2006; James, 1997; Russo, 1997;
6.	Infastructure	Contribution of University	Pero, 2011; Baccaïni & Dutreuilh, 2007; Yusuf & Nabeshima, 2007; Michael & Kretovics, 2005; Chapman, 2006; Kettinger, 1994
7.	Academic Quality	Contribution of University	Dill, 2006; Dill & Soo, 2004 and 2005; Baldridge et al., 2004; DFES, 2003; Woodhouse, 1999; Vroeijenstijn, 1995; Baird & Oppenheim, 1994; Johnson & Podsakoff, 1994.
8.	Information and Communication Technology	Contribution of University	Oye et al., 2012; Ani & Edm, 2011; Cartelli, 2009; Jefferson, 2007; Kenny, 2003.

(3) Culture affect the Contribution of University toward building nations towards KBS and has relationship with Academic Quality and Information and Communication Technology

(4) Research tends to affect Contribution of University in building nations towards KBS in a way that higher the research activities, the higher contribution of universities towards building nations towards KBS. When Research is relatively influencial, it tends to pose positive effects on Academic Quality and Information and Communication Technology.

(5) Innovation is expected to be positively and directly related to Contribution of University in building a nation towards KBS. It also posits indirect influence on the Contribution of University in building nations towards KBS with Academic Quality and Information and Communication Technology.

(6) Infrastructure expected to be positively and directly related to Contribution of University in building a nation towards KBS. It also posits indirect influence on the Contribution of University in building nations towards KBS with Academic Quality and Information and Communication Technology.

(7) Academic quality and Information and Communication Technology has direct influence on the Contribution of University in building nations towards KBS.

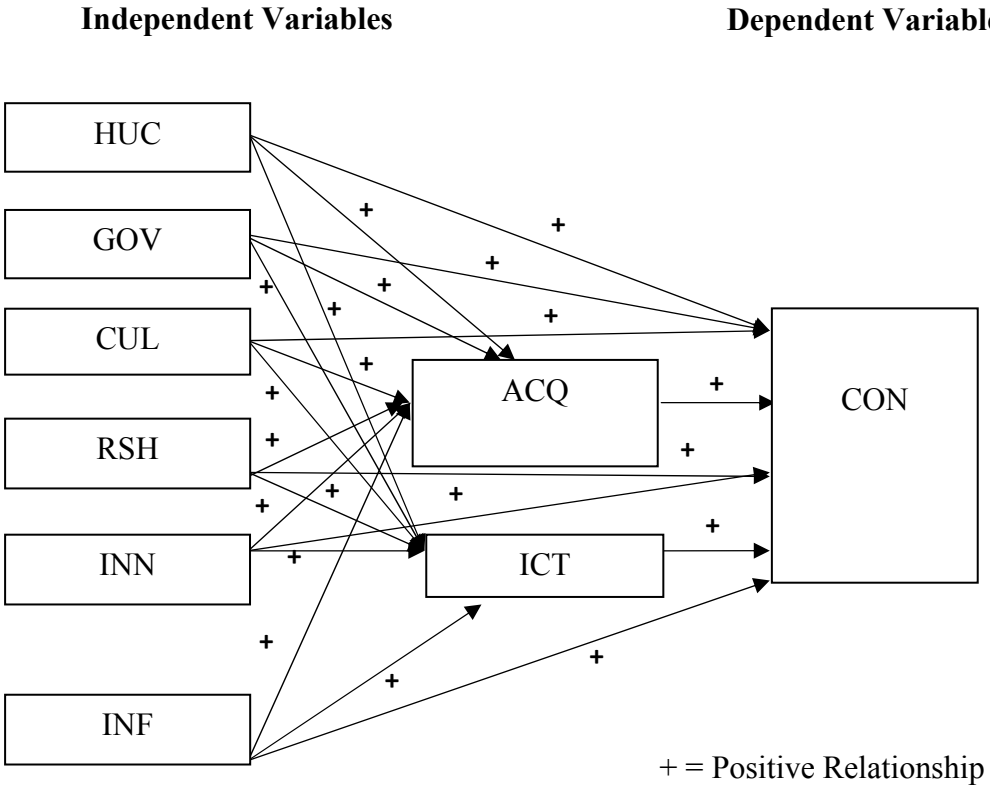


Figure 3.1 Conceptual Framework

The above figures shows that eight independent variables directly influence the contribution of the university towards Thailand becoming a Knowledge Based

Society. In addition, there are also two mediating variable and these are the Academic Quality and Information and Communication Technology. Human capital, Governance, Culture, Research, Innovation and Infrastructure tends to affect the contribution of university in a way that more of these variables, the greater is the effect of contribution of university towards Thailand becoming KBS. From the above figure, the acronyms represent the following construct:

1) CON represents Contribution of University towards Thailand becoming a KBS;
2) HUC represents Human Capital;
3) ACQ represents Academic Quality;
4) GOV represents Governance;
5) CUL represents Culture;
6) RSH represents Research;
7) INN represents Innovation;
8) INF represents Infrastructure;
9) ICT represents Information and Communication Technology.

3.3.2 Hypothesis

Based on the study's assumption, factors related to the human capital, governance, academic quality, culture, research, innovation, infrastructure, and information and communication technology, are examined and developed three main hypotheses.

Based on the figure 3.1, following three hypotheses are developed for this study and also the equations have beend developed.

1) Hypothesis 1: The Academic Quality, Information and Communication Technolgy, Human Capital, Governance, Culture, Research, Innovation, and Infrastructure has direct significant influence in Contribution of University towards Thailand becoming a KBS

2) Hypothesis 2: Human Capital, Governance, Culture, Research, Innovation, and Infrastructure have indirect significant influence in contribution of University towards Thailand becoming a KBS through Academic Quality.

3) Hypothesis 3: The Human capital, Governance, Culture, Research, Innovation, and Infrastructure have indirect significant influence in Contribution of University towards Thailand becoming a KBS through Information and Communication technology.

$$CON = \beta_1 HUC + \beta_2 GOV + \beta_3 CUL + \beta_4 RSH + \beta_5 INN + \beta_6 INF + \beta_7 ACQ + \beta_8 ICT \quad (1)$$

$$ACQ = \beta_{21} HUC + \beta_{22} GOV + \beta_{23} CUL + \beta_{24} RSH + \beta_{35} INN + \beta_{26} INF + \beta_{27} ICT \ldots \quad (2)$$

$$ICT = \beta_{31} HUC + \beta_{32} GOV + \beta_{33} CUL + \beta_{34} RSH + \beta_{35} INN + \beta_{36} INF + \beta_{37} ACQ \ldots \quad (3)$$

3.3.3 Rationale of Hypotheses

All the factors are constructed based on **system approach theory** from the information or data collected from the literature review. All are inputs in the same surroundings that might or might not interact with each other but they should have some direct or indirect influence on the contribution of university toward Thailand becoming a knowledge society, which is the output of the system. The degree of the influence level was tested by the statistical results from the questionnaires. The two hypotheses, which predict the relationships of these input and output factors were constructed and discussed. These three hypotheses were proposed to describe the factors contributions by the Thai HEIs towards the Knowledge based society.

In summary, this research framework is based on the “system approach” theory, which explores and tests the inputs and outputs of the policy as described below:

(Inputs)	Influence Level		
	High	**Moderate**	**Low**
Human capital	√		
Governance		√	
Academic Quality	√		
Culture		√	
Research	√		
Innovation	√		
Infrastructure	√		
Information and Communication Technology	√		

3.4 Summary

This chapter explains and discusses the review of literature on the main factors expected to be significantly related to the Contribution of University. The conceptual framework is based on the literature review and specifying relationship among the variables. The Contribution of University is the dependent variable expected to be explained by eight independent variables. Based on the hypothetical relationship of all variables, three hypotheses are developed to carry out the empirical study. The next chapter presents the research methodology of this study.

CHAPTER 4

RESEARCH METHODOLOGY

In this chapter research methodology is explained and presented the method of analysis and also interpretations of the factors that influence HIE toward KBS. Researcher applied mixed method approach.

4.1 Research Design

The organization of the methodology used herewith illustrated in the diagram given below in Figure 4.1.

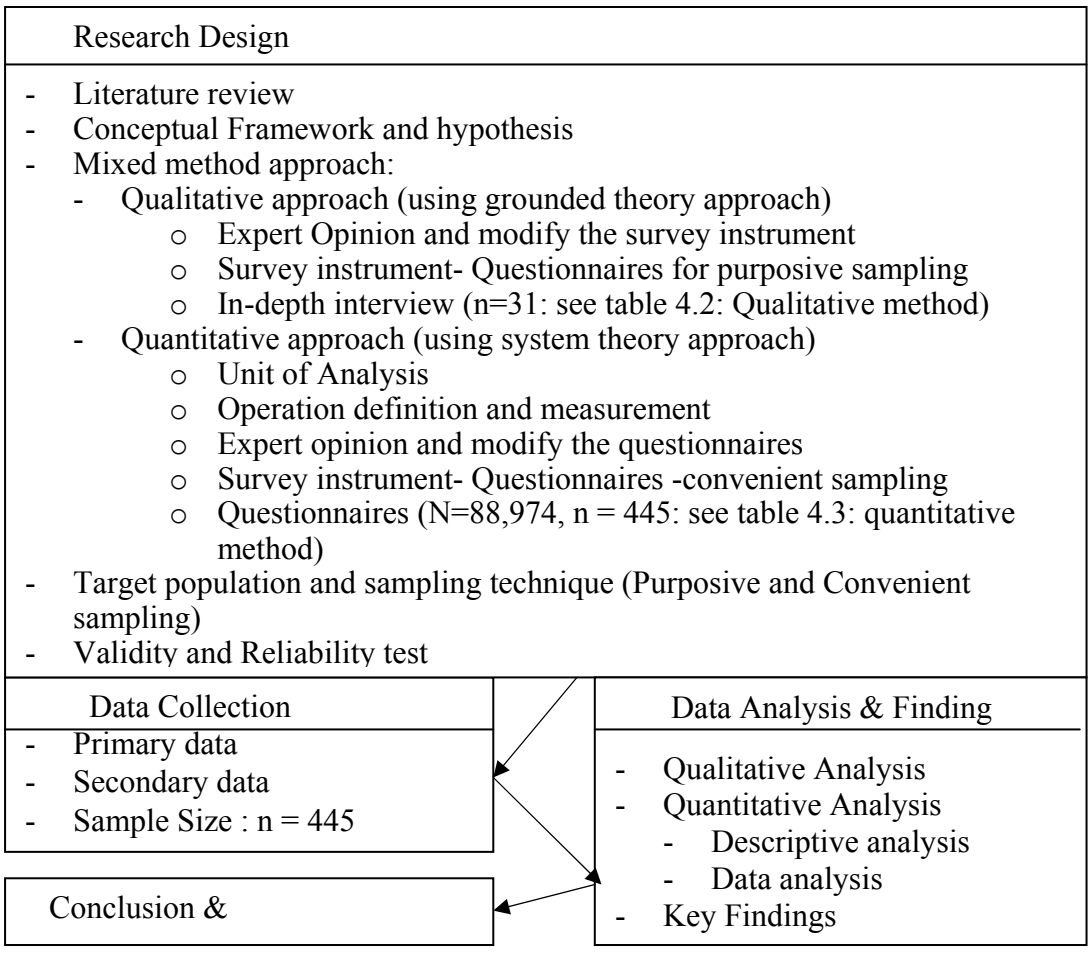


Figure 4.1 Research Design

The above chart addresses how to achieve the objectives of this study through scientific observation and verification, which is different from the organization of research tasks. In this research, the researcher will use mixed method approach: qualitative and quantitative.

4.2 Mixed Method

In the mixed method research, the researcher combined the qualitative and quantitative research approaches to analyse the data and information in-depth to understand and analye the research problem (Johnson et al., 2007; Creswell, 2009). Combining the qualitative and quantitative method is effective and efficient to overcome the limitation of using either of one of this method as well as reducing the gap in facilitating the data collection process in producing rich data (Sieber, 1973; Rossman & Wilson, 1985; Creswell & Vicki, 2011). It also facilitates in clarifying the rich data and information. According to Tashakkori and Creswell (2007), defined mixed method is as “research in which the investigator collects and analyses the data, integrates the findings, and draws the inference in single study or program of inquiry”.

The purpose of employing the mixed method in this research is to support the qualitative method by quantitative method. Mixed method support in reducing the gap in understanding the concept of knowledge society in the context of Thailand’s Higher Education as well as study the factors contribution of Thai research universities toward Thailand becoming a knowledge society. More details of the each method of mixed methods are as follows:

4.2.1 Qualitative method

Qualitative method concerns with subjective and the researcher used open-ended questions with two forms namely central question and associated sub-questions (Creswell, 2009 and 2012). The central question concerned with contribution of Thai research universities towards Thailand becoming knowledge based society and concept of KBS perspective from Thailand. The researcher used the open-ended questions.

The expert's opinion is requested on the open-ended questions based on the research topic so that, no required information will not be missed during the interview for this study. Five experts were requested to provide feedback on the open-ended questions. These experts are Vice President for Academic Affairs of Asian Institute of Technology, Journalist working in the academic, Academic Senate Secretary of this institution and another two experts, who promote the institution in the international market. Based on their feedback, open-ended questions were framed in simple format and to the point (Appendix F).

Qualitative research as "modes of systematic inquiry concerned with understanding human beings and he nature of their transactions with themselves and with their surroundings" (Benoliel, 1984). Qualitative research is mainly based on the premise of describing human experience as it is lived and defined by the individual himself (Lincoln and Guba, 2000).

4.2.1.1 Unit of analysis for the qualitative method

The individuals, who are the decision makers in 9 research universities and the government policy makers, former minister and the senior executives of international organization and the media are the unit of analysis for the qualitative approach. In this study, the researcher seeks perceptions of the respondent's practical practices and understanding on the items or the variables provided in the questionnaires.

4.2.1.2 Purposive sampling

The researcher applied the purposive sampling technique for the qualitative approach of this study. The selections of the experts are described below in Table 4.2 under three categories. Intention of categorizing the experts is to get the maximum and best help from them on the addressed the research questions of this study (Appendix F) not comparing their opinion. As per grounded theory, methodology compels one to gather data until the point of theoretical saturation. Charmaz (2006) defined that theoretical saturation as "the point at which gathering more data about a theoretical category reveals no new properties nor yield any further theoretical insight about the emerging grounded theory".

4.2.1.3 Validity and Reliability

The research carried out the validity and reliability check in regards to the qualitative method. The validity of the qualitative data is approached in two

levels: internal validity and external validity. The internal validity is carried out by studying the expert qualification and their involvement in the subject matter of this study. The external validity is carried out by identifying the person from each category based on their experience and the position they held relative to this study.

The researcher identified the information about the experts through their websites and contacted accordingly. The researcher ensured that purposive sampling included a variety of sources by interviewing different experts on the given study. The decision makers and informants are called “Expert” in this study, as they are heavily involved in the higher education sector.

In the first step, the researcher collected the contact number of the experts and called their assistants to get the contact details of the experts. In the second step, researcher contacted the experts either directly or indirectly through her or his office and support from the researcher connection. The researcher sent the request letter through email together with the set of interview guide (open-ended questions) to each expert (Appendix G) and request for the appointment or meeting date. This allowed the experts to prepare in advance to answer questions more freely and spontaneously to give respondents an opportunity to brainstorm, offer recommendations and exchange views on addressed questions.

More than 100 experts contacted through email and by phone called as well as through, the researcher’s network with the expectation that minimum of 40 percent will allow meeting with them for this study. Follow up carried out three times to those 100 experts through phone calls and emails. However, 31 experts (Appendix F) agreed on the request and were then interviewed during month of January 2013 to March 2013. These experts are categorized in three groups as shown in Table 4.1.

All the experts in this study are Thai Nationalities except two experts, these two experts from the category 3 (Chinese and Korean). By the time, the researcher interviewed 20 experts; a point of saturation had likely been reached. However, the researcher continued to collect and analyze more data to ensure the saturation point to be reached.

1) Category 1: In this group, experts are from 9 research universities. These experts are the responsible persons in their universities. Most of these experts are having more than 10 years of experiences as an academician and are

also the leaders in their respective universities. These experts are long-term members in their universities. The researcher interviewed 17 experts under this category. Majority of these experts are involved in framing the policy of their university and they are the decision makers as well as engaged in multiple functions and responsible in their respective universities.

2) Category 2: In this group, experts are from the government officials and were former Ministers. These government officials and the ministers are involved in making Thailand education policy towards Thailand becoming a knowledge society. These government officials are experienced and have more than 15 year of experiences in this field. At the same time the Ministers are policy makers. E.g., Former Prime Minister of Thailand was interviewed for this study. During his tenure, his government through the Ministry of Education, made a decision of categorizing the Thai Universities into four groups, among this one group is called Research University. This study focuses on the research university, which composed of 9 universities. Nine experts interviewed under this category.

Most of the experts in category one and two, hold multiple responsibilities. Some of the experts are involved in the policymaking at the country level and at the university level. These experts also sit in different advisory boards either at government level in framing the government policy towards the knowledge societies as well as industrial development of the countries. Majority of these experts makes the policy for their universities. Name and title of these experts in the Appendix F.

Table 4.1 Categories and Number of Experts Interviewed**.**

#	Category 1	Category 2	Category 3
Number	17	9	5
Role	Responsible for making policy and implementing the policy as well as recommending policy change to the government	Responsible for policy making as well as support the universities in policy implementation	Responsible for reporting about the higher education sector also provide consultancy to the government in policy marketing or others
Experience	Above 10 years	More than 15 years	More than 5 years
Qualification	All experts are having a highest level of Academic Degree (PhD)	Out of 9, 6 of them with PhD degree and remaining with Master Degree	1 is with Phd Dregree; 3 of them have Master Degree in their respective field and one is pursing PhD
Gender	Female 2, Male 15	Female 2, Male 8	Female 2, Male 3

3) Category 3: In this group, experts are from media and international organizations, reports or work related to the higher education sectors. These experts are having more than 5 years of experiences in their field. Five experts interviewed.

4.2.1.4 Interviews

Establishing the trust with the experts in this investigation, researcher began with emphasizing on the confidentiality and briefed disclosure of the researcher relevant experiences. Since most of the experts were in a management or leadership capacity, it helped the researcher to disclose his own background relative to study. Gaining the trust of the experts was essential in gathering the rich data.

The interview data in this study were gathered from the setting of the expert's site. All the interviews were scheduled at the expert's offices in Bangkok and nearby provinces. In keeping with the ethics protocol, experts were given the signed copy of the letter provided to the researcher by his institution to conduct this study. On average, the researcher joined in three interviews per week, which in most cases were spaced one to two hours per expert.

Thai is the first language of 29 experts; however, they all were fluent in the English language. Charmaz 's (2006), emphasized that if the researcher attend to expert's language then the researcher can bridge the experience with her or his research or interview questions, and is particularly important when interviewing those from another culture and whose language is not of researcher's own.

The researcher is from other nationality but speak and understand the local language and with similar cultural background. Thailand has Buddhist cultural background and the researcher himself is from Buddhist cultural background. At the same time, researcher himself has been in Thailand for more than 14 years plus his work experiences in academic institution was very helpful in identifying the nuances and expression that particular meant.

The researcher began with broad open-ended questions that could help to introduce the research topic. The interviews discussed in detail and in-depth conversation. The researcher used the opportunity to explore rather than questioning all the time. The interviews considered as in-depth conversations and the researcher attempted to seek the expert's interpretation of their insights and experiences with respect to the contribution of Thai universities towards Thailand becoming a KBS.

The interviews took place over a one-hour period and some of the interviews took place over two or more hours. The great importance during the interview was the comfort level of the experts and their willingness to participate in a discussion and dialogue of disclosure. With the permission from the expert, the researcher recorded the conversation and details noted recorded immediately during and after the interviews.

Consistent with the methodology, the researcher opens the discussion following the lead of expert's views. Some of the expert's experiences lead to the topics and questions that are not always anticipated. For instance, three of the experts

at different times introduced the concept of KBS based on their university or organization experiences plus other activities. One of the experts shared his one slide presentation (Appendix H), how his organization supports the government policy towards Thailand becoming a KBS. These were not anticipated but one that provided to the researcher was a useful lead and pursuit that helped in addressing the research questions. There were similar examples that caused the researcher to change the line of questioning in favor of what experts would like to start with. One of the experts explained in details about Thailand education systems and its failure and success. The researcher posed the question during the interview from his research questions but allowed the experts freedom to take the conversation in the direction they desired. Wherever, the discussion and conversation diverted from the main topic, researcher endeavored to bring it back to the topic strategically.

The researcher interviewed the above three categories in three different stages. In the first stages, the researcher interviewed only the faculty members and Dean's level. In the second stages, interviewed were carried with decision makers, and third stages with the third international organizations. Following these stages helped the researcher in understanding the expert's notion towards the given question from bottom to top: operational level to the strategic level.

4.2.2 Quantitative Method

Under this method, the researcher identified the relevant variables or factors through a comprehensive literature review (chapter 3) as well as through the qualitative method and derived the conceptual framework (figure 3.1) and hypothesis for this research. At the same time, operational definition was carried out and clears out the unit of analysis for this study.

The researcher emphasized the selection of the target population and sample size for data collection through the chosen methods accordingly. In this case, the important decision is to identify suitable individuals in the organization to be approached for the survey. The literature review provided a pool of possible items/variables or factors in the study. The factors are then defined below and adjusted to fit the context of this study.

4.2.2.1 Target Population

To target the population of this study, the researcher collected following information presented in table 4.2 about the 9 research universities and targets its population (n) to the research accordingly. The figures are based on the academic year 2012. The target populations are categorized into two groups:

1) The first group consisted of local Thai University's Teaching members and research staff including professional schools such as medical, pharmaceutical and engineering.

2) The second groups were the students, who are currently enrolled. The focus was on doctoral students, however Master students were also considered especially who were taking the research thesis during the master courses. These respondents are enrolled in 9 research universities.

Table 4.2 Distribution of Target Population

#	Nine Research Universities	Teaching and Research Staff	Doctoral Students	Master Student	N
1.	Chang Mai University	2,167	1,413	8507	12,087
2.	Chulalonkorn University	2,861	2,510	10881	16,252
3.	Kasertsart University	2,754	1,917	9915	14,586
4.	Khon kaen University	1,946	2,433	7299	11,678
5.	King Mongkut University of Technology	737	725	5567	7,029
6.	Mahidol University	3,100	1,561	6583	11,244
7.	Princes of Songkla University	1,698	723	3084	5,505
8.	Suranaree University of Technology	370	566	1072	2,008
9.	Thammasat University	1,742	327	6516	8,585
	Total	**17,375**	**12,175**	**12,175**	**88,974**

4.2.2.2 Sampling Techniques

To obtain the numbers that could represent total population, researcher applied the Yamane formula (Yamane, 1967) to determine the sample size for this research. The purpose of sampling is to make generalizations about the whole population which are valid and which allow predictions to be made.

$n=N/1+N\,(e)^{2;}$ n=number of samples; N= number of total population, e=error, designated to be at the 0.05 significance level).

This formula helps in determining the minimum sample size that needs to investigate for any population size. The formula assumes a degree of variability (i.e. Proportion) of 0.05 and a confidence level of 95%.

Targeted populations (N) from the 9 research universities are having Teaching staff, Master and Doctoral students' number ranging minimum from 3,000 to a maximum of 10,000. Appling the Yamane formula, sample size for this study has been calculated accordingly as follows: n=88,974/1+ 88,974 (00.0025) = 445. From this calculation, it could be concluded that the total sample size for research is 445 respondents.

4.2.2.3 Unit of Analysis

Though the unit of analysis of this study could be at the organization level, however, the researcher used the unit of analysis at individual level. The reason behind using unit of analysis at the individual is that the study seeks the individual perception and understanding about contribution of their university's' towards the Thailand becoming a KBS. Therefore, this study specifies and focuses the unit of analysis at individual level.

4.2.2.4 Operational Definition and Measurement

In this research the term higher education institutions, territory education and universities is interchangeable and consider same meaning. The definition of the variables/factors and operational definitions of this study are given below. There is one dependent variable and eight independent variables. Among eight independent variables, two are the intermediatry variables and these two are the Academy Quality and ICT variables.

1) Dependent Variable

In this study, the researcher adopted the definition of Contribution of University towards Thailand becoming a knowledge society from Sharma et al (2008a) and United Nations (2005) and it is defined as 'Thai research university's ability to create, share and use knowledge for the sole purpose of improving upon the general wellbeing of the Thai people as well as making it possible for them to prosper and also universities enable people and information to develop without limits and open opportunities for all kinds of knowledge to be mass-produced and mass-utilized throughout the whole society'.

Operationalization

- Universities are able to create, share and use knowledge for the sole purpose of improving upon the general wellbeing of the Thai people
- Universities are making it possible for Thai people to prosper
- Universities enables people and information to develop without limits
- Universities provide open opportunities for all kinds of knowledge to be mass-produced and mass-utilized throughout the whole society

2) Independent Variables

Academy Quality in this study refers to fulfilling of minimum university's degree requirement and established stakeholder (employers) confidence as well effective transfer of the knowledge and values gained from universities.

Operationalization

- Academic quality of HEIs improve over period of time or improvement-driven approach (Santiago et al., 2008)
- University academic quality is systematic, structured and continuously improve and upgrade and also enhance its quality (Vroeijenstijn, 1995; Woodhouse, 1999)
- Safeguard the social interests in upholding the standards of University (Stamoulas, 2006).
- Universities are good enough to be approved (accreditation) (Woodhouse 1999).

- Universities products are good (Evaluation) and achieved its objectives and process effectively (Audit or review) (Woodhouse, 1999).

ICT in this study is defined as "processing and sharing of information using all kinds of electronic devices, an umbrella that includes all technologies for the manipulation and communication information" (Oye et al., 2012).

Operationalization

- Enhancing teaching and expanding learning opportunities
- Improving curricula and quality of educational achievements and for educational reform
- Enhance equity and inclusive education at University (targeting marginalized groups)
- Learners' employability and for diversity of life skills
- Integration in education with private partnerships (UNESCO, 2009)

Human Capital: is referred to an individual who gains the knowledge explicitly, implicitly, and tacitly from Thai research universities as well as the skill (academic, general and technical skills) and competency (capacity and capability). The measurement of the human capital has been carried out in various methods such as qualitative or quantitative or others e.g. cost-based, income-based and education-based. However, in this study, the measurement of the human capital is based on subjective approach and includes Knowledge, Skills, and Competency.

Operationalization

- Satisfaction of growth of human capital (UNDP, 2003)
- Human capital serves economic development of the country (UNDP, 2003)
- Human capital produce from universities generate major sources of development of the country
- Knowledge acquisition is sufficient (UNDP, 2003)
- Right to knowledge in society (UNDP, 2003)
- Improvement in the field over last ten years
- HEIs emphasis and focus on knowledge carriers
- HEIs transmit the systematic knowledge that can shared

- Complex knowledge
- Close interaction and transmission of knowledge between teacher and learner through guided instruction (Collins, 2010)
- HEIs disseminate knowledge to public through documents, research articles, thesis and research
- The acquisition of knowledge takes place largely independently at HEIs (Reber, 1993)
- Knowledge sharing through conscious perception and representations by action of intrinsically unconscious mechanism (Perruchet et al., 1997).
- Higher reliance on prior learning, relative to current learning, the greater use of tacit knowledge gained from universities by the individual
- Knowledge and experiences are shared through joint activities: Socialization (Nonaka & Takeuchi, 1995)
- Knowledge unstructured and crystallized through a process of reflection between sharing individual (Nonaka & Takeuchi, 1995)
- Dissemination of knowledge accomplished through knowledge carriers from one to another.
- Skill is very real human capital challenge for HEIs (Silva, 2009)
- High skill knowledge has the potential to raise to local human capital (Abel and Dietz, 2011)
- Higher skills significantly influence life opportunity and earning potential and draw mature individual toward knowledge society.
- HEIs encourage to learn and develop the research skill
- HEIs develop the measurement of academic skills
- Skilled required not only gain employment but also enhance the career within the organization (ACCI & BCA, 2002).
- Self-Management skills (Bridgstock, 2009)
- Generic skill development is an adequate for the country development

- Ability to deal with multiple issues and details (Sanghai, 2007)
- Abilities to continuously recognize and capitalized on employments and training (Bridgstock, 2009)
- Ability to use analytical skills (Sanghai, 2007)
- Ability to communicate knowledge to society (Sanghai, 2007)
- Anticipating problem inventing ideas (Sanghai, 2007)
- Ability to assess the knowledge gap (Sanghai, 2007)
- HEIs produces highly imaginative and innovative ideas and proposals (Sanghai, 2007)
- Ability to perform and achieve as well demonstrate the capabilities that gained from HEIs
- Making sound decision and take effective action (Passow, 2008).
- Effective performance in a variety unique, complex and uncertain situation (Passow, 2008)
- Plan, implement, and improve the knowledge gain from universities
- Absorb internal and external knowledge
- Recognize, value and acquire external and internal knowledge
- Transform and implement the knowledge within the nation to grow
- Apply new knowledge commercially to achieve organizational objectives
- Learning through the grafting of cognitive orientation to managerial and technical matters
- Well-developed abilities could contribute, articulate and communicate the knowledge to society (Minbaeva and Michailova, 2004)
- Knowledge transfer contributes to the national goal (Guzman and Wilson, 2005)

- Willingness to learn knowledge that can be enhanced by the employment of long-term (Minbaeva and Michailova, 2004)

Culture: in this study researcher adopted the definition of culture by Leininger (1995) and it refers "to learn, shared and transmitted values, beliefs, norms and life ways of special individual or group that guide their thinking, decisions, actions, and patterned ways of living**".**

Operationalization

- The university creates an environment where knowledge workers can develop the ethical commands parity of esteem with mental development (Reeves, 1988; Arthur, 2005).
- The university is a platform to learn the values of different culture, belief, norms
- The university provides a rich learning experience to their students and scholarly atmosphere where they contribute and implement the ideas for the country development.
- University aim of education is to develop each individual as full as possible, to make man more human

Research: in this study research is defined as 'process of systematically collecting information either qualitative or quantities for the purpose of testing an existing theory or generating a new one**'** (Kendall, 2011).

Operationalization

- Use local business to develop and commercialized products that result from universities research activities
- Research through universities creates the opportunity not only for individuals but also for industry, country and to the region,
- Research activities are generally an integral part of the knowledge production process and it generates new knowledge areas (Shapira et al., 2006).
- Research and development through university has positively related to the economic and knowledge development of the countries
- Investment in the research and development creates new products and new intellectual property

Governance: To define the meaning of Governance in this study, the researcher used the definition of Shattock (2006) and it refers to "Constitutional forms and processes through which universities govern their affairs". In this study, governance concerns with accountability and transparency. Accountability in this study means, universities are obliged to provide information about the academic offerings and decisions, actions and to justify them to the public or to the society (answerability) at the same time sanction the remedy for the contravening behavior (enforcement)' (Dunn, 2003; Burke, 2004). Transparency mean Thai universities to be visible, legible and sharing the information with openness to its stakeholders and to the society.

Operationalization

- Governance is given equal weight as of core business of university (teaching and research) (Shattock, 2006)
- Universities has the textual guideline on governance that all persons work smoothly (Tapper, 2007)
- The changes in governance allow external and internal stakeholders to participate in decision-making or deliberation over important internal matters (Rheee, 2010).
- Faculty and Student have voice in the university governance structures (Oba, 2010).
- Shared governance is effective process through which HEI may achieve its mission (Birnbaum, 2004)
- HEIs able to demonstrate the "value for money or of responsible and relevant activities undertaken with the tax payer's money" (Santiago et al., 2008).
- HEIs regularly assess and evaluate the quality of its program and services (Burke, 2004)
- HEIs identify the public need and responded accordingly (ibid)
- Transparency of administrative activity is an important aspect as well driving principles in managing the HEIs.
- University has systemic information to monitor

- Transparency is necessary condition for exercising control
- Transparency led to enhance the HEIs contribution towards society
- University has its own strategic planning for the development

Innovation: In this study, innovation means 'Thai universities openness and interaction with external partners and the ability to produce innovative products and services'.

The innovocation cocerns with the technological innovation, teaching innovation and Program innovation. Technology innovation means bringing out new ideas, products, process and services to market deployment. Teaching innovation means increase the engagement and effectiveness of lesson and also enable to exploit the traditional concept of teaching. Program innovation means providing innovative undergraduate and graduate degree program.

Operationlization

- Universities play platform for the innovation with support from the industry (Chapman, 2006).
- Innovation helps universities to generate income for universities
- Unwillingness to change attitude and practice obstacle for innovation (Gammon, 2006)
- HEIs encourage to be innovative and offer infrastructure for innovation
- Openness to external environment improves HEIs ability to innovate (Laursen & Salter, 2006)
- HEIs encourage for the patenting the product and services (Laursen & Salter, 2006)
- HEIs decision makers plan and strategies for technology innovation
- Freedom to be creative at HIEs generate technology innovation through partnering with industry

- Teaming with industry overcome the technological innovation
- HIEs process and structure influence to adoption of and diffusion of technological innovation (Workman, 2010)
- HEIs technology innovation leads to entrepreneurial success and pitfalls
- HEIs education readies individuals for the world to be practical and effective
- HEIs show how realities can be changes to create new values
- Education s inspirational and Creative teaching and presenting technique
- Benefited from the program offering
- Curriculum innovation in the degree program is crucial for educators to adapt and develop expert teaching and learning activities (Wall and Ryan, 2010)
- Innovative degree program for the needs of knowledge workers
- Innovative professional degree for the knowledge workers

Infrastructure: in this study, infrastructure refers to 'core physical structure consisting of academic and accommodation building; ICT: hardware and software; leisure facilities; established internal information system and the office equipments and stationeries'. Operational Infrastructure means provision of physical facilities to run the campus effectively and efficiently. Scientific Infrastructure means tools and instrument to provide essential services to the researcher for basic and applied research.

Operationalization

- University facilities support faculty and students and staff to carry out their task assignment.
- Good physical presence of universities' infrastructure shows the important aspects of institutional culture

- University infrastructure facilities are accessible to the handicaps students
- Availability of computers, local area network, Internet
- Connections, electronic Whiteboards and other facilities
- Availability of software general and subject specific software, learning management systems, assessment tools, etc.
- Infrastructure needs and issue
- The university ensures adequate access to research instrument
- Funding for the research instrument
- Upgrade and maintenance the research instrument/lab and the facilities
- Availability of digital library, research database

4.2.2.5 Survey Instrument or Measurement

The measurement of intangible aspects of the constructs of this study is based on the measurement of understanding of respondents through the mentioned methods as identified in the methodology diagram.

A survey instrument is designed to prove the existence of the study's hypotheses in this study. The study used the measurement scale level of 1 to 10, 1 representing strongly disagree and 10 representing strongly agree. This scale better enables the respondent to understand the contribution of universities toward Thailand becoming a KBS. Total of 133 items was designed and is based on the empirical studies of various scholars found in the literature review. Questionnaires (Annex 7) for this study include 9 variables and these are shown in table 4.3.

Table 4.3 Variables and Items

#	Factors	Variable Focus	Total Item	Scale
1.	Contribution of University Towards Thailand Becoming KBS	focused on the respondents' understanding on contribution of the university toward knowledge society	7 items (q1 to q7).	1-10
2.	Human Capital	focused on the respondent understanding of the university's contribution of human capital for Thailand	50 items (q8 to q58)	1-10
3.	Governance	focused on the respondent's understanding of their universities governance	14 items (q59 to q73).	1-10
4.	Academic Quality	focused on the respondents understanding their university's academic quality towards KBS	8 items (q74 to q81).	1-10
5.	Culture	focused on the respondent's understanding of their university culture	7 items (q82 to q88).	1-10
6.	Research	focused on the respondents understanding of their university' research productivities and its contributions towards KBS	5 items (q89 to q93).	1-10
7.	Innovation	Focused on the respondents understanding of innovation in their universities and its contribution toward KBS.	22 items (q94 to q115).	1-10
8.	Infrastructure	focused on respondents' understanding of their university infrastructure and its impact on their operational activities	11 items (q116 to q126).	1-10
9.	Information and Communication Technology	focused on respondents understanding the ICT facilities of their universities	7 items. (q127 to q133).	1-10

4.2.2.6 Experts Opinion on the Survey Questionnaires

To collect structured information and opinion, researcher seeks 10 expert opinion on closed ended question. In this study experts mean officers or higher position holders who have intense experience in understanding the issues of higher education and the concept of knowledge society or having experiences in this field of areas. These experts are working and deeply involved in academic institutions. Some of these experts are faculty members of the university and some of them are decision maker and senior support staff of university or academic institutions.

The collection of expert opinion ensured the complete and correct construct of items that are included in the primary data collection through the questionnaire survey and lead to the improvement of content validity and the reliability of the item, which essentially ensures that the measurement instrument targets the intended constructs. Questionnaire is also translated in Thai language and seeks the language experts to review the translated questionnaires and later on it was translated back to English with the help of other experts. This is to make sure that the content and meaning of the questionnaire should remain same.

4.2.2.7 Pre-test

To validate items further, pre-tests was conducted to identify any potential problem in the measurement due to the clarity, the wording, and the format of the questionnaire. This was carried in the month of February 2013. The target pre-test groups were Thai doctoral students at the Asian Institute of Technology (AIT). AIT is one of the well-known academic institutions in Asia based in Thailand. Thirty two (32) respondents have responded the pre-test questionnaires. These respondents' doctoral students at AIT are the faculty members of Thai universities. After analyzing the pre-test, all the 133 items were valid and reliable for the full fledge data collection.

4.2.2.8 Validity Test of the Pre-test and the Collected Final Data.

The researcher carried out the validity and reliability test for the collected data from the pre-test. The validity test carried out by applying the factor analysis. This was conducted to identify any potential problem in the measurement due to the clarity, the wording, and the format of the questionnaire. Factor analysis has lot of different purposes used by researchers especially when evaluate the tests or

scales that measure particular knowledge area and particularly construct. The factor analysis ensures the construct validity. Factor analysis is data reduction techniques, it takes a large potential set of items that can be reduced and can be summarized as using a smaller set of data and components. It reduces the items into a groups or clumps that have very strong inter-correlations in the set of items. When there are a large number of items, this technique finds inter-correlations of the items and the pattern mathematically. This technique reduce large number of data items related to a more manageable and efficient number of items to measure the construct and not to have the redundancy in the items.

Factor analysis identify numbers of components that could satisfactorily explain the observed correlation among the studied variables. Thus, it is important to identify whether a small number of components could account for a significant portion of the co-variation among a much larger number of variables. Factor analysis, using the Principal Component Analysis (PCA) is statistical techniques whose purpose usually consists of data reduction and summarization. This method helps in redistributing the variance to make a factor loading more clearly between loaded components and explanation easier. The researcher used SPSS version 21 to analysis the statistical data. The factor loading of the pre-test surveyed items were from 0.558 to .998.

From the full fledge collected data and after screening the items, there were total of 107 items for further analysis. The researcher used the factor analysis to refine and reduce these items into a smaller number of sub scales that measure the construct. The researcher further carried out the Exploratory Factory Analysis (EFA) to identify the relationship among the items. The researcher carried out the steps of the EFA. These are as follows:

To begin, with, it is important to test the values of the overall Kaiser-Meyer Olkin (KMO) statistic of all the items, which should be above 0.50 as specified by Kaiser (1974) and the Bartlet Test of Sphercity as insisted by Kinnear and Gray (1994). The Bartlett's tests of Sphericity result shows that all the 107 items from all the respondent groups were significant ($p = 0.000$) and KMO results is 0.976. Hence, both statistics allows and reassure researcher and confidently proceed with factor analysis for this index. The researcher checked the iterate until arrive at a clean

rotated component matrix and also the adequacy, which is the KMO and Bartlett's tests of Sphericity result.

The goodness of fitness results show not significant it is because of huge data set 408 responses and is not going to get the significant. The overall it is having of .5% non-redundancy residuals, which is less than 5 percent and is good enough for data analysis.

The researcher further apply the Principal Factor Analysis (PFA) and used the Eigenvalues greater than 1 (SPSS extracted the number of the components) to extract the factor components. The loaded components are sorted by size and suppress small coefficient absolute value below 0.5. Study applied the orthogonal varimax rotated method in order to variables with high loading on the same component to be placed together where factor loading higher than 0.5 in absolute terms are included. Thus, study, excluded the items loaded with less than 0.5 because it contain less that of the variance. This shows loaded items are having a high enough convergent validity and Discriminant validity is also checked. This mean that there is no cross loading in the rotated component matrix.

In addition, the Varimax to rotate the initial factor solution to validate the items of the components. Total explained variance is 77.26%, which is above 60% and is good enough to further analyses.

Among the 107 items (1-10 scale), only 79 items are loaded with above 0.5 variance and generated nine (9) factor components. The factor loading of the items in these components are ranged from 0.520 to 0.953. The detail factor loading in each components are shown in the table 4.4 below together with descriptive statistics. Based on the factor loading on each component, the researcher labeled the name each factor component and is presented herewith:

1) Component 1: it shows the respondent's perception and understanding as well as the importance of the governance. Thus, the researcher has labelled this component 1 as 'Governance'. Nine (9) items loaded in this component.

2) Component 2: it represents the respondent's perception and understanding and also the importance of the 'Culture'. Hence, the study labeled this component 2 as 'Culture'. Total of seven (7) items loaded in this section.

3) Component 3: it represents the respondent's perception, understanding and the importance of the academic quality. Therefore, the researcher labeled this component as a 'Academic Quality'. In this component, total of six (6) items were loaded.

4) Component 4: under this component, it represent that the respondent's perception and understanding and the importance on the Contribution of University towards to Thailand becoming KBS. This component is also the dependent variable. Thus, the researcher labeled this component as a 'Contribution' of University towards Thailand becoming KBS. Eight (8) items were loaded in this component.

5) Component 5: In this component, total of 12 items were loaded and the researcher labeled this component as an 'Innovation'. These 12 items related to the innovation variable and respondent's perception is matched.

6) Component 6: It represents the respondent's perception and understanding as well as the importance of human capital. Thus, the researcher labeled this component as a "Human Capital". Total of twenty three (23) items were loaded in this component.

7) Component 7: The data shows that there are total of eight (8) items were loaded in this component. These items are related to the Information and Communication Technology (ICT) and researcher labeled this component as 'ICT'.

8) Component 8: Respondent's perception and understanding of this component is related to the research. Thus the researcher labeled this component as a "Research' and there two total of three items were loaded.

9) Component 9: the last component has total of three items and it is related to the infrastructure. The researcher labeled this item as an 'Infrastructure'.

Table 4.4 Varimax Rotated Factor Matrix and Descriptive Statistics of 9 Variables (n=408)

#	Items	Varimax Solution	$\bar{x}$	S.D
	Component 1: Governance (GOV)			
1.	University regularly assesses and evaluates the quality of its program and services.	.953	7.80	1.82
2.	University is able to demonstrate responsible and relevant expenditures when using taxpayer's money.	.947	7.73	1.84
3.	University identifies the public needs and responds accordingly.	.832	7.47	1.86
4.	University implements shared governance as an effective governing process.	.820	7.07	1.99
5.	University its own strategic plan for development	.809	8.01	1.76
6.	Transparency leads to enhance the university's contributions to society.	.788	8.10	1.83
7.	In university, the changes in governance allow external and internal stakeholders to participate in decision-making or deliberations over important internal matters.	.761	7.07	1.95
8.	University has the written guidelines on governance to ensure that all persons work in a mutual cooperation.	.759	7.12	1.90
9.	Transparency is necessary condition for exercising control the university.	.696	8.01	1.94
	Component 2: Culture (CUL)			
1.	University's aim of education is to develop individuals' full potential.	.759	7.86	1.76
2.	University provides rich learning experience for its students.	.745	7.89	1.72
3.	University creates an environment where knowledge workers can develop the ethical commands with parity to mental development.	.733	7.91	1.71
4.	University provides platform to learn the values of different culture.	.695	7.90	1.74

Table 4.4 (Continued)

#	Items	Varimax Solution	$\bar{x}$	S.D
	Component 2: Culture (CUL)			
5.	University provides platform to learn the values of different belief	.688	7.73	1.75
6.	University provides a scholarly atmosphere where scholars contribute and implement the ideas for the country's development.	.687	7.76	1.76
7.	University provides platform to learn the values of different norms	.663	7.77	1.83
	Component 3: Academic Quality (ACQ)			
1.	University believes in safeguarding the social interests in upholding the standards of university.	.659	8.04	1.78
2.	University's academic quality is systematic and structured	.628	7.86	1.85
3.	University's academic quality is continually improving.	.625	7.96	1.83
4.	University meets the standard to approve as a research university.	.548	8.33	1.75
5.	University has achieved its objectives and process effectively.	.529	8.04	1.76
6.	The academic quality of university improves over a period.	.528	7.92	1.86
	Component 4: Contribution of University toward Thailand becoming KBS (CON)			
1.	University enables information creation	.945	7.98	1.58
2.	University helps Thai people prosper in their life: Enhance quality of life	.924	8.00	1.77
3.	Human capital produced by university contributes the economic development of the country	.893	7.83	1.72
4.	University provides opportunities for all kinds of knowledge to be mass-produced and utilized throughout the whole society	.764	8.03	1.81
5.	Satisfied with of creation of human capital through education provided by the university	.704	7.73	1.79

Table 4.4 (Continued)

#	Items	Varimax Solution	$\bar{x}$	S.D
6.	University provides equal opportunities to gain knowledge to broader society	.657	8.01	1.66
7.	University emphasizes and focuses on knowledge creation	.655	8.12	1.70
8.	Knowledge gained from university aims to fulfil sufficient for societal needs	.508	7.75	1.71
	Component 5: Innovation (INN)			
1.	Freedom to be creative at my university generates technology innovation through collaborating with industry.	.852	7.85	1.82
2.	University decision makers plan and strategize for technology innovations	.825	7.33	1.86
3.	University allows teaming with industry for the technological innovations	.815	8.00	1.72
4.	University process and structure influence the adoption of and diffusion of technological innovations.	.756	7.42	1.80
5.	At university technological innovations lead to entrepreneurial success	.744	7.52	1.90
6.	University needs innovative degree program to fulfil the needs of knowledge workers.	.727	7.95	1.69
7.	University offers infrastructure for innovation	.715	7.70	1.88
8.	Innovation helps my university to generate income for the university.	.714	7.47	1.99
9.	University provides a platform for innovation with support from government	.711	7.66	1.90
10.	University provides a platform for innovation with support from industry.	.704	7.52	1.94
11.	University encourages innovation.	.695	8.00	1.80
12.	University professional degrees are innovative and design for knowledge workers.	.647	7.83	1.73

Table 4.4 (Continued)

#	Items	Varimax Solution	$\bar{x}$	S.D
	Component 6: Human Capital (HUC)			
1.	Can transfer the knowledge towards the achievement of national goals.	.995	7.87	1.62
2.	Well-developed abilities could communicate knowledge to the society	.965	8.10	1.49
3.	Well-developed abilities could contribute knowledge to the society	.900	8.16	1.46
4.	Able to transform knowledge for the benefit of society	.825	8.19	1.40
5.	Able to Implement skills and knowledge.	.803	8.32	1.38
6.	university knowledge is unstructured and crystallized through a process of reflection between sharing individual	.829	7.17	1.90
7.	University education enhances the greater use of tacit knowledge	.787	7.71	1.68
8.	Able to improve upon the knowledge gained from my university	.767	8.18	1.52
9.	Able to apply new knowledge to gain organizational commercial objectives.	.744	7.85	1.63
10.	Able to implement the knowledge gained from my university.	.719	8.09	1.55
11.	University the dissemination of knowledge is accomplished through knowledge carriers	.678	7.61	1.66
12.	At university people acquire the ability to deal with multiple issues and details	.677	7.58	1.64
13.	At university, experiences are shared through joint activities between teacher and learner.	.660	7.64	1.68
14.	At university knowledge sharing is through conscious perception	.647	7.78	1.65

Table 4.4 (Continued)

#	Items	Varimax Solution	$\bar{x}$	S.D
	Component 6: Human Capital (HUC)			
15.	At university, able to assess the knowledge gap in one's area of study	.576	7.84	1.54
16.	University people learn self-management skills.	.584	7.69	1.71
17.	University measures the develop the level of academic skills through development of measurement tools	.565	7.78	1.76
18.	At university people are enabled to continually recognize and capitalize on employments and training opportunities	.551	7.69	1.76
19.	University teaches the ability to use analytical skills	.543	7.92	1.72
20.	University is able to meet the challenge of attaining skill development in human capital.	.538	7.80	1.61
21.	At university generic skill development is adequate for development needs	.529	7.38	1.63
22.	Able to anticipate problems and invent ideas.	.527	7.97	1.53
23.	University encourages close interaction and transmission of knowledge between teacher and learner	.520	7.80	1.75
	Component 7: Information and Communication Technology (ICT)			
1.	ICT enhances learners employability and for the diversity of life skills	.951	7.79	1.80
2.	ICT levels promote equity and inclusive education at university	.936	7.79	1.84
3.	ICT helps university in improving its curriculum	.881	7.83	1.84
4.	ICT helps improve the quality of educational achievements and reforms.	.876	7.93	1.68
5.	ICT integrate education with private partnerships.	.869	7.43	1.89
6.	ICT facilities at university enhance the teaching and expands learning opportunities.	.732	7.84	1.92

Table 4.4 (Continued)

#	Items	Varimax Solution	$\bar{x}$	S.D
	Component 7: Information and Communication Technology (ICT)			
7.	University has software – both general and subject specific: learning management systems, assessment tools, etc.	.712	8.10	1.83
8.	University ensures adequate availability and access to research instruments and lab.	.544	7.62	1.98
	Component 8: Research (RSH)			
1.	University research activities help local business to develop products and services.	.768	7.52	1.76
2.	Research and development through university is positively related to the economic and knowledge development of the country.	.638	7.93	1.66
3.	Research through university creates the opportunity not only for individuals but also for industry, region and country.	.591	7.66	1.70
	Component 9: Infrastructure (INF)			
1.	University good physical infrastructure presents the aesthetic social and culture aspects of institutional culture.	.756	7.84	1.84
2.	University facilities support its community: faculty, students and staff, to help carry them their given task / assignment	.605	7.83	1.79
3.	University infrastructure facilities are accessible to the physically challenged students	.561	7.52	2.00

4.2.2.9 Reliability Test of the Pre-test Data and the Collected Final Data.

The statistical tools Cronbach's Alpha was used to analyse and reliability of the items for the measurement. If variables achieve an alpha score of more than 0.6, it indicates that the variables are reliable. The overall Cronbach's

Alpha for the pre-test of the 135 items was .990 and the alpha ranged from .998 to .990. The researcher further carried out the full fledge data collection with minor changes in English language in the questionnaires.

The reliability test of full-fledged data is to identify the measurement in terms of equivalence and internal consistencies. The reliability test and the total Cronbach's Alpha of valid 79 items is loaded with .994, which shows that all the items are reliable to carry out further analysis. Table 4.5 shows the results of reliability of the 9 components of this study. These components are also called as variable in this study.

Table 4.5 Reliability Coefficients of 9 Components/Variables

#	Variables	Number of items	Cronbach's Alpha	Items Cronbach's Alpha Range
1.	GOV	09	0.947	.938 - .945
2.	CUL	07	0.969	.962 - .966
3.	ACQ	06	0.971	.961 - .969
4.	CON	08	0.940	.928 - .932
5.	INN	12	0.967	.962 - .968
6.	HUC	23	0.927	.970 - .927
7.	ICT	08	0.961	.952 - .960
8.	RSH	03	0.914	.855 - .898
9.	INF	03	0.910	.809 - .902

The results of the reliability on the 9 variables presented in the above table confirmed that all the variables used in this study have very high liability of coefficients with Cronbach's Alpha values ranged from 0.910 to .971.

4.3 Data Collection

Questionnaires was designed for the target sample groups to collect respondent's opinions and information about contribution of Thai Research

Universities towards Thailand to becoming a KBS. The researcher contacts each decision maker of the universities directly to explain the purpose and the role of experts in this survey. Each expert was briefed about the study. Then, they were informed about the questionnaires, which researcher used the online questionnaires.

Questionnaires were asked closed-ended questions (Appendix I). The perceptual measures of the dependent and independent factors are based 'Likert' style questionnaire with the respondents agreeing to a statement assessed on a scale from 1 (strongly disagree) to 10 (Strongly agree).

Data collection for this study was based on primary and secondary data, which is explained in detail below.

4.3.1 Primary Data

The primary source data was necessary for this research and information were collected from the people involved through a set of questionnaires online and interview methods. The pilot study, reports and media reports were used to obtain additional data, especially statistical information.

The primary data were collected from three sample groups: Policy maker, University's President, Vice Presidents and also the lecturer, and the students: doctoral and master students. These primary data were collected from 15 March 2013 to 30 June 2013. The convenient sampling technique was used for these two groups.

The data were collected from the using the online survey. The researcher used the open source (limesuvey tools) software. This software is highly recommended by academician and among the top 12 software programs including paid software used online by the researchers and academicians. This software is freely available and also reliable to carry out the online survey. Not to have double respondents from the same computer/respondent, this software also save the IP address of the respondent and also the time duration of the time spend on the completing the requested survey. Most of the western universities, especially in United States recommended this software to their students especially for research students: master and doctoral program.

Before sending online research questionnaires, the researcher collected the email addresses of the faculty members available publically on nine research universities' websites. The researcher has compiled more than 2,915 email addresses

and created a mailing list to send the online questionnaires. Before sending the online questionnaires, the researcher requested and sought permission from the decision makers of the concern universities and sends the online questionnaires to the created mailing list. The researcher sent three email to those listed faculty members and then followed to each universities. The researcher also used social media such as Facebook, to disseminate the online questionnaire to the faculty members, doctoral and master students in those 9 research universities.

The online questionnaires were in two languages: English and Thai. Total of 650 respondents completed the online survey. This number is above the require sample size applying the Yamane formula. After screening the data, 426 respondents have completed the survey and remaining respondents have not completed the online survey.

4.3.2 Secondary Data

The information regarding the background of the problems, the government policies and regulations, state laws, significant events, and other pivotal data were conducted in textual analysis style. Therefore, textbooks, articles, government documents, and information from websites were the main sources of secondary data. Some of the related information was used to develop questionnaires that administered to willing the respondents.

4.4 Data Analysis

Data analysis was based on two parts and these were qualitative data analysis and quantitative data analysis. Before analyzing the data, the researcher carried out the screening both the data: qualitative and quantitative.

4.4.1 Analysis of Qualitative Data

The qualitative data consists of the word or text from an interview or written text or reports and the observations, therefore, it needs to be an analysis and interpretation of the data needs to be done accordingly. Thus, it requires a systematic approach and the creativity in analyzing the data. There is no any specific or single

method of analysis the qualitative data but various types depending upon the researcher observation (Ary et al., 2010; Denscombe, 2010).

Locating the factors in this study carries out analysis of qualitative study. The factors are located by observing the commonality of the data and make the interpretation. This aims was to legitimate careful quality research (Glaser and Stauss, 1967). Following the four steps were carried out to analysis the qualitative data for this study.

1) The first step of analyzing the qualitative data, the researcher scrutinized and organized all the collected information and data either through an interview by questionings and the reports of universities, research articles and the texts from the media including newspapers.

2) In the second step, the researcher focused on the factors, where how the individual respondents responded to each question that was asked during the interview. Data is organized in order to identify the consistencies and differences and explore the connections and relationship between the given questions.

3) In the third step, the researcher categorized the information into factors and organized them and brings the meaning out of the text. In addition, the researcher also categorized the data into sub-factor also depending on the extracted information from the data. Once it was done, the researcher put those factors in a pattern and connection within and between the categorized information.

4) In the last step, the researcher interprets the data and list out the key findings that discovered as a result of categorizing and sorting the collected data.

4.4.2 Analysis of Quantitative Data

To analysis the data, there was need of clear theatrical model with the clearly hypothesis to represent the research model. In this study, the researcher developed the theoretical model or conceptual framework (see chapter 3 page 89) based on the literature review and develop the hypothesis (see chapter 3 page 90). To test this theoretical model, the researcher collected data applying the convenient sampling technique. This data was collected using online open software. The researcher used SPSS 21 version to analysis the data.

There were total of 650 respondents, who filled up the survey. Among them 426 respondents completed the survey. Following the Yamane formula, this completed respondents' data was enough to process further to analysis the data. Before analysis data, the researcher followed following procedure to screens the data.

4.4.2.1 Case Screening (Respondents)

Under this procedure, the researcher followed three steps to screening the cases. These three steps were finding out the missing data in the cases, unengaged response and the outliers.

1) Missing data: the researcher followed the first step to find out any missing data from the single respondent. From the 426 respondents, there was no any missing data.

2) Unengaged responses: In the second step, researcher screens the unengaged response. It was concern with the respondents responded to the items with exact same value to the every single question (items). To screen unengaged responses, the researcher used Standard Deviation to identify any unengaged responses to the all the items. If the overall standard deviation of the individual respondents to the items is less than 0.5, those cases are not useful for the study because there are no any variances in their responses. The researcher carried out the visual inspection and found total of 16 respondents or cases was clearly unengaged and removed. Thus, 408 cases (respondents) were the total valid engaged responses and usable for the further data analysis

3) Outliers: since the scales for these items are from 1 – 10 scale level, there was no any outlier for the items. However, when screening the data, majority of respondents select the scale range from 5 to 10. There were few respondents who marked their perception scale from 1 to 5, which were deleted because it could affect the overall data. In addition, at the age item, there are few respondents were shows as outlier, which shows that some of the respondents were age of 60 and above year old. However, this cannot be considered abnormal or enormous data because the respondents were from the faculty members with highly experience and knowledgeable. Responses from these respondents on the items would be highly effective in understanding the Universities contribution toward Thailand becoming KBS.

Thus, after screening the case, out of 650 cases, 408 cases were the correct and valid cases to carry out further analysis.

4.4.2.2 Variables or Items Screening

After the case screening, the researcher further carried out the items screening. In this, the researcher identifies any missing data in items, if there was any missing data in the items, median value to be used in the whole given items. However, after screening the items, no missing data in the items were found.

The researcher further carried out kurtosis and the standard deviation simultaneously. The researcher used the kurtosis and Standard Deviation value anything value ± 2 to run the items. Among 135 items, values of 19 items (kurtosis) and 9 items (standard Deviation) were slightly higher, which mean there wasn't lot of variance on these items, because respondents responded similar responses to those items. If there is any strong negative value, it means that the respondents responded the items differently and there wasn't central tendency towards the median. These 28 items are positively loaded. At this stage, nothing was done on these 28 items but researcher took a note that these items and observe during the factor analysis, if these items cause any problem during the analysis, for example these items might have low communalities and might load any single loading factor. These 28 items are from the different factors and loaded high, therefore, researcher kept the items in the factors. During the analysis the data, it was observed that there was irregularities in the correlation and in the regression analysis. For instance, some of the correlation between the variable were high and it was loaded above 0.8, and R square (r^2) was very high. After deleting these 28 items, correlation and regression analysis gave better result (see Table 6.2). Thus, study removed the above 28 items to solidifying the results.

The researcher further test the normal distribution of each individual variable with the Kolmogrov-Smirnov and Shapiro- Wilk statistics are significant at 0.001 levels. The researcher also run the Normal Q-Q and boxplot for all the variables shows the normal distribution of the variables. In addition, all of the remaining individual items (107) are normal because the Kolmogrov-Smirnov statistics ranged from 0.125 to .219 and Shapiro-Wilk statistics ranged from .845 to .944. The researcher also carried out the Normal Q-Q Plot, which shows the observed value

against the known distribution. The results of each items plots show that observations distributed closely around the straight line, which shows that the distribution is normal.

4.4.2.3 Path Analysis

To carry out the hypothesis testing, the researcher applied path analysis to find out the casual effect: direct and indirect impact of independent variables on the dependent variables. Path analysis is an extension of multiple regressions that allows the researcher to examine, or determine the relationship among the variables.

Path analysis aim is to provide estimates of the scale and significance of hypothesized causal connections between sets of variables and it is best explain by considering a path diagram. Considering the literature review, possible different paths identified that shows theoretically strong relationship towards explaining the contribution of universities as a whole. These possible avenues are depicts in the following input path diagram

Input path diagram consist of eight dependant variables such as Human Capital (HUC); Governance (GOV); Culture (CUL); Research (RSH); Innovation (INN); Infrastructure (INF); Academic Quality (ACQ) and Information and Communication Technology (ICT). The main dependent variable in the research was the Contribution of University toward Thailand becoming KBS (CON). Other than the main dependent variable ACQ and ICT are considered as dependent variables in the second stage. Equalition for the relvant variables as follows.

$$CON = \beta_1 HUC + \beta_2 GOV + \beta_3 CUL + \beta_4 RSH + \beta_5 INN + \beta_6 INF + \beta_7 ACQ + \beta_8 ICT \quad (1)$$

$$ACQ = \beta_{21} HUC + \beta_{22} GOV + \beta_{23} CUL + \beta_{24} RSH + \beta_{35} INN + \beta_{26} INF + \beta_{27} ICT \quad (2)$$

$$ICT = \beta_{31} HUC + \beta_{32} GOV + \beta_{33} CUL + \beta_{34} RSH + \beta_{35} INN + \beta_{36} INF + \beta_{37} ACQ \quad (3)$$

4.5 Summary

Study applied mixed method approach. It was apply mainly to support the qualitative method by quantitative method. The target group of the qualitative was the decision and policy makers of universities and government official. Total of 31 were interviewed. The target groups of the quantitative approach were the faculty, research staff and students: doctoral and master. Total of 650 completed the survey. The next two chapters present the finding of qualitative and quantitative data. In this study, quantitative data is to supplement the qualitative data and findings.

CHAPTER 5

FINDING AND DISCUSSIONS OF QUALITATIVE DATA

This chapter addresses the two research objectives of this study. In this context, the qualitative data was collected from the decision makers from 9 Thai research universities as well as from the decision makers of government agencies and informants related to the field of higher education sector. The researcher interviewed 31 experts (Appendix G) to seek their understanding regarding KBS from Thailand perspective and the contribution of universities towards KBS.

Interviews were undertaken using open-ended questions. Interviews with key policy makers and decision makers were conducted to investigate and understand their perspective on the contribution of 9 research universities toward Thailand becoming KBS. These high-ranking officials are experts in their fields and prominent authorities in this area so they were able to provide insight into the nature of the university's contribution and the nature of relationships among the various departments involved in Thailand becoming a KBS.

The researcher grouped the expert in three categories (see table 4.2) and all were asked same questions (Appendix F) about their understanding about the concept of KBS in the context of Thailand. The statements and discussion in chapter are comprised of the thoughts expressed by the experts to the writer are indented are conceded with the following elements:

1) The immediate quotation of the interviewees;

2) Summarization of the statements and idea expressed by the experts during interview;

3) Experts thoughts and believes expressed during the interview are summarized as a whole.

With the consistent research questions, the theme arising from the data was categorized mainly under two heading: 1) the concept and charecteristics of KBS in the context of Thailand and Contribution of University towards Thailand becoming

KBS and 2) role of universities toward Thailand becoming a KBS. The researcher has critically analyzed the data and statement in concrete and textual format.

5.1 The Concept and Characteristics of Knowledge Based Society in the Context of Thailand (Research Objective 1, Chapter 1)

This study found that the majority of the experts agreed that the Thai research universities have been producing knowledge workers (either it is technical oriented or non-technical oriented knowledge workers) to Thai society. These knowledge workers contribute their gained knowledge from the universities for their individual career growth as well as to the societal development in different level of organization: either community level or government organization or non-government organization or private or public sectors.

Involvement in these different parts of the societies, knowledge workers contributes for the "national development and national innovation and its production system for the betterment of the society" (Appendix G: 1-8). These knowledge workers are the core knowledgeable resources for the country development and create innovation by engaging themselves with industry as well as build the country towards KBS. At the same time, these knowledge workers build the country's competitative advantage. According to the former Deputy Director of National Research University Project "the base of the sustainable society lies in implementing the knowledge gained from universities to empower people culturally and materially," (Appendix G: 1-1).

5.1.1 Concept of KBS in the Context of Thailand.

Experts from the three categories believed that the challenges for all countries and for all the societies are that all are living in an age where there is a rapid change in market or in the global level. Everyone is facing the challenge of how to use the limited resources efficiently and effectively.

The current Chairperson of University of Council, CU (Appendix G: 1-1) stated the "understanding the value of knowledge and how to access the sources of knowledge are very important. It is also imperative that society should know where knowledge is built, disseminate and be able to verify the suitability as and when the need arises".

Every society and country needs its economic condition to be better and striving to move ahead economically. Due to the limitation of resources, they cannot operate their function in the same way that have been practicing or implementing hitherto, because one can no longer rely on consumption of natural resources and cheap labor. The Former Prime Minister of Thailand (Appendix G: 2-1) stated that

> All societies for all economies, the challenge is to create value from knowledge and from innovation. This could be way to lift the qualities of life and standard of living of Thai people within the society in the future. At the same time a society also faces the political and security challenges. Hence, the societies or the country needs a population with knowledge oriented to deal with above challenges and it's important that they have the knowledge to deal with these problems.

In the context of Thailand, it still needs to do much more to achieve this stage of process. Certainly, Thailand can be more productive in terms of using its knowledge, add value for the country development, and push the nation towards KBS.

With regards to the KBS in the context of Thailand, the experts from three categories relate their views with the development or enhancement of the quality of Thai people's life whether they are living in village or in communities or in urban areas. In order for local citizens to maintain good life, Thai universities need to support government policy through their deep involvement in capability and capacity building of the Thais through their teaching, research and training. The researcher further analysize the finding based on the expert categories (Table 4.1).

Category 1: Majority of the experts from this category confirmed that KBS should, at the very least, reflect those citizens who have an understanding about democracy capability and how to earn living with the good morals and ethics because it is a general term but education should be the primary factors that helps Thai society to achieve a KBS. Education alone may not be enough but education plus the ability to think to innovatively and applying basic knowledge to the real world and issues real world situations should be ascent or essential elements of KBS (Appendix G: 1-7).

According to the President of King Mongkut's University of Technology Thonburi (Appendix G: 1-4), KBS needs to deal with the activities that are more related to Science and Technology (S&T) in order to ensure knowledge and skill development. This needs continuous improvement in order to ensure availability of requisite human resources for KBS development. The Deputy Secretary General of OHEC, who is also the former Former Vice President for Research and International Affairs, CU and the President of National Science and Technology Development Agency (NSTDA) (Appendix G: 2-4; and 2-6), also gave similar opinion where he stated that S&T development from universities is effective and efficient way to ensure betterment of the society.

Category 2: The experts from the this category viewed that the KBS is concerned with the four pillars, where faculty or teaching members can raise overall the country performance by using knowledge as the property of the country. The four pillars are education, research, training and development. In fact, transferring the university's knowledge to the Thai people and its stakeholder, who are physically or virtually close to the universities playing this significant role? Additionally, every individual of the country need to access different information and gained the knowledge within the society. The former Member of Pairliament (Appendix G: 2-2) stated that the:

> KBS mean a society which has gone through a Knowledge Revolution. Knowledge revolution is so powerful to change the paradigm in every setting of Thai society driven by Knowledge. Driven by knowledge in such a way that it will produce economic change to become knowledge base economy as one. Then produce changing politics to become Knowledge Base Policy Politics that means politic will be policy driven and then KBS will mean permeate that entire society that is driven by Knowledge. Therefore true knowledge Base Thailand will only happen when they is a Knowledge Revolution, which there is a complete radical outlook change that has set in the System, the Structure, the Institution and the Values that would allow changes to happen fully, without such, a society may be influenced by Knowledge

> but not a true KBS. KBS that is only happen after there is Knowledge Revolution, which is applying in Thai society fully. Then can be officially called Thailand a Knowledge Base Society".

According to the President of NSTDA "KBS can raise Thai GDP without destroying the environment and maintaining the quality of life" (Appendix G: 2-6). KBS is concern with education and development of product and services based on knowledge, either it is from the government or non-government. The majority of the experts, especially the category 1 and 2 perceived that the nine research universities focused in this research are the top universities of the country and they have it in their hearts to moving Thailand towards the KBS by producing and creating knowledge as well as talented knowledge workers. All these knowledge workers after graduation can create and generate new knowledge and ensure innovation as knowledgeable wokers are the key forces as they embark towards new life in modernization era. However, these experts were concern regarding the government policies towards KBS. These experts also opnined that the universities are places where knowledge workers are able to shape their vision and ideas. Universities, in terms of their main contributions toward KBS could be classiefed as those who,

1) Educate and turn the graduates for betterment of Thai society and help the industry sector;
2) Create new knowledge and contribution to the world which in terms contribute to local society and local industry as a whole;
3) Offering of academic services to all sectors of the society.

For instance, Siriraj Medical School, Mahidol University produces Thai traditional doctors and nurses who helps the people, who work in the medical education technology. The School conducts three programs: first is to produce knowledge, second is to produce program and third is to improve public education or academic services. These three programs are intendted to introduce health care knowledge and related issues to every patient who received treatement from the hospital for self or family. In terms of university contribution towards KBS, Sriraj hospital is the first in producing knowledge and in producing graduates and then through them improve public education or academic services (Appendix G: 1-6).

Category 3 experts opined that the universities contribute to KBS in many ways such as teaching, cultivating student's knowldge, competency and skills which can be closely connected to the knowledge industry which added value compared with the traditional labor intensive industry. One of the expert, viewed that the

> Thai Universities are expected to play a key role in assisting the country towards KBS, because, through research they produce new knowledge, new creation, new inventions, and new innovative technology for the betterment of the county as well enhance the competitive advantage (Appendix G: 3-3).

Some of the experts from these three categories specifically viewed that the Buddhist wisdom is the basis for the Thai way of thinking towards a KBS. Several experts including from all the three categories, mentioned about the importance of Thai culture and the KBS should be based on the local wisdom to bring forward the country towards KBS rather than focusing only on the modernization and globalization where consumerism is more focused.

95% of the experts agreed that KBS is concerned with where universities should create the knowledge and betterment of the society as well as sharing the gained knowledge with the local people and its surrounding area that enables development towards Thailand becoming a KBS. In addition, knowledge creation and production of the university helps Thai people to prosper in their lives, as well as enhance their quality of life. These concluded here similar meaning of KBS, which is reflected in the literature in regards to the meaning of KBS and also the definition of KBS in this study (Bell, 1973; Spangenberg & Mesicek, 2002; Santiago et al., 2008; Sharma et al., 2008a; Kefela, 2010; Melnikas, 2010).

Key findings

1) Creating the knowledge and betterment of the society as well as sharing the gained knowledged to the Thai society;

2) Creating value from knowledge and innovation that could lift or enhance the qualities of life and standard of living of Thai people;

3) Reflecting citizen's (Thai) understanding about democracy capability and how to earn living with the good morals and ethics as well as ability to think to innovatively applying basic knowledge to the real world;

4) Raised overall the country performance by using knowledge as the property of the country.

5.1.2 Charecteristics of KBS

Geographically, Thailand is in right location in Southeast Asia to become a regional education hub. With its liberal values in terms of democracy, transparency coupled with good functioning market economy, it has a potential to become an example to other developing nations. In this context, universities have a role to play by appraising the needs to reduce the gab between it and the society. A positive role from government agencies in the form of suitiable policies and regulation is needed which will need long terms perspectives. In this regard, government needs to follow this mission, irrespectives of short-term deviation to garner benefits of future generation.

Based on the consistency with addressed research question, the researcher focuses the finding of contributing factors through university that could shape Thailand to become KBS in eight different factors and these are 1) Human capital; 2) Academic Quality; 3) Culture; 4) Governance; 5) Research; 6) Innovation; 7) Infrastructure; 8) Information and Communication Technology (ICT). They are summarized as below.

5.1.2.1 Human Capital

The first factor that contributes through university towards Thailand becoming a KBS is the human capital. Experts from Category 1 agreed that development of human capital is one of the main focuses of the government and also the general public. This development is mainly carried through levelling up the education level of Thai citizen by raising the research capacity and competency of Thai universities. The success of the government supports reflected that number of higher education institutions has increased since last century. In addition, in the late century, government policies have been beneficial to the Thai society through allowing public and private higher education institutions to play a significant role in the development of Thailand.

The Category 2 experts trusted that the nine research universities have played a significant role among all the universities in producing the human capital for

the country development and bringing its own nation toward the KBS. However, increasing numbers of the higher education institutions in Thailand have increased the competition among the universities to produce and enhance the quality human capital to yield eminence knowledge, skills and competency. But the advantage of the 9 research universities is that they are the pioneered research universities of Thailand also in their capabilities and capacities to produce human capital.

The experts from the Category 3 perceived that the Thai universities needs to accept the reality where competition is based on university ranking, based on research outputs, based on impact that research from university have on the industry and social development. Further, there are limited resources in industry and is not up to date as per requirement for the country development especially the technical skills and managerial capabilities of the local Thai people. Competitiveness and skills development could enhance Thailand towards the KBS in the both cases of inbound and outbound knowledge (Appendix G: 3-5). In the development of human capital, universities need to sharpern the competency of the knowledge worker during their study period in the university. University's graduate also should learn the skills that could generate their career at the same time impact on the country development.

In addition, researchers produced from the Thai universities should have capabilities and capacities (Competency) to find new knowledge area. Though, universities are engendering enormous graduate students with a lot of degrees masterpieces. However, the qualities of researchers are not up to the standard. The experience of the experts towards the graduates or new knowledge workers was that the majority of these graduates have no clear understanding of the research problem and also not able to do research especially finding new knowledge and innovation.

In this regards, Thai universities could produce the researchers that could have the understanding of how to have the right methodology framework to combat the solution of finding new knowledge that would be a very key powerful solution. The experts argued that university must be willing to contribute its expertise in whatever needed in society. University must see them not separate from society. It has to be is from their strength, whatever they can contribute they must be willing to walk the next extra mile, so that the society can be contributors.

Knowledge produce from the university must be dynamic and upgrade with updated curriculum. It is important that knowledge workers have the knowledge to deal with societal problems. Based on the expert's opinion, the researcher found that the universities have three mains functions:

1) Educating their students to become graduates that provide the basic knowledge and skills that people should have;

2) Ability to carry out the research that can expand frontiers of knowledge and also create researchers;

3) Linking up graduates with society to strengthen communities to help businesses and add value.

Graduates produced from the universities with highest level of academic degrees, once they merged with the society, they are the knowledgeable people. Thus, the graduate students must know the logic of finishing the given task and ability to know the depth of education that is able to analysis and to make themselves knowledgeable person. These findings are supported by other scholars (Brempong et al., 2006; Hanushek & Woessmann, 2008; Cohen & Kisker, 2010; Abel & Deitz, 2011; Mitra et al., 2011) that accumulation of human capital such as knowledge, skill and competency from universities is the major sources of sustainable development of the country as well as moving forward and leveraging the nation towards knowledge society. At the same time it provide additional value to a nation and prosperous and healthy environment (Goldstein & Renault, 2004; Abel & Deitz, 2011).

Key Findings:

1) Human capital is one of the main focuses of the government and also the general public;

2) Research universities produce and enhance the quality human capital to yield eminence knowledge, skills and competency;

3) Competitiveness and skills development could enhance Thailand towards the KBS in both cases of inbound and outbound knowledge;

4) Thai universities should have capabilities and capacities (Competency) to find new knowledge area.

5.1.2.2 Academic Quality

Experts from all three categories supported that the academic quality is another main factor, which boost and drive the nation towards KBS. With the support from the local government, Thai universities are enhancing and strengthening the quality of education. The majority of experts supported the idea that universities need to maintain their academic standing and academic quality whether it is research university or teaching university or vocational institution.

Experts especially from the category 1 and 2 support and agreed that the production of highly qualified (educated) graduates into the society from the Thai universities enhances the nations more towards KBS. However, universities still have to preserve the standard and the quality of the education. They should not only simply keep the Degree out and have the money to contribute to prime education of their university but also strictly maintain the standard of the graduates that can contribute to the society later once they get to graduate from university. This is confirmed with the study of other scholars (DFES, 2003; Dill & Soo, 2004 and 2005; Dill, 2006) that academic quality is most important tool in the knowledge market and is equally important for the country in bringing towards KBS.

According to Deputy Director (Appendix G: 2-7) of the Office for National Education Standards and Quality Assessment (ONESQA), ONESQA carried out the assessement of Quality Assurance (QA) of Thai Universities including research universities. ONESQA is only public organizations responsible for assessing the external QA and accredition of the Thai universities. Under the Thai National Education Act of 2542 (1999), universities are subject to external accreditation once every five years and must present the results to relevant agencies and the public.

According to ONESQA, there are total of 18 key performance indicators grouped in six main areas, and these are as follows:

1) Standard of Graduates;
2) Research and Creative Work;
3) Academic Services to Society;
4) Preservation of Arts and Culture;
5) Institutional and Human Resources Development;
6) Internal Quality Assurance Standard: Quality development, monitory and assessment.

The report of the ONESQA indicates that academic quality and the overall performance of the national research universities are above the average of other public and private universities. Moreover, ONESQA (2010) stressed that the

> Thailand's quality is naturally a reflection of the quality of Thai people. Subsequently, the total quality of a university is a reflection of the quality of its sub-units. Quality, therefore, is logically at the heart of the sustainability development. Thus all educational institutions are accountable to be whole society.

Experts from the category 1 and 2, informed and shared that the universities need to always perform and upgrade the quality of their lecturers in producing the quality scholars or students for the sustainability of the country development. The focusing on upgrading the quality of lecturers directly influences the student learning process and enhancing their capacity in contribution of their knowledge towards KBS.

Furthermore, Standard protocol needs to be framed such as quality thesis, course work requirement and various nurturing environments of the graduate schools. Also, regular communication between students and faculties to be trained based on the program and not simply graduating without only increased knowledge but must be evaluated for each subject that they can take and each piece of work that they does and also evaluate based on overall performance.

Some of the experts mentioned that besides the course work, student activities and their contribution outside the university campus also play significant role and it is exemplary for the future students. Getting meaningful by getting involved in social responsibilities, visiting communities, share knowledge and understanding their needs as well as learn from the field from the local people and local knowledge (two ways of learning and sharing knowledge).

Furthermore, the finding shows that the majority of the experts from the three categories believe that the university products (graduates) are not so efficient to meet the industry demand due to lack of required skills for industry. Thus, the industries have to train them on the work content and language skill. To be in KBS

with globalized era, English language skill is very important. Academic skill, generic skill and technical skill are also another important aspect, of skill sets private companies intend to see among graduate students.

Experts from the Category 2 supports and believes that the university mandate is to prepare the workforce or knowledge workers to be ready for the labour market to enter both private and public sectors. University facilitates analytical thinking and problem solving in general but key lies with how a problem is solved and how interaction takes place with different environment. It is desirable that the university have enough budget, enough facilities, database, infrastructure, time to conduct research ensuring that a faculty member not just teach but also provide research for the betterment of the society and the country as a whole.

Excellence is another factor for a place to attract talents to work, build talent researchers, people with good knowledge for the KBS development. Thus, the key is to build quality students or course research to proceed towards quality scientists and engineers. There are relevant needs to be realized and transpired to students while being at the university to make them prepared to be part of society. The initial focus could be climate changes issue, sustainable issues. Science and Technology can be the source of techno tools but it needs to be careful as wrong implementation might lead to harmful effects. Issues on morality in terms of use of technology are also important. These finding are supported by the study of other scholars (Santiago et al., 2008).

Key Findings

1) Universities need to maintain their academic standing and academic quality;

2) Academic quality is important tools in the knowledge market and is equally important for the country in bringing towards KBS;

3) Perform and upgrade the quality of their lecturers in producing the quality scholars;

4) Highly qualified graduates into the society (from the Thai universities) enhances the nations more towards KBS.

5.1.2.3 Governance

Governing of university with proper accountability and transparency is very vital for the countries development as university is the students first learning

point and decision-making process that they learned during their study period in the university.

Experts from the Category 1, opine that the Governance of university do impact in graduates life long process especially understanding the true meaning of accountability and transparency when these new knowledge workers flows toward the emerging knowledge, where they will be contributing toward nation building.

Out of nine research universities, six (Chiang Mai University; Chulalongkorn University; King Mongkut's University of Technology Thonburi; Mahidol University and Suranee University of Technology) are operating autonomously without control by the government. This allows these universities to be proactive and reactive, fast and flexible to the market demands. At the same time, these universitices are efficient and effective in responding and solving the societal problem. This finding is supported by the study of the other scholars (Baird, 1997; Amaral et al., 2002; Mook, 2002; Sporn, 2003; Tighe, 2003; Bleiklie & Kogan, 2007; Fielden, 2008; Altbach et al., 2011; Bastedo, 2012).

At the sametime, universities are accountable for the quality of eduation or academic quality as well as they takes social responsibility and the financial integritity. Thus, assesement of the academic quality, evaluating the performance of the university and auditing of the financial performance carried out transparently is essential (Appendix G: 1-1; 1-3).

Experts from Category 2 and 3 believe that Thai university leaders lead the university in the business as usual and roll out graduates and research production without much clear-targeted direction. As they maintain the system, they allow the university to function with normal practice, and limited clarity of the outcome and limited real powerful punch in effect in university that require leadership. The leaders might not view clearly the future in a strategic way.

Majority of experts views that university leaders can impact by changes in the society. However, they do not design the process in their universities to produce an outcome rather focus on the output. Several expert do agree that the universities leaders are having clear vision where they bridge gap between the new technology and societal development of the country through universities. However lack of expertise in their universities failed to provide those required knowledge to the society.

Key Findings

1) Governance of university impact in graduate's life long process;

2) Universities needs to be proactive and reactive, fast and flexible to the market demands;

3) Universities are accountable for the quality of eduation or academic quality;

4) University's leadership can impact the changes in the society.

5.1.2.4 Culture

Several experts especially from the Category 1 and 2 opine that Thailand and the Thai universities are not yet having fully research-based culture.

Experts from cateogory 1 opined that the general lifestyle in the country is dependent on natural resources and Thai people are quite happy with the way of life. To carry out research activities, the highly desirable universities like those 9 research universities play a greater role. If compared with the number of research papers 100 years ago and now, a huge mismatch would be seen and the place need to keep it up to ensure that Thailand have a research based society.

The category 2 experts viewed that the parameters to enforce university to create a culture of carrying our research are most important. A research university tends to contribute to the society in terms of maintaining or elevating their ability of doing research but to be of interest to the society, the research have to be close to the needs.

Numbers of the experts viewed that most of universities conduct research based on their degree of training of the associated faculty member. For instance, those who graduated with highest level of academic degree from western universities, focus mostly on basic research, which may not be relevant to Thailand at this stage, which limits their ability to apply themselves to be in the top level in Thailand unless local adaptation is adhered. Thus, it is very important if they were trained, able to do the research they have to be able to apply their knowledge to do the research that pertains to the county's interest which would lead towards KBS.

The experts from all the three categories believed that there is gap in understanding the culture based on three different levels in universities as shown below in the figure 5.1. First level of gap understands between decision makers and the researcher at the faculty level. At the highest level of decision makers, they are more focus on bringing their universities in top ranking and platform to serve the country. At the faculty, level there is more concentrating on the ground level and where they have their expertise and clear with very focus in the field.

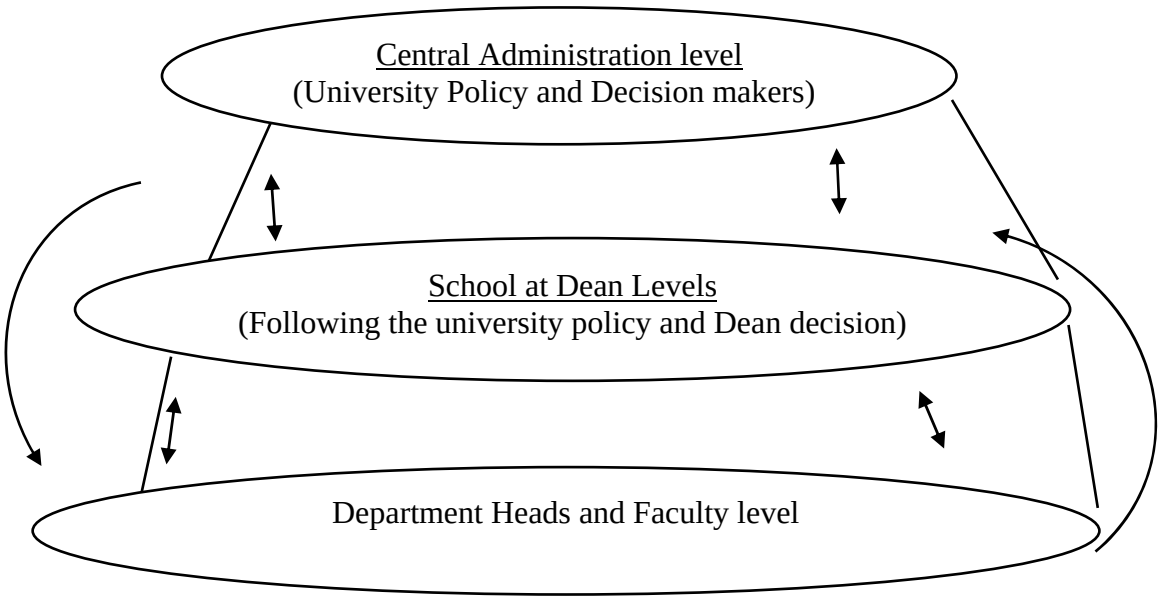


Figure 5.1 Gap in Understanding the Culture Based on Three Different Levels

On the other hand, communication between different level faculty to dean level and to the central administration level, there is huge gap, which impacts on bringing the universities toward direction of research based Culture University. In addition, some of the expert viewed that the some of the faculty members in the universities create their own boundaries, where they limit themselves from faculty members.

Key findings

1) Enforce university to create a culture of carrying out research;

2) Gap in understanding the culture based on three different levels in universities.

3) Communication gap between faculty members, School Deans and the University Central Administration.

5.1.2.5 Research

In the world of globalization and modernization, competition is normal especially in higher education where competition is based on university rankings based on research outputs, impact of research to the industry and social development. However, Thailand has been positioning itself as the hub of Asia and Southeast Asia. It is also one of the major countries in ASEAN in receiving the foreign direct investment from the Multinational Companies (MNC).

The research is one of the key tasks of Thai research universities, where they transform those frontier knowledge workers to be useful for the Thai Society (Appendix G: 2-1). However, the pressure of the reality always make them face difficulties in maintaining a balance between generating graduates, publications, maintain their ranking and academic positions and at the same time remain responsible to address the knowledge related issues faced by the country. Due to very nature of the competition among universities, there is always a risk that one university might duplicate the work of others. This provision impairs the ability to view a bigger picture and there is need for facilitator. There is need for a clear and common vision. In this regards, government has the right resources to offer strategic directions and coordinate their activities to esure that the research resources are channelized towards right direction.

Most of the experts from the Category 1 stated that the most of MNC preferred their main research to be carried out in their home country. Thus, there is lack of interest in research to be carried out in Thailand from MNC. Another reason for the lack of research interest from MNC is that human capitals produced by the local universities are not able fulfil the demand of the MNC. This impacts on the Thai industry, concurrently, the “local Thai company’s lack of passion and patience in getting research result, as they would like to have immediate result” (Appendix F: 1-5). This impact is loosing of research interest from the local Thai companies.

Therefore, with the supports from the government, its agencies motivate the local companies and the research universities to carry out the right type of research where knowledge can build. In this context, the research universities should able to transform the frontline knowledge workers to be the useful for the people (Appendix G: 1-1 to 1:7).

In addition, majority experts of Category 2 (including some of the experts from category 1 and 3) agreed that the Thai government is supporting in raising the education level of Thai citizen. They also encourage university to raise the research competency of Thai university. Thai Government is promoting and encouraging Thai Companies to carry out more research that can be beneficial to the society. For these purposes, there are few government agencies, such as NSTDA (Appendix G: 2-6), where they support the local industry to carry more research. In this regards, government compensate through income tax return to these company. However, there are lacks of interest from the local industry as perceived by the experts.

Nevertheless, research is one of the four pillars of the universities and the nine-research universities play a very significant role producing different type of research either it is applied research or basic research. The most of the experts stressed that universities must carry out the research to produce new product and new ideas as well as country to move forward and Thailand to be KBS. Moreover, research is one part of tools for Thailand that can move forward KBS. Thai research does help nation moving towards KBS because every research producing some knowledge has some indirect contribution towards society. Experts consent that the universities are more capable of doing more research, which is related to the government priorities and to the private sector so that country can flourish further and move towards KBS.

However, some of the expert do believe that research alone may not be significant but somehow it creates the ripple needed. Experts especially from the category 2 and 3 agreed that most of the professional researchers stationed in the Research University itself. Therefore, Research Universities should be given opportunities to be a key player, to be the impetus, to be the driving process to allow KBS to be generated down the road (Appendix G: 2-2). The experts suggested that leaders and government need to practically encourage and stimulate Research

Universities in Thailand to be powerful vehicles in generating and creating knowledge that has relevance and practical ramification in the very sphere including commercial, commercial sphere and so forth.

The researchers in these nine universities intended to make the research more relevant to the country development. However, the several experts from Category 1 and 2 viewed that most of the academician conduct researches for research sake to develop their own body of knowledge for teaching but very limited go beyond research for development or for commercialization. Only the publication and citation by researchers are not enough for the research universities but it should be executed and beneficial for the industrial sector and the local community.

> One of the experts says, “Borrowing knowledge and transferring Knowledge is not enough for any society to survive. It has to be produced within its own context to solve its own societal problem. University focus on Knowledge and it is an institution that creates knowledge, accumulate knowledge, extend knowledge and disseminate knowledge. In this context, university has to play the important role and trickling down the knowledge to the grass root level. Full effects come when the university is not only teaching, but also research in seriousness. Consequently, an institution is very important in changing society. It is not only a symbol, but it’s also the vehicle to allow change to happen. Therefore research universities produces Knowledge through research relevant to the context about Thai Society is important. Therefore the major vehicle at the top level that could dissipate the KBS down all the way down to the entire society” (Appendix G: 2-2).

At present, research in Thailand seems not powerful enough but if continued with current phase of research, in long time, it will provide the cumulative knowledge and ensure the driving force for moving towards KBS. Based on the interviews, the researcher found that the role of Thai research is to contribute to the national KBS in four ways:

1) To create a new knowledge through academic basic research and applied research;

2) The Knowledge to be contributed to the development of the society;

3) Knowledge contribution to the industrial and commercialize sectors;

4) The research contribution for the policy making of the country.

Experts from Category 3 opinion that research universities needs to introduce multi-disciplinary research approach. Big research project cannot be completed only by one discipline or by one department, it need the collaboration between different disciplines and departments. University researchers should be able to focus on particular knowledge either scientific or humanistic or arts, at the same time able to take the challenges of different responsibilities. These experts also agreed that the research should also be more relevant to the governmental or developmental goals rather than publication oriented research.

The majority of the experts voiced that if the government do not focus and put enough attention on research Universities and pay only lip service, society cannot be driven towards KBS because the main things to do so is the university as the key driving force which will produce elites or knowledge workers of the next generation and also inculcate values in the students and the researcher.

Holistically, the study found that Thai research universities have three different levels of a research body in their universities that carried out their research activities for the benefits of the society and these are through:

1) Centre of Excellences, which is mainly focus on fundamental and basic research;

2) Centre of Innovations, which works closely with industry and community and private sector;

3) Centre of Developments, which applied the new technologies and knowledge to put in practice or experiment for better product and service development.

To support the above three different levels, Thailand has the dual system support. These supports are from the Government to the universities in terms of funding and another channel is from the project-based supports from other government agencies or international organization and the local government or private sectors. With the supports from these dual systems, research universities are able to transform frontier knowledge to be the knowledge that is useful for the people who needs that knowledge.

Key Findings

1) Research is one of the key task of Thai research universities, to transform the knowledge worker**;**

2) Government is supporting in raising the education level of Thai citizen, has the right resources to offer strategic directions**;**

3) Thai Government and its agencies are promoting and encouraging Thai Companies to carry out more research.

5.1.2.6 Research Funding

Thai Government supported research funding through different government agencies where researchers, experts, or faculty members from different universities can get the research funding of science and technology as well as other fields. However, several experts especially the category 1 experts believed that the funding from government is not much beneficial to the country. Government do invests heavily to promote science and technology but it does not drive much further. There are needs that have to be a mechanized such as university and industry partnership, that would be significant for the country development as well as producing more industry oriented knowledge workers.

However, the overall education budget has gone up for the last ten years as shown in the figure 2.2. Since the budget for universities are low, this might not have much impact on the societal development and on the knowledge development. Most of the category 1 experts encouraged that the government need to explore partnership with industry or private sector to provide enough budgets to universities at the same time assess the university performance and its outcome. Government in allocating enough budgets with the support from the private sector to the universities, the assessment to access the outcome of the university apart from the internal

assessment could be done. Moreover, the government agencies do evaluate the university performance at the government level but they could not deliver due to limited human resources to carry out the assessment.

Assessment could benefit in understanding the outcome and knowing the demand and the problem of the country and in which direction universities and government need to be focused. Based on the assessment report, the external and internal team can sit and discuss together like which cluster they have got enough research to develop for commercial purpose or to educate people in that field, for which cluster they still lack information to back up and then continue to promote those cluster.

However, the research funding need to be categorized in three level: namely academic integrity, university social responsibility and financial integrity with the involvement of means of auditing to ensure the transparency (Appendix G: 1-3). Most of the expert especially from the category 1 and 2 voiced that the government needs to make sure that they hold their integrity when they assign and allocate research budget. It would be very risky if the government allocate research budget to particular groups that creates some kind of biase that happens very easily in term of selecting certain researcher group to conduct research. The result of such research could be the worst, more or less they know what they want if the government know what they want and they just need some kind of documents to backup what they want that is a good example of bad practice and that the leads to political issue.

In addition, there are limited investments on research from the private sector. Most of the researchers in nine universities few researches conducted with the private sector. Research funding is mostly from the government supports and very few contributions from the private sector. The private sectors are more comfortable buying technology rather than developing the technology by themselves in Thailand. Therefore, several experts suggested encouraging private sector especially the small medium enterprises to carry out the research that can be beneficial for their company and to the country.

The universities are the key driving force, which produce elites for the next generation and inculcate values in the students and the researchers. Experts viewed that the young researchers and also the university itself have structurally been

put on society that in the twine interrelated with another institution and social structure and until to produce a system integrated as a whole system in Thai law. Therefore, it is believed that when one drives the university forward, it affects the knowledge base society eventually that would be key pivotal institution that the government would like to focus. Thus, if the government does not focus and put enough attention on Research Universities and pay only lip service, society cannot be driven towards KBS.

Key findings

1) Funding from government is not much benefiting to the country;

2) Mechanizing the university and industry partnership;

3) Government needs to make sure that they hold their integrity when they assign and allocate research budget;

4) Encourage private sector especially the small medium enterprises to carry out the research.

5.1.2.7 Innovation

Majority of the experts expressed that the role of research in Thailand is to improve the productivity and increase sustainability in general fields like agriculture, service, production and manufacturing at the same time bringing in the innovation in those industry. Knowledge has been important for better living of a society and help improving competitiveness of the country and to do that one need to improve continuously in harmony with environment.

One of the experts (Appendix G: 1-5) from the category 1 says, “The innovation from the university that leads to economic development is rare anywhere in the world”. However, innovation from university do embark and spark the researcher and the industry to bring further those innovative things to be commercialized (Appendix G: 1-3 to 1-5). This finding supports by other scholars (James, 1997; Russo, 1997; Marques et al., 2006; Asheim et al., 2009; Asheim & Parrilli, 2012). Several experts notion that the innovation mainly comes from the industry and Thailand Industry is weak in terms of innovation. This impact on the innovation in general for the country development, even university is strong in innovation but industry is weak, this might not help the country to move towards the

KBS. Thus, country industry needs to be strong in innovation, especially the small medium enterprise (SMEs).

On the other hand, communities and societies in Thailand are having capable human resources which are knowledgeable and that could contribute national innovation and production system. By this way knowledge can be used in the society to empower people both culturally and materially and this is the bases of the sustainable society. Stimulating "creative innovative research by stimulating with smart funding would be helpful. Once smart funding is being put in, it will create productive research, not wasteful and be not just a research that is put on a shelf which remains less applicable," says one of the experts from category 2 (Appendix G:1-2).

Therefore, the government with the support from the private sector has to use smart funding that would stimulate the government and private sector that can also allow interfacing of research universities with other sectors in a seamless way. Also, industry with the civil society would be allow the production of research to be practically used, encourageed by incentives to the people as well as the university. These way things would move along the line by allowing their research to be powerfully influencing the non-university sectors. Some of the experts from category 3 believe that the majority of Thais are lacking of in understanding the scientific discovery that reflect understanding or realization of the importance of discovery for the development.

Key Findings

1) Thailand Industry is weak in terms of innovation;

2) Communities and societies in Thailand are having capable human resources;

3) Majority of Thais are lacking in understanding the scientific discovery.

5.1.2.8 Infrastructure

In Thailand the research infrastructure is not well established and especially for the ordinary universities. With the science and technology infrastructure, universities can have enough research Knowledge. Universities need to encourage the private sector to do more knowledge generation through continuous

research with proper infrastructure support. Infrastructure support could be in operational infrastructure and scientific infrastructure. Experts from the category 1 and 2 viewed that will of political leadership plays important role and believe that Science and Technology Knowledge with proper infrastructure could enhance the country towards KBS.

Building talents and pulling talents towards KBS is very important. According to experts from category 3, the universities need to take lead to build the talent to strive Thailand towards excellences with relevance that creates value to society and to academics. The relevancy to society, which means research universities, collaborates with NGO and INGO together with public sector and private sector realizing the need of the society. This can gear the application of talents towards proper utilization that would create good impact on the society and strengthen the Thailand knowledge infrastructure.

Key Findings

1) Universities infrastructure in Thai universities are not well established;

2) Lack of support from Private sector towards Thai universities;

3) Private sector support towards university infrastructure plays instrumental roles;

4) Willingness of political leadership to play important role in university development including infrastructure development.

5.1.2.9 ICT

Thai universities are using ICT as a platform to educate and train the future knowledge workers. Universities provide full access to the internet and encourage knowledge workers to be more independent in developing and shaping its own knowledge.

Experts from category 1 confirmed that Thai research universities are linked together with each other. However, they opined that a closer network needs to be established with business sector as well as NGOs so that the society as a whole can gain from the research work and move towards KBS. ICT in this case could come handy. Offering ICT accesses to more people including rural and remote areas will

bring the society closer as well as it could be common platform for people to learn and share knowledge. This will offer a channel for lifelong learning and will eventually help the society to leapfrog towards KBS.

Experts from 2nd category believe that Thai society can use the ICT as instrument to empower its people to lead and build a sustainable society. Thus, the communication among various groups of people and its effect is very important. In this regard, ICT plays a very significant role for the country development as well as for the universities. Majority of the experts says that the challenges faced by Thai university today is that they tend to have a mismatch between demand and supply. Universities have a number of graduates who find it quite hard to find work while university face the enterprises complaining about lack of workers with the right skills. Therefore, the link between the higher education and the need of economy has to go hand by hand.

Experts from the category 3 believe that today's communication technology is efficient enough to support this with relevant support from modern IT systems. In addition, university scholars and scientists make use of ICT and facilitate transfer of technology from people who have it and of course they could contribute to expanding or advancing technology as well. Some of the experts stated that ICT is less important factor as compared with other factors given above. ICT do play instrumental tool to reach mass market.

Key Findings

1) Thai research universities are linked together with each other and apart

2) Closer network needs to be established with business sector as well as NGOs

3) ICT access to more people including rural and remote areas will bring society closer

4) Thai society can use the ICT as instrument to empower its people to lead and build a sustainable society

5) university scholars and scientists make use of ICT and facilitate transfer of technology

Based on the above analysis, the researcher summarized the key finding as follows in Table 5.1 This finding shows the nature of impact of the factor, implication of the factors toward society and the relationship of the factors with KBS.

Table 5.1 Summary of the Finding: Qualitative Data

Factors	**Nature of Impact**	**Implication toward Society**	**Relations to KBS**
HUC	Levelling up the education level of Thai citizen	Enhance the quality human capital to yield eminence knowledge, skills and competency	Industry and social development
ACQ	Supporting in raising the education level of Thai citizen	Increased the competition among the universities	Enhancement of the quality of Thai people's life
CUL	Enforce university to create a culture of carrying out research activities	Elevating the ability of doing research	Involved in social responsibilities
GOV	Understanding the true meaning of accountability and transparency	Enhancing and strengthening the quality of education	Add value to a nation and prosperous and healthy environment
RSH	Research capacity and competency of Thai universities. Capabilities and capacities to find new knowledge area.	Powerful vehicles in generating and creating knowledge	Strengthen the Thailand knowledge infrastructure

Table 5.1 (Continued)

Factors	Nature of Impact	Implication toward Society	Relations to KBS
INN	Enhance productivity and increase sustainability	Improve continuously with harmony to environment.	country development and strengthening competitiveness of the county
INF	Generate research Knowledge	Enhance the country towards KBS.	Building talents and pulling talents towards KBS
ICT	Instrument to empower	Facilitate transfer of technology from people who have it	leads and build a sustainable society

5.2 The Role of Thai Research Universities in Building Nation Towards KBS (Research Objective 2 in Chapter 1)

The role of research universities is to improve the productivity and increase sustainability against important sectors such as Agriculture; Service; Production and Manufacturing. It is because of the fact that knowledge is being the driving force and important factor to better living standard for the society and imparts competitiveness towards the country. Competitiveness comes from improving what Thailand has and by ensuring sustainability so as to enhance productivity. In this context, Science and Technological knowledge is the key for these improvements. Once knowledge is gained, it would improve the standard of human resources and that as a whole would improve the society and lead Thailand toward KBS (Appendix G: Category 1 and 2). The contribution of research universities towards Thailand becoming a KBS could be classified in four ways:

1) By discovering new area of knowledge that could be of academic benefits so that different kinds of basic research could be explored and initiated;

2) By identifying the different and specific knowledge areas that can contribute towards the development of Thai society and as well as enhance and strengthen the nation's competitive advantage;

3) By gaining new knowledge that would contribute strengthening industrial and commercial sectors development.

4) By conducting research that would contribute towards policy making for the country.

Based on the experts opinion on the contribution of Thai university's toward Thailand becoming KBS, the study found the degree of high and low in regards to the University Competence and University Compliance. The high or low competence and compliance relative to the finding from the above eight contributing factors. These are explained in detail below.

5.2.1 University Competence

The University Competence is clustered in two levels: low university competence and high university competence. The "Competence' in this part of study is defined as 'skill or standard of performance of the university'. University competence is the important dimension and it is defined as the university has the capabilities (able to execute the knowledge for societal benefits) and capacities (to absorb knowledge and translated it for societal beneficial) to contribute Thailand towards KBS. Clustering of the university competency as low or high is relative to the production of human capital to serve the country towards KBS. The human capital could be the skills, knowledge and competency of the graduate as well as academic quality and also relative to the finding of the other contributing factor of this study. These could be research and innovation and also the infrastructure and ICT.

1) Low University Competence

The low competence university means that the university capacities and capabilities are lower than those demonstrated by other university who perform same or the performance are lower as expected by the government and the general public. A university may have the capacity and capability to enhance the four pillars (Teaching, Research, Training and Development), but they need close support from the government and industry to leverage and enhance the quality of their academician

especially clear understanding in carrying out the research, creativeness and innovativeness. Low competence is also applied to the universities who are less keen to adapt the changes such as market driven curriculum, lack of understanding of research demand and lack of creativity and innovative in the university.

2) High University Competency

The high competence university means that universities are higher in level of capabilities and capacities to perform and demonstrate their activities and are beneficial for the Thai society. They are able to produce highly qualified human capital to generate new knowledge and bringing up the country towards the KBS. They are able to create and innovate knowledge as well as able to provide guidance toward new knowledge workers and also able to support the government in framing policy in bringing nations towards KBS. At the same time 'high competence university' acquiescence their curriculum with market driven approach and able to create innovative program to leverage for new knowledge worker for the sustainability of the country towards KBS.

5.2.2 University Compliance

The University Compliance is grouped in two levels: low university compliance and high university compliance. 'Compliance' in this part is defined as 'willingness and readiness of the university'. Grouping of the university compliance as low or high is because this study identified university compliance as an important dimension of the university's contribution towards Thailand becoming a KBS. Therefore, the university must be willing and ready to produce quality human capital with the quality academic standard. At the same time university needs to have highest level academic governance with clear accountability and transparency of their activities.

1) Low University Compliance

The low university compliance means university has less understanding of the changing platform of higher education paradigm in the global level as well as are not able to perform as per market driven approach because of availability of the limited resources. Universities in this group compliance with the government regulation. However, they are not able to keep up the standard as per the requirement

and are not able to produce new knowledge worker for strategic level. They are able to produce knowledge worker at function level or operation level in contributing toward Thailand toward KBs. In this regard, low university compliance group need close supervision either from the government or government agencies or from their university council in directing them towards high university compliance.

2) High University Compliance

High university compliance means university understand how to efficient and effectively perform their compliance in making Thailand becoming a KBS. Additionally, the university council, the leaders and faculty members of this group understand their role in bringing Thailand towards KBS. In this group, the university does not need close supervision or detail instruction either from the government or government agencies or from university council to ensure smooth operation and production of quality human capital as well as research production.

The finding shows that all the 9-research universities fall under this category. For instance, KMUTT has ranked 53 in Asian in 2013, Chulalongkorn and Mahidol University also among the top 100 universities in Asia and ranked in the world top universities. This shows these nine research universities have high level of compliance in contributing Thailand becoming KBS.

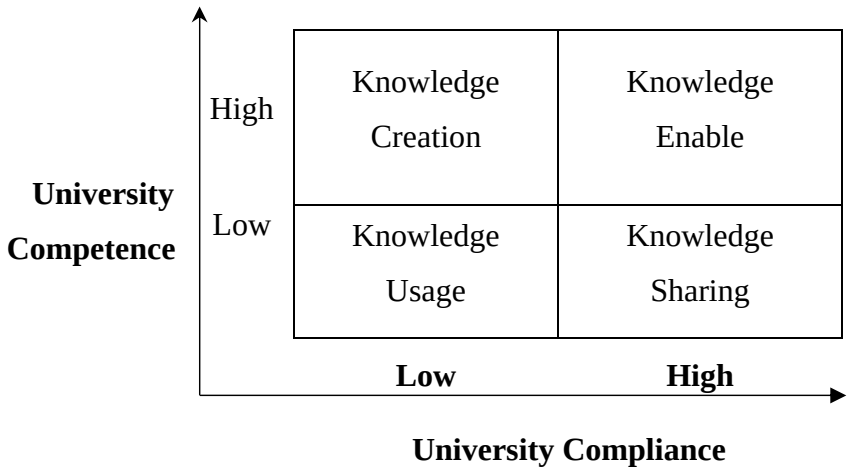


Figure 5.2 Contribution of University as a Mission of the University Competence and University Compliances Toward Thailand Becoming KBS.

Based on the two dimensions of the university compliance and the university competence, four types of the university's contribution towards Thailand becoming KBS can be identified, based on whether the university has a low or high level of university competence and a low or high level of university compliance. As demonstrated in the figure 5.2, these four types of the university's contribution are Knowledge Creation Knowledge usage, Knowledge sharing and Knowledge enable.

1) Knowledge Usage: University knowledge usages in either enhancing or eroding the university performance.

2) Knowledge Sharing: University shares its knowledge gain from their research activities

3) Knowledge Creation: University is able to create new knowledge

4) Knowledge enables: University is able to enable those gained knowledge to the society.

1) Knowledge Use: University contributes in using the knowledge to the society. University contributes the usage of knowledge, when the university competence and university compliance is low. This means that the university has a limited human capital in terms of skills, competency and knowledge, in terms of contribution towards KBS as well as performance of the university. In this regard, university that falls in this categories needs the close support from the government or government agencies in leveraging the human capital. University in this group only use the current existing knowledge to train the future knowledge workers such as following same traditional style of curriculum teaching method. The finding shows that 9 research universities do not fall in this group. However, there are other private and public universities that fall in this group and it needs study further to get the empirical evidence.

2) Knowledge Share: When there is low university competence with low university compliance, university shares the knowledge but are not able to contribute new knowledge area due to its limited resources such as lack of human capital, infrastructure and not fully utilizing the ICT resources.

3) Knowledge Creation: Where there is high university competence and low university compliance, there could be possibility of knowledge creation. At this stage, university has capabilities and capacities in creating new knowledge at the same time able to use that knowledge for societal benefits. However, those knowledge

are not able to lead the ultimate outcome that can be sustainable for the next generation.

4) Knowledge Enable: When there is high university competence with high university compliance, this is where universities are able to contribute all the given factors for the country to bringing towards the country towards KBS. Experts indicate that accomplishing this required high-level research with high level of innovation from the universities toward industry to enable that knowledge for mass consumption. At the same time, without destroying the environment, growth in the country GDP as well as possible gross national happiness.

5.3 Thai Universities to be Listed in the World Class University

Thailand could build their university as world Class University. Experts believe that following factors play important roles to support the universities to be world class universities.

1) Thai Universities Leader should have the clear vision in directing the universities toward world class universities. The leaders are the university council, President, Vice Presidents and the School Deans. They all should have clear understanding of their direction as well as must take the responsibility with clear accountability and transparency.

2) Human Capital is another factor, which plays important role in lifting up the knowledge area or expertise in the given field. Thus, researchers with high caliber need to be at the universities and universities must retain those experts.

3) University administrative and management system should be efficient and effective. University administration should be like cooperative style management and should escape from the bureaucratic regulation.

4) University must have enough and adequate scientific and operational infrastructure in order to sustain as well as to be able to generate better research and new knowledge areas.

5) University must draw the best and brightest students and they are able to become colleague. As they are the brand ambassadors for the university.

6) University must have exchange of faculty, staff and student with well established university overseas.

7) University must know how to adopt the technology to help its administration and its surrounding and the country development.

8) University must acknowledge the importance of ICT and must take the maximum advantage of ICT to help and support the university as well as manage the university efficiently and effectively.

9) University must be internationalized with focus on four areas, student component must be international; staff, academic staff, faculty staff must be composed of international.

10) University curriculum must be made or meet international standards with international accreditation.

11) The medium of teaching must be international for instance English as a medium of instruction.

12) University must be audit and evaluate their performance regularly for accuracy (Transparency and accountability).

13) University need cooperative culture in order to unite its people. Strong unity will have more power in order to coach and direct the university.

5.4 Summary

The three different groups of 31 experts were asked same questions about their understanding about the concept of KBS in the context of Thailand and critically analyzed the data and statement in concrete and textual format. Experts believe that quality of Thai people's life needs to be enhanced to maintain good life. In this regard, experts opine that education, research, training and development are the four pillars that could give better opportunities to each individual. These four pillars could be contributed from the educational institutions including HEIs supported by government and private sectors. These pillars can raise overall the country performance by using knowledge as the property of the country as well as bring the country towards the knowledge society.

The finding from the qualitative approach is categorized based on the conceptual framework of this study and opinions of experts are categorized accordingly. Experts do believe and strongly supported that production of human

capital from the universities enhanced not only the individual competency but also the country competitiveness in the global market. However, human capital produced from the Thai universities should have capabilities and capacities (Competency) to find new knowledge area. In addition, experts argued that university must be willing to contribute its expertise in whatever ways needed in society. University must see themselves not separate from society. It has to be that from their strength whatever they can contribute they must be willing to walk that next extra mile, so that the society can be developed.

With the regards to the academic quality, experts indicated that quality of teaching faculty members should be upgraded for the betterment of current scholars as well as for the future scholars, while preserving the university's standard and the quality of the education. Experts agreed that leaders of universities are visionary and governing their university with the accountability and transparency. However, Experts opine that Thai university leaders should not only govern the university as usual but also need to have clear vision with clear targeted direction. Majority of experts views that university leaders can impact by making changes in the society. However, they do not design the process in their universities to produce an outcome rather focus on the output.

The study revealed that Thailand has not yet had fully a research-based culture but need to cultivate in this direction. In addition, there is gap in cultural understanding between the central administration of the university and the faculty level. This widening gap is in implementing university goals and mission. Furthermore, experts viewed that research in universities are conducted for the sake of expanding the individual's own body of the knowledge and is limited for the commercialization of the research output. Experts suggested that research output need to executed which is beneficial for the community or industry. Moreover, the limited research funding is another barrier to embark on the new knowledge area of research. Based on the expert's opinion, the study developed the concept according to the degree of high and low in regards to the University Competence and University Compliance.

The next chapter presents the analysis of the quantitative method to support the finding of this chapter.

CHAPTER 6

EMPIRICAL RESULTS AND DISCUSSIONS OF QUANTITATIVE DATA

This chapter addresses third research objective of this study: factors contribution of Thai research universities toward Thailand becoming a KBS. In this regards, the researcher carried out the survey using a closed ended questionnaire (Appendix I) to understand the respondent's knowledge and their understanding about the contribution of universities towards Thailand becoming KBS. The survey questionnaires contain the respondents' background information and the items reflecting the study of this paper. Study used scale level of 1 to 10, 1 representing strongly disagree and 10 representing strongly agree. This scale better enables the respondent to understand the contribution of universities toward Thailand becoming a KBS. In addition, purpose of carrying this survey is to compliment the qualitative data.

6.1 Characteristics of the Respondents

The respondents of this study are the faculty members, research staff, doctoral and master students from 9 Thai research universities. Following figure 6.1 shows the distribution of the respondents from the 9 Thai research universities for this study. The largest number of the respondents are from Thammasat University (TU: 18 percent) followed by Kasertsart university (KU: 15 percent); King Mongkut University Thonburi (KMUTT: 18 percent); Khon Kean University (KKU: 10 percent); Suranaree University of Technology (SUT: 10 Percent); Chiang Mai University (CMU: 8 Percent); Prince of Songkla University (PSU: 7 Percent) and The least respondents are from Mahidol University (MU: 6 percent).

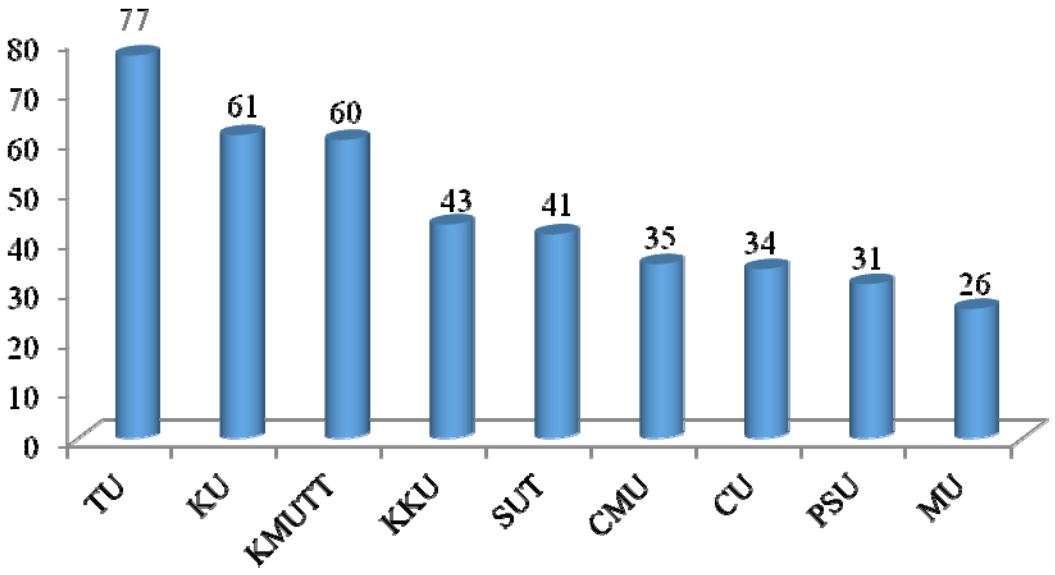


Figure 6.1 Distribution of Respondents from 9 Research Universities (n=408)

Following figure 6.2 present the current status of the respondents. It shows that 54 percent of the respondents are the faculty members, lecturer, professor, or instructor in Thai 9 research universities. 22 percent of the respondents are researcher at the universities, 11 percent of the respondents are doctoral students, and remaining 13 percent are Master students.

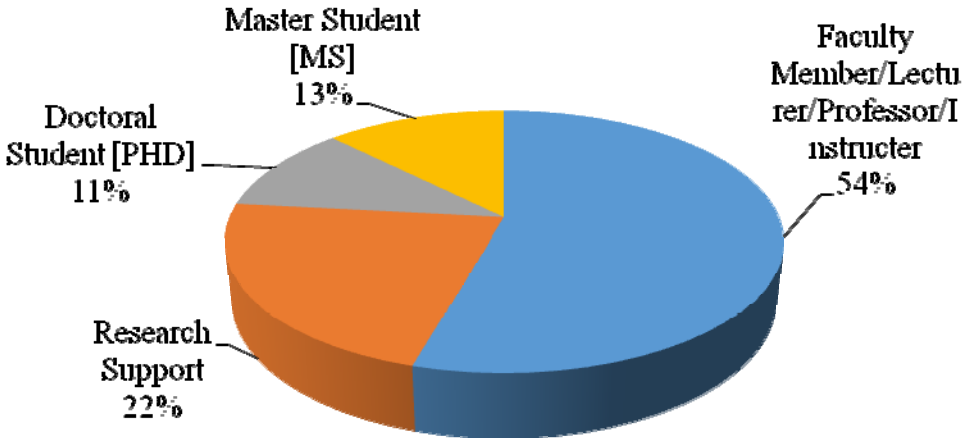


Figure 6.2 Respondents Group (n= 408)

In addition, the researcher asked respondents to provide their area of studies or field of current department they are employed. Following figure, 6.3 shows that 32 percent of respondents are from the engineering and technology or ICT Faculty (ET/ICT) and 24 percent of the respondents are from the Business, Management, or Economic Department (BME). 10 percent of the respondents are from the Agriculture or Fishery or Forestry program or department (AF). Some of the respondents are also from Education (ED), Medical and Nursing (M&N) and Science and Math (S&M). 15 percent of the respondents are from others program, which were not listed in the respondent's questionnaires. Diverse background of the respondents helps and supports this study in understanding their understanding on universities contribution towards Thailand becoming a KBS.

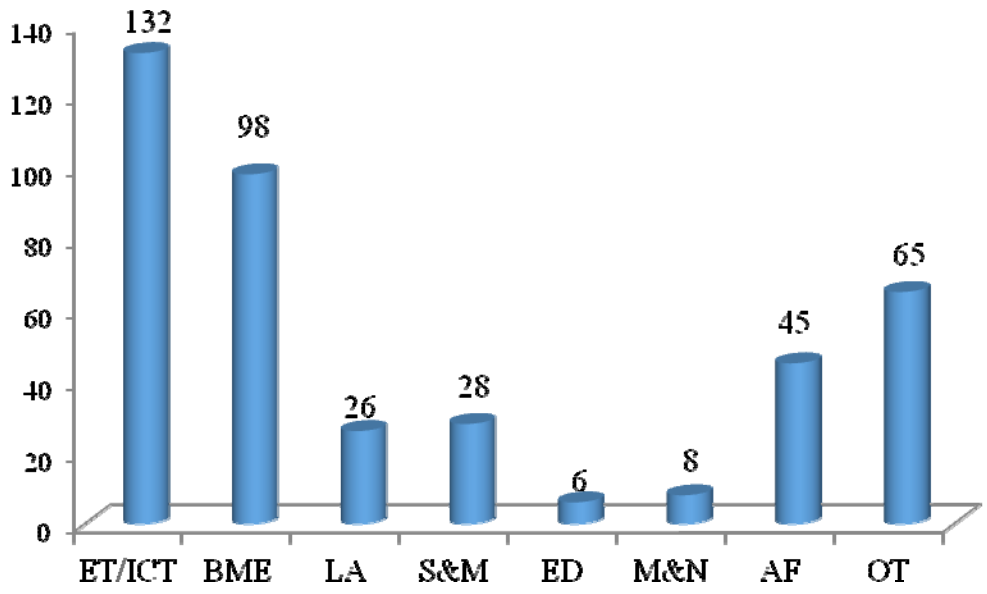


Figure 6.3 Respondent's Area of Study or Department at the University (n=408)

Figure 6.4 shows the gender distribution of the respondents for this study from 9 research universities. 51 percent of the respondents are female and 49 percent are the male.

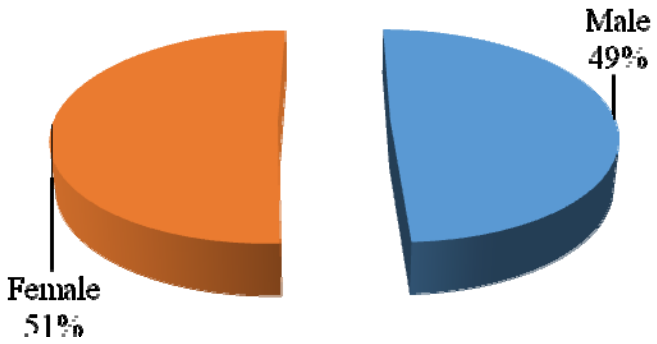


Figure 6.4 Gender Distribution

The researcher also requested the respondent's age, which could help in understanding their strong support on the items and their experience in the universities. Figure 6.5 shows that 38 percent of the respondents are from age group from 31 to 40 and 27 percent of the respondents are from 21 to 30. 23 percent of the respondents are in the group of 41 to 50 year old group. The remaining 10 percent of the respondents are in the age group of 51 to 70 year old. The oldest respondent of this survey is of 65 year old and the youngest respondent is age of 25 year old.

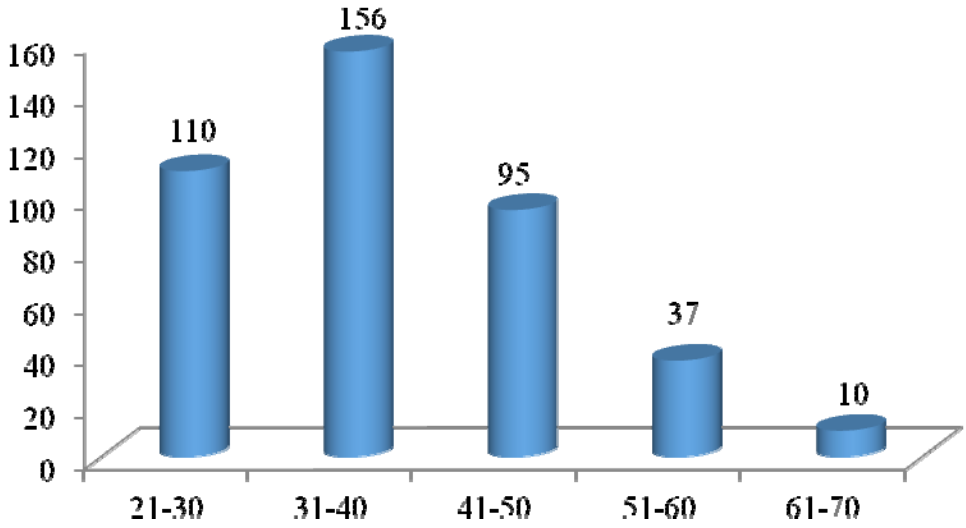


Figure 6.5 Respondents Age Group (n=408)

6.2 Result of KMO and Varimax Rotated of Nine Variables.

Based on the literature reviewed and the finding from the chapter 5, study further carried out the quantitative analysis to compliment and support the qualitative study. The actual cases were 650 and after screening the cases, 408 cases are complete and useful for further analysing the data. After screening the cases (respondents) and items, only 79 items were valid and reliable to carry the analysis. The factor analysis was carried out and 9 factor components were loaded, which were labelled accordingly. An item of these variables are based on literature review and is strongly supported by the finding from the qualitative study as shown in chapter 5.

Table 6.1 Summary of the KMO, Varimax Rotated Factor Matrix (n=408)

#	Variables	Number of Items	KMO	Item's Range Varimax Solution
1.	GOV	09	.882	.696 - .953
2.	CUL	07	.923	.688 - .759
3.	ACQ	06	.908	.529 - .659
4.	CON	08	.918	.508 - .945
5.	INN	12	.940	.727 - .852
6.	HUC	23	.961	.520 - .995
7.	ICT	08	.932	.544 - .951
8.	RSH	03	.753	.591 - .768
9.	INF	03	.702	.561 - .756

Table 6.1 shows the Bartlett's tests of Sphericity (Kinnear & Gray, 1994) and result shows that all the nine variables from all the respondent groups were significant ($p = 0.001$) and KMO results are above 0.5 which indicates that the variables are valid (Kaiser, 1974). Thus, both statistics allows and reassure the researcher and confidently proceed with further analysis for these nine variables. The table also presented the varimax rotated factor loaded ranged of the items of each variables, which shows the loading are above 0.5.

6.3 Relationship between Dependent and Independent Variables.

Contribution of universities towards country development has been vastly studied and empirical evidence support the assumption that education contributes the nations to move towards KBS. In addition, the empirical evidence suggests that university's education contributes to country development and improve the quality of general public (UNESCO, 1998; Chapman, 2006; Shi & Neubauer, 2009; De Boer et al., 2010;). This study focused on the Contributions of Thai research universities towards Thailand becoming a KBS. This study is to confirm the evidence but from three different perspectives.

The first part of this under this heading, the researcher focuses on the factors influence of the contribution of universities. For that purpose, the model including a criterion, and nine predictors was run to examine the correlation between dependent and independent variables. Respondents have responsed to the survey through online survey. In order to compare interrelationships among variables, the researcher analyzed the respondent's responses in two groups:

1) The respondents of first group are the faculty members
2) The second group includes the research staff, doctoral and master students.

The study further carried out three different correlations as shown in the table 6.2, 6.3 and 6.4. The purpose of having three different correlations is to analysis and compares the differences among the groups in their perception and understanding towards the given variables. Furthermore, nine more regressions were run to observe the significant relationship between the independent and dependent variables and also casual relationship is carried out using the path analysis.

6.3.1 Correlation Matrix and Descriptive Statistics

The result on table 6.2 shows inter-correlation of the variables respondents of first group: faculty members. This correlation data is based on the faculty member's responses on the given variables. Pearson correlation was calculated in examining the inter relationship between dependent and independent variables and found positively correlated.

The correlations among variables are at the moderate level, the lowest is at .238, which is the correlation between RSH and CON. The highest level of correlation is between ACQ and CUL, which is at .618. This indicates that as per group 1, they perceived that these two variables significant instrument influencing the university contributions towards Thailand becoming a KBS.

According to Anderson et al. (2011), a sample correlation coefficient greater than +70 or less -.70 for two independent variables is warning of potential problems caused by high multicollinearity. When the independent variables are highly correlated, it is not possible to determine the separate effect of any specific independent variable on the dependent variable.

The uppermost correlation at .618 as shown in table 6.2 is recognizing at an acceptable value. Therefore, there is no multicollinearity problem. The value of other two correlations shows that the values are less than 7.0. Subsequently, these results will not harm further analysis with linear regression analysis as well as path analysis.

Table 6.2 Pearson Correlation for Independent and Dependent Variables and Descriptive Statistic (Group 1: n = 222**)**

#	Variable	CON	ACQ	ICT	HUC	GOV	CUL	INN	INF	RSH
1.	**CON**	1								
2.	**ACQ**	.529**	1							
3.	**ICT**	.481**	.476**	1						
4.	**HUC**	.612**	.607**	.468**	1					
5.	**GOV**	.464**	.597**	.542**	.572**	1				
6.	**CUL**	.509**	**.618****	.551**	.522**	.606**	1			
7.	**INN**	.507**	.589**	.573**	.586**	.510**	.607**	1		
8.	**INF**	.514**	.502**	.588**	.535**	.567**	.570**	.626**	1	
9.	**RSH**	**.238****	.259**	.273**	.300**	.248**	.244**	.306**	.272**	1
	Ẋ	8.00	**8.18**	7.88	7.89	7.60	7.73	7.75	7.65	8.20
	S.D	0.89	0.99	1.08	0.80	1.25	**1.29**	1.05	1.21	0.82

Note: ** Correlation is Significant at the 0.01 Level (2 –tailed)

Specifically, the significant correlations were found between CON and ACQ (r=. 529, P <.001); ICT (r=.481, P<.001), HUC (r=.612, P <.001); GOV (r=.464, P <.001); CUL (r=.509, P <.001); INN (r=.507, P <.001); INF (r=.514, P <.001) and RSH (r=.238, P <.001) respectively. Significant highly positive correlations were also found between independent variables. All the independent variables are strongly correlated and show 99% of significant level. Among the independent variables, ACQ variable is highly positively correlated with other variables such as CUL (r=618, P <.001), HUC (r=.607, P <.001) and GOV (r=.597, P <.001) and INN (r = .589, P <.001).

The researcher further carried out the inter-correlation of the variables responded by second group (Research Staff, Doctoral and Master Students) shown in the table 6.3. Pearson correlation between dependent and independent variables and found positively correlated.

Table 6.3 Pearson Correlation for Independent and Dependent Variables and Descriptive Statistic (Group 2: n =186)

#	Variable	CON	ACQ	ICT	HUC	GOV	CUL	INN	INF	RSH
1.	**CON**	1								
2.	**ACQ**	.505**	1							
3.	**ICT**	.429**	.513**	1						
4.	**HUC**	.570**	.571**	.528**	1					
5.	**GOV**	.497**	.562**	.500**	.607**	1				
6.	**CUL**	.558**	.595**	.512**	.561**	.612**	1			
7.	**INN**	.417**	.543**	.495**	.578**	.557**	**.638****	1		
8.	**INF**	.450**	.494**	.564**	.505**	.488**	.632**	.582**	1	
9.	**RSH**	**.142**	.375**	.319**	.379**	.291**	.327**	.459**	.376**	1
	Ẋ	8.26	**8.36**	8.05	8.21	7.78	7.99	7.89	7.89	8.00
	S.D	0.82	0.96	0.98	0.73	**1.21**	1.12	1.09	1.13	0.64

Note: ** Correlation is Significant at the 0.01 Level (2 –tailed)

The correlations among variables are at the moderate level, the lowest is at .142, which is the correlation between RSH and CON as shown in above table 6.3. The highest level of correlation is in the relationship between CUL and INN which is at .638. This shows that as per group 2, they perceived that these two variables significant instrument influencing the university contributions towards Thailand becoming a KBS. Specifically, the significant correlations were found between CON and ACQ (r=. 505, P <.001); ICT (r=.429, P<.001), HUC (r=.570, P <.001); GOV (r=.497, P <.001); CUL (r=.558, P <.001); INN (r=.417, P <.001); INF (r=.450, P <.001) and RSH (r=.142, P <.001) respectively. Significant highly positive correlations were also found between independent variables. All the independent variables are strongly correlated and shows 99% of significant level. Among the independent variables, in addition to the CUL and INN, HUC and GOV (r=.607, P <.001); INN (r=.578, P <.001); CUL (r=.561, P <.001) and INF (r=.505, P <.001) variables are highly positively correlated.

From the table 6.2 and 6.3, in terms of the lowest correlation, the result indicates that both the group perceived the same variable i.e. Research. However, in regards to highest level correlation, there is differences in the perception between first and second group but CUL variable is common factor from the both the group.

1) According to the first group, between the independent variables ACQ and CUL is highly correlated.

2) As per the second group CUL and INN is highly correlated.

The researcher further merged both the group into one to further analyse the perception of the respondents towards the variables as a whole as shown in the table 6.4. The correlations among variables are at the moderate level, the lowest is at .221, which is the correlation between RSH and CON. This finding shows the same as in both the group as shown in table 6.3 and 6.4 as above. The highest level of correlation is in the relationship between HUC and CON which is at .666. This indicates that overall respondents perceived that these Human Capital variable is significant instrument influencing the university contributions towards Thailand becoming a KBS.

Table 6.4 Pearson Correlation for Independent and Dependent Variables and Descriptive Statistic (Overall: n =408)

#	Variable	CON	ACQ	ICT	HUC	GOV	CUL	INN	INF	RSH
1.	**CON**	1								
2.	**ACQ**	.540**	1							
3.	**ICT**	.495**	.490**	1						
4.	**HUC**	**.666****	.578**	.510**	1					
5.	**GOV**	.524**	.585**	.526**	.606**	1				
6.	**CUL**	.549**	.611**	.538**	.566**	.610**	1			
7.	**INN**	.491**	.554**	.519**	.576**	.512**	.615**	1		
8.	**INF**	.523**	.505**	.581**	.541**	.537**	.598**	.596**	1	
9.	**RSH**	**.221****	.346**	.292**	.358**	.281**	.327**	.419**	.358**	1
	Ẋ	8.21	8.26	7.95	8.00	**7.68**	7.85	7.79	7.76	7.97
	S.D	1.00	0.98	1.05	0.85	**1.23**	1.22	1.11	1.19	0.64

Note: ** Correlation is Significant at the 0.01 Level (2 –tailed)

Specifically, the significant correlations were found between CON and ACQ (r=. 540, P <.001); ICT (r=.495, P<.001), HUC (r=.666, P <.001); GOV (r=.524, P <.001); CUL (r=.549, P <.001); INN (r=.491, P <.001); INF (r=.523, P <.001) and RSH (r=.221, P <.001) respectively. Significant highly positive correlations were also found between independent variables. All the independent variables are strongly correlated and shows 99% of significant level. Among the independent variables, in addition to the CUL and INN, HUC variable is highly positively correlated with GOV (r=.607, P <.001); INN (r=.578, P <.001); CUL (r=.561, P <.001) and INF (r=.505, P <.001).

The results from the above table indicates that the relationship were such that higher scores of correlation between the dependent and independent variables, the more respondent's perception and understanding of the independent variables influences on the dependent variable.

The finding indicates that all the variable such as HUC, ACQ, ICT, CUL, INN, GOV, INF and RSH could be contributing factors through Thai research universities play important roles of their contribution in Thailand becoming a KBS.

The descriptive statistics shown in table 6.2 to 6.4 indicatd that most of respondents strongly agree in their perception and understanding towards the contributions of their university towards Thailand becoming a KBS. These factors are Governance; Culture; Academic Quality; Innovation; Human Capital; Information and Communication Technology; Research and Infrastructure. From both groups, the average scores from above 7.0 to maximum of 8.36 respectively. Among all the factors from both the group and the combined group, Academic Quality has the highest score of above 8.26. This indicate that most of the respondent agreed on the items of those variables. In addition, the highest standard deviation of Group 1 is Culture at 1.29 and group 2 is Governance at 1.21. In addition the combine data indicates that most of respondents greatly differ in terms of their understanding toward contribution of university towards Thailand becoming a KBS.

6.3.2 Relationship between the Variables

In order to find out the predictability of dependent variables from the independent variables, the researcher carried out the linear regression analysis. Similar to the above analysis, the researcher grouped the respondents in two groups.

1) The first group of the respondents is the faculty members of 9 research universities.

2) The second group is the research staff, doctoral and master students of above universities.

The researcher carried out the nine different regression analysis as shown below from table number 6.5 to 6.13 to test the hypothesis of this study. In addition, the purpose of having nine different regression analyses is to know and find the differences in the perception of two groups of respondents towards the given variables.

The researcher carried out again the multicollinearity statistic to ensure not to harm in analyzing the data. The results show that the Variance inflation factor (VIF) is less than 3. If the VIF is less than 3, there is unlikely of having multicollinearity

and if the VIF statistic is less than 5, there is possibility of multicollinearity. However if the VIF is more than 10, it assured that there is multicollinearity between the variable (Dattalo, 2009; Hoerl & Snee, 2012). In this study, the results (from table 6.5 to 6.13) show that VIF are less than 3. This mean there is no multicollinearity in the statistic.

6.3.2.1 Relationship between the Variables: CON and Independent Variables

The researcher carried out the testing of direct influence of independent variables toward the dependent variable. In this regard, CON is been taken as dependent variable and other eight variables as independent variables. The results are presented below from table 6.5 to 6.8.

1) Relationship between the CON and Independent variables: Group 1.

Table 6.5 shows the result of linear regression analysis predicting the relationship between the dependent and independent variables from the perspective of group 1. There are total of eight items in the variable of CON (see table 4.4), the researcher combined all these items and compute into one variable i.e. CON. Similar technique is also followed for other eight independent variables and run the variable to analyse the relationship between the variables. All the variables are entered to the equation to identify which combinations of the variables best predict indicators for the CON.

Table 6.5 results indicate Contribution of Universities towards Thailand becoming KBS is positively and significantly influenced by HUC (b = .153, p <.001), CUL (b = .118, p <.026), INF (b = .269 p <. 047), ICT (b = .108, p <.049) and ACQ (b 0 .113, <.050). The finding also shows that 44.3 percent variation in Contribution of Universities towards Thailand becoming KBS can be explained by variation in Human Capital, Culture, lnfrastructure and Information and Communication Technology.

Table 6.5 Result of Linear Regression: Predicting (Coefficient) CON* (Group 1: n = 222)

#	Variables	b	Beta	t	P	VIF
1.	HUC	.153	.399	6.319	**.001****	1.582
2.	CUL	.118	.150	2.245	**.026****	1.775
3.	INF	.269	.138	1.999	**.047****	1.898
4.	ICT	.108	.131	1.980	**.049****	1.741
5.	ACQ	.113	.129	1.989	**.050****	2.170
6.	GOV	-.022	-.034	-.466	.642	2.118
7.	INN	.011	.020	.263	.793	2.309
8.	RSH	.013	.004	.084	.933	1.145

Note: R^2 = .443, F (8, 213) = 22.956, p <. 001

*CON: Contribution of University

** Significant Level at 95%

The Human Capital has the highest Beta coefficient (Beta = .399, 9 <.001) comparing wit the beta weight (coefficients) of each variable. Beta coefficients are the coefficient of the independent variables when all variables are stated in standardized.

Hence, it can be interpreted that as per group 1, HUC is the most powerful predictor for Contribution of Universities towards Thailand becoming a KBS followed by CUL, INF, ICT and CUL. In another terms, HUC had the highest degree of influence on the dependent variable.

2) Relationship between the CON and independent variables: Group 2.

The researcher further carried out the linear regression analysis predicting the relationship between the dependent and independent variables from the perspective of group 2. This is shown in the table 6.6.

Table 6.6 Result of Linear Regression: Predicting (Coefficient) CON* (Group 2: n=186)

#	Variables	b	Beta	t	P	VIF
1.	HUC	.140	.323	4.036	**.001****	2.067
2.	CUL	.250	.249	2.858	**.005****	2.453
3.	ACQ	.206	.181	2.003	**.047****	1.960
4.	RSH	.554	.161	2.559	**.011****	1.341
5.	GOV	.044	.073	.916	.361	2.050
6.	INN	-.024	-.048	-.574	.567	2.233
7.	ICT	.037	.045	.601	.549	1.776
8.	INF	.156	.081	.314	.341	2.056

Note: R^2 = .426, F (8, 185) = 18.155, p <. 001

*CON: Contribution of University

** Significant Level at 95%

The CON and the factors term explained a comparatively high (42.6%) as indicated in the above table 6.6. The result demonstrated that overall the linear regression is highly significant (p, <0.001). Among all the independent variables, only four are positively and significantly influence the dependent variable. These influencial variables are HUC (b = .140, p <.001), CUL (b = .250, p <.005), RSH (b = .554, p <. 005), and ACQ (b = .206, p <.047). The HUC has the highest Beta coefficient (Beta = .323, p <.001) comparing the beta weight (coefficients) of each variable.

Thus, it can be interpreted that as per group 2 HUC is the most powerful predictor for Contribution of Universities towards Thailand becoming a KBS followed by CUL, RSH and ACQ.

Furthermore, the table 6.7 summarized the finding from the two groups (Table 6.5 and 6.6) with regards to the significant impact of the independent

variables on dependent variable. The finding from the above two regressions analysis indicates that both the groups perceived that among the eight independent variables, HUC, CUL and ACQ have the significant impact on the Contribution of Universities towards Thailand becoming a KBS.

However, there are **difference in other** variables, the results indicates that:

1) Group 1 perceived that INF and ICT have significant variable impact on the dependent variable.

2) Group 2, perceived that RSH has significant variable impact on the dependent variable.

Table 6.7 Summary of the Significant of Variables (Coefficient) CON*

#	Items	Group 1	Group 2
1.	Significant	✓ HUC ✓ CUL ✓ INF ✓ ICT ✓ ACQ	✓ HUC ✓ CUL ✓ RSH ✓ ACQ
2.	Not Significant	❖ GOV ❖ INN ❖ RSH	❖ GOV ❖ INN ❖ ICT ❖ INF

Note: *CON: Contribution of University towards Thailand Becoming a KBS

3) Relationship between the CON and independent variables of combined Group (Group 1 and 2).

The researcher further combined both the group into one data and carried out the linear regression analysis in predicting the overall relationship between the dependent and independent variables by overall respondents as shown in the table 6.8.

The results indicate Contribution of Universities towards Thailand becoming KBS is positively and significantly influenced by HUC (b = .174, p <.001); ACQ (b = .186, p <.005); CUL (b = .118, p <.012); INF (b = .273, p <.012); RSH (b = .390, p <. 014), and ICT (b = .087, p <.048).

Table 6.8 Result of Linear Regression: Predicting (Coefficient) CON*
(Combined group 1 and 2: n=408)

#	Variables	b	Beta	t	P	VIF
1.	HUC	.174	.425	8.544	**.001****	2.069
2.	ACQ	.185	.135	2.814	**.005****	1.905
3.	CUL	.118	.126	2.528	**.012****	2.094
4.	INF	.273	.122	2.513	**.012****	1.963
5.	RSH	.390	.094	2.470	**.014****	1.224
6.	ICT	.087	.044	1.982	**.048****	1.746
7.	GOV	.022	.030	.608	.543	2.085
8.	INN	.006	.010	.195	.845	2.141

Note: R^2 = .513, F (8, 407) = 54.620, p <. 001

*CON: Contribution of University

** Significant Level at 95%

The CON and the factors term explain a comparatively high (51.3%) as shown in the above table 6.8. The result demonstrated that overall the linear regression is extremely significant (p, <0.001). These variables are HUC; ACQ; CUL; INF; RSH, and ICT. HUC has the highest Beta coefficient (Beta = .425, p <.001) comparing with the beta weight (coefficients) of each variable. This finding indicates that when there is a higher level of HUC, ACQ, CUL, INF, RSH and ICT, there could be higher level of Contribution of Universities towards Thailand becoming a KBS.

This finding is also supported by the scholars such as Human Capital theorist, Psacharopoulos and Woodhall (1997) that knowledge worker results

increase the productivity and has direct impact on the business ability to solve the problem effectively and efficiently. This can be viewed that knowledge worker from the universities could generate economic and social development of Thai and bring the country towards the level of KBS. In addition, investment in human capital could generate and integrate knowledge to improve the activities and benefit the country towards the knowledge society (Babalola, 2003).

6.3.2.2 Relationship Between the ACQ and Independent Variables

The researcher further carried out the testing of influence of independent variables toward the dependent variable. In this regard, "ACQ" is being taken as dependent variable and other variables taken as independent. The researcher grouped the respondents in two groups as carried out in earlier regression.

1) The first group: faculty members of 9 research universities.

2) The second group: Research staff, doctoral and master students of above universities.

The same procedure is followed as earlier regression analysis to analyse the significant relationship between dependent and the Independent variables. The results are presented from table 6.9 to 6.12 as shown below.

1) Relationship between the ACQ and Independent variables: Group 1.

Table 6.9 shows the result of linear regression analysis predicting the relationship between the dependent and independent variables from the perspective of group 1. There are total of six items (see table 4.4) in ACQ variable. The researcher combined all these items and computed into one variable i.e. ACQ. Similar techniques or methods are followed for other seven independent variables and run the variable to analysis the relationship between the variables. All the variables are entered in the equation to identify which combinations of the variables best predict indicators for the ACQ.

Table 6.9 Result of Linear Regression: Predicting (Coefficient) ACQ* (Group 1: n=222)

#	Variables	b	Beta	t	P	VIF
1.	HUC	.080	.247	3.885	**.001****	1.874
2.	CUL	.165	.250	3.743	**.001****	2.068
3.	GOV	.112	.211	3.206	**.002****	2.021
4.	INN	.088	.187	2.696	**.008****	2.696
5.	RSH	.042	.017	345	.731	1.144
6.	ICT	.005	.008	.122	.903	1.879
7.	INF	-.031	-.019	-.276	.783	2.144

Note: R^2 = .524, F (7, 221) = 35.771, p <. 001

*ACQ: Academic Quality

** Significant Level at 95%

ACQ and the factors term explains a relatively high (52.4%) as shown below in table 6.9. The result shows that overall the linear regression is highly significant (p, <0.001). However, among all the independent variables, only four variables are significant out of seven variables. These variables are HUC (b = .080, p <.001), CUL (b = .165, p <.001), GOV (b = .112 p <. 002), and INN (b = .088, p <.008). The HUC has the highest Beta coefficient (Beta = .247, P <.001) comparing with the beta weight (coefficients) of each variable.

Hence, it can be interpreted that HUC variable is most powerful predictor for ACQ as per respondents' group 1 perspective followed by CUL, GOV and INN.

2) Relationship between ACQ and independent variables: Group

The researcher further carried out the linear regression analysis predicting the relationship between the ACQ and independent variables from the perspective of group 2. The regression equation (R^2 = .470, F (7, 185) = 24.407, p <. 001) accounted 47.0% of the variance in the ACQ. Four dependent variables are statistically significant contributing factors.

These are CUL (b = .169, p <. 005), HUC (b =.061, p. < .020), GOV (b = .086, p <.034) and ICT (b = .140, p <. 049). This result indicates that respondent has perceived increase in these factors could enhance the ACQ. Among these variables CUL has the highest Beta coefficient (Beta =. 232, P <.005) comparing the beta weight (coefficients) of each of other variable.

Thus, it can be interpreted that CUL is the most powerful predictor for ACQ. The other three variables are powerful but lesser than CUL. These are HUC, GOV and ICT.

Table 6.10 Result of Linear Regression: Predicting (Coefficient) ACQ* (Group 2: n = 186)

#	Variables	b	Beta	t	P	VIF
1.	CUL	.169	.232	2.824	**.005****	2.348
2.	HUC	.061	.177	2.340	**.020****	2.005
3.	GOV	.086	.162	2.142	**.034****	1.998
4.	ICT	.102	.140	1.980	**.049****	1.738
5.	RSH	.292	.097	1.573	.118	1.322
6.	INN	.034	.078	.981	.328	2.221
7.	INF	.031	.018	.237	.813	2.056

Note: R^2 = .470, F (7, 185) = 24.407, p <. 001)

*ACQ: Contribution of University

** Significant Level at 95%

Furthermore, the table 6.11 summarized the finding of the two groups (Table 6.9 and 6.10) in regards to the significant impact of the independent variables on ACQ. The finding from the above two regressions analysis indicates that there is slightly difference in understanding of the two groups towards the independents variables impacts on the dependent variable.

1) As per group 1, HUC variable is most powerful predictor for ACQ.

2) According to Group 2, CUL is most powerful predictor for ACQ.

However, the common variables are HUC, CUL and GOV, which have significant impact on the ACQ. In addition, other differences are as follows:

1) From the faculty perspective **INN** also has significant variables impact on the university ACQ.

2) The second group perceived **ICT** also significantly influences on the university ACQ.

Table 6.11 Summary of the Significant of Variables (Coefficient) ACQ*

#	Items	Group 1	Group 2
1.	Significant	✓ HUC	✓ CUL
		✓ CUL	✓ HUC
		✓ GOV	✓ GOV
		✓ INN	✓ ICT
2.	Not Significant	❖ RSH	❖ RSH
		❖ ICT	❖ INN
		❖ INF	❖ INF

Note: *ACQ: Academic Quality

3) Relationship between the ACQ and independent variables: Combined group (group 1 and 2).

The researcher further combined both the group into one data and carried out the linear regression analysis in predicting the relationship between the dependent and independent variables by overall respondents as shown in the table 6.12.

Table 6.12 illustrated that the ACQ and the factors term explains a comparatively high (49.6%). The result shows that overall the linear regression is extremely significant (p, <0.001). However, among all the independent variables, only five variables are significant out of seven variables. These variables

are CUL (b = .164, p <.001); GOV (b=.106, P <.001); HUC (b = .053, p <.001); INN (b = .054, p <.017); and RSH (b = .239, p <. 046). The CUL has the highest Beta coefficient (Beta = .240, p <.001) when comparing the beta weight (coefficients) of each variable. This indicates that CUL is most powerful variables that influence ACQ of research universities followed. This indicates that stronger the culture better the academic quality.

Table 6.12 Result of Linear Regression: Predicting (Coefficient) ACQ*
(Combined Group 1 and 2: n = 408)

#	Variables	b	Beta	t	P	VIF
1	CUL	.164	.240	4.600	**.001****	2.196
2	GOV	.106	.200	4.022	**.001****	2.004
3	HUC	.053	.177	3.559	**.001****	2.006
4	INN	.054	.123	2.407	**.017****	2.108
5	RSH	.239	.079	2.006	**.046****	1.264
6	ICT	.048	.069	1.468	.143	1.789
7	INF	.026	.016	.309	.757	2.068

Note: R^2 = .496, F (7, 407) = 58.213, p <. 001)

*ACQ: Contribution of University

** Significant Level at 95%

6.3.2.3 Relationship Between the ICT and Independent Variables

The researcher further carried out the test regarding influence of independent variables toward the ICT. In this regard, “ICT” is been taken as dependent variable and other variable as independent variables. The researcher grouped the respondents in two groups as carried out in earlier regression.

1) The first group: faculty members of 9 research universities.

2) The second group: Research staff, doctoral and master students of above universities.

The same techniques are followed as earlier regression analysis to analyse the significant relationship between ICT and the Independent variables. The results are presented from table 6.13 to 6.15 as shown below.

1) Relationship between ICT and Independent variables: Group 1.

There are total of eight items (see table 4.4) in the variable of ICT, the researcher combined all the eight items and computed one variable i.e. ICT. All the six Independent variables and the dependent variable are entered in the equation to identify which combination of the variables best predicts indicators for the ICT.

The result shows that overall the linear regression is highly significant (p, <0.001). The regression equation (R^2 = .451, F (7, 221) = 26.981, p <. 001) accounted 45.1% of the variance in ICT. Table 6.13 result shows that among seven independent variables, only four variables are significant. These variables are INF (b = .576, p <.001); INN (b = .141, p <.006); GOV (b = .138, p <. 013); and CUL (b = .146, p <.001). The INF has the highest Beta coefficient (Beta = .244, P <.001) when comparing the beta weight (coefficients) of each variable.

Thus, it can be interpreted that INF variable is most powerful predictor for ICT as per respondents group 1 and others are INN, GOV and CUL.

Table 6.13 Result of Linear Regression: Predicting (Coefficient) ICT*
(Group 1: n=222)

#	Variables	b	Beta	t	P	VIF
1.	INF	.576	.244	3.451	**.001****	2.003
2.	INN	.141	.207	2.782	**.006****	2.229
3.	GOV	.138	.179	2.510	**.013****	2.057
4.	CUL	.146	.152	2.075	**.039****	2.160
5.	ACQ	.013	.009	.122	.903	2.170
6.	HUC	.006	.013	.179	.858	2.006
7.	RSH	.194	.055	1.038	.300	1.139

Note: R^2 = .451, F (7, 221) = 26.981, p <. 001

*ICT: Information and Communication Technology

** Significant Level at 95%

2) Relationship between ICT and Independent variables: Group 2.

The researcher further carried out the linear regression analysis predicting the relationship between the ICT and independent variables from the perspective of group 2. Table 6.14 indicates that the regression equation (R^2 = .415, F (7, 185) = 19.743, p <. 001) accounted 41.50% of the variance in the ICT variable. The result shows that overall the linear regression is highly significant (p, <0.001). From all the independent variables, only three variables are significant. These variables are INF (b = .576, p <.001), HUC (b = .038, p <.001) and ACQ (b = .211, p <.049). The INF has the highest Beta coefficient (Beta = .287, P <.001) comparing the beta weight (coefficients) of each variable.

Hence, it can be interpreted that as per that the INF variable is most powerful predictor for ICT as per respondent's group 2 perspectives.

Table 6.14 Result of Linear Regression: Predicting (Coefficient) ICT*
(Group 2: n=186)

#	Variables	b	Beta	t	P	VIF
1.	INF	.576	.287	3.687	**.001****	1.910
2.	HUC	.078	.167	2.093	**.038****	2.017
3.	ACQ	.211	.154	1.980	**.049****	1.918
4.	GOV	.084	.116	1.449	.149	2.026
5.	INN	.031	.051	.610	.543	2.229
6.	CUL	.035	.035	.399	.691	2.451
7.	RSH	.088	.021	.328	.743	1.340

Note: R^2 = .415, F (7, 185) = 19.743, p <. 001

*ICT: Information and Communication Technology

** Significant Level at 95%

The finding from the above two group (table 6.13 and 6.14) are summarized in Table 6.15. The finding from two regressions analysis indicates that there is one common variable, where both the respondents perceived same thing i.e. INF. There are differences in the perspectives from the two groups towards other independents variables those impacts on the dependent variable.

According to Group 1, INN, GOV, and CUL are other significant variables predictor for ICT.

According to Group 2, HUC and ACQ variables are predictor for ICT.

Table 6.15 Summary of the Significant of Variables (Coefficient) ICT*

#	Items	Group 1	Group 2
1.	Significant	✓ INF ✓ INN ✓ GOV ✓ CUL	✓ INF ✓ HUC ✓ ACQ
2.	Not Significant	❖ ACQ ❖ HUC ❖ RSH	❖ GOV ❖ INN ❖ CUL ❖ RSH

Note: * ICT: Information and Communication Technology

3) Relationship between the ICT and independent variables: Combined group (group 1 and 2).

Similar technique is applied to run the linear regression analysis in predicting the relationship between ICT and independent variables for overall respondents as shown in the table 6.16. Five independent variables contributed significantly to predicting the ICT. These five variables are INF (b = .665, p <. 001); GOV (b=.124, P <.002); CUL (b=.156, P <.005), INN (b=.071, P <.045), and HUC (b = .049, <.033).

Table 6.16 Result of Linear Regression: Predicting (Coefficient) ICT* (n=408) (Combined Group 1 and 2: n = 408)

#	Variables	**b**	**Beta**	**t**	**P**	**VIF**
1.	INF	.655	.278	5.359	**.001****	1.929
2.	GOV	.124	.164	3.139	**.002****	1.958
3.	CUL	.127	.129	2.350	**.019****	2.166
4.	INN	.074	.118	2.191	**.029****	2.083
5.	HUC	.049	.112	2.139	**.033****	1.983
6.	ACQ	.111	.077	1.464	.144	2.009
7.	RSH	.077	.018	.423	.673	1.263

Note: R^2 = .433, F (7, 407) = 52.717, p <. 001

*ICT: Information and Communication Technology

** Significant Level at 99%

Among these seven variables, INF has the highest Beta coefficient (Beta =.278, P<.001) when comparing the Beta weight (coefficients) of other variable. Thus, it can be interpreted that INF is the most powerful predictor for ICT followed by GOV; CUL; INN; and HUC. The other variable is powerful but lesser than the INF.

The results of the nine regression analysis are summarized in Table 6.17, with those variables that are statistically significant predictors of each of variables.

Table 6.17 Summaries of Statistically Significant Predictors of Dependent Variables

#	Independent Variables	Dependent Variables								
		CON			ACQ			ICT		
		G 1	G2	G1+G2	G 1	G2	G1+G2	G 1	G2	G1+G2
1	HUC	.399**	.323**	.425**	.247**	.177**	.177**	NS	.167**	.112**
2	CUL	.150**	.249**	.126**	.250**	232**	.240**	.152**	NS	.129**
3	INF	.138**	NS	.122**	NS	NS	NS	.244**	.287**	.278**
4	ICT	.131**	NS	.044**	NS	.140**	NS	-	-	-
5	ACQ	129**	.181**	.135**	-	-	-	NS	.154**	NS
6	GOV	NS	NS	NS	.211**	.162**	.200**	.179**	NS	.164**
7	RSH	NS	.161**	.094**	NS	NS	.079**	NS	NS	NS
8	INN	NS	NS	NS	.187**	NS	.123**	.207**	NS	.118**

Note: G1: Group 1, G2: Group 2; Comb: Combine G1 & G2

** Significant, p <. 001, NS : Not Significant

The study appears to confirm a positive and significant relationship between the independent and dependent variables. To test the three hypotheses of this study, path model is used. The detail analysis of each variable is also computed and explained in next step under the heading of casual relationship among variables.

6.3.3 Casual Relationship among the Variables.

From the linear regression results, causal relationships among variables have been computed by using path analysis. The casual relationships are explained as direct and indirect effects. These effects of the variables affecting the CON towards Thailand becoming a KBS are computed and summarized in Table 6.18. The indirect causal relationships are calculated as follow.

1) For Group 1

HUC → ACQ → CON: .247 x .129=.031

GOV→ ACQ → CON + GOV→ ICT→ CON: (.211 x .129) + (.179 +.131)=.050

CUL→ ACQ → CON + CUL→ ICT→ CON: (.250 x .120) + (.152 +.131)=.051

INN → ACQ→ CON + INN→ ICT→ CON: (.187 x .120) + (.207 +.131)=.051

INF → ICT→ CON: .244 x .131=.031

2) For Group 2

HUC→ACQ→CON:+HUC→ICT→ACQ→CON:

(.177x.181)+(.167x.154x.181)=.008

GOV→ ACQ → CON: .162 x .181=.029

CUL→ ACQ → CON: .232 x .181=.041

INF → ICT→ CON: .287 x .131=.007

3) Combined Group

HUC → ACQ → CON+ HUC→ ICT→ CON: (.177 x .135) + (.122+.044)=.028

GOV→ ACQ → CON + GOV→ ICT→ CON: (.200 x .135) + (.164+.044)=.034

CUL→ ACQ → CON + CUL→ ICT→ CON: (.240 x .135) + (.129+.044)=.037

RSH → ACQ→ CON: .079 x .135=.010

INN → ACQ→ CON + INN→ ICT→ CON: (.123 x .135) + (.188+.044)=.024

INF → ICT→ CON: .278 x .044=.012

Table 6.18 Direct, Indirect and Total Casual Effects of Independent Variables

#	Contribution of University: Sources of Causation											
	Independent Variables	**Direct**	**Indirect**	**Total**	**Independent Variables**	**Direct**	**Indirect**	**Total**	**Independent Variables**	**Direct**	**Indirect**	**Total**
	Group 1				Group 2				Combine Group			
1.	HUC	.399	.031	.430	HUC	.322	.008	.330	HUC	.425	.028	.453
2.	CUL	.150	.051	.201	CUL	.249	.042	.291	CUL	.126	.037	.163
3.	INF	.138	.031	.169	ACQ	.181	-	.181	ACQ	.135	-	.135
4.	ICT	.131	-	.131	RSH	.161	-	.161	INF	.122	.012	.134
5.	ACQ	.129	-	.129	GOV	-	.029	.029	RSH	.094	.010	.104
6.	INN	-	.051	.051	INF	-	.007	.007	ICT	.044	-	.044
7.	GOV	-	.050	.050	ICT	-	.027	.027	GOV	-	.034	.034
8.	RSH	-	-	-	INN	-	-	-	INN	-	.024	.024

As per Group 1, the contribution of university towards Thailand becoming a KBS is directly and positively affected or influenced by Human Capital, Culture, Governance, Infrastructure, ICT and Academic Quality. Innovation and Governance variables indirectly influence the contribution of universities towards Thailand becoming KBS. The result shows that Reseach variable has no significant impact on the Contrubtion of University as shown in the above table 6.18.

As per group 2, the contribution of university towards Thailand becoming a KBS is directly and positively affected or influenced by Human Capital, Culture, Academic Quality and Research. Governance, Infrastructure, and ICT variables indirectly influence the contribution of universities towards Thailand becoming KBS. The result also indicates that Innovation variable has no significant impact on the Contrubtion of University as shown in the table 6.18.

As per combined group (1 and 2), results shows that the contribution of university towards Thailand becoming a KBS is directly and positively affected or influenced by Human Capital, Culture, Academic Quality, Infrastructure, Research and ICT. Governance and Innovation variables indirectly influence the contribution of universities towards Thailand becoming KBS as shown in the above table 6.18.

The researcher further carried out three path analysis as shown in figure 6.6 to 6.8. The application of the path analysis to test the hypothesis yields results in the path diagram presented in the figure 6.6.

This path diagram is derevied from the summaried table 6.17. The path model provided some additional insight about the independent variables. Path coefficient of this model was calculated by nine regression analysis (see table 6.5 to 6.16). Path analysis was conducted to identify a casual pattern of these variables and support for another two hypotheses (2 and 3) of this study. The researcher carried out path analysis of first combined group to test hypothesis (2 and 3) of this study. Path analysis derived the table 6.17.

Path models indicates that the respondents perceived that Contribution of their University enables information creation as well as helps Thai people prosper in their life: Enhance quality of life. The respondent's notions that their university uses and shares the knowledge to improve the general wellbeing of the people as well create and share knowledge. University also provides opportunities to the public and helps Thai people to prosper in their life. They are also satisfied with of creation of human capital through education provided by the university as well as knowledge gained from university aims to fulfil sufficiently for societal needs.

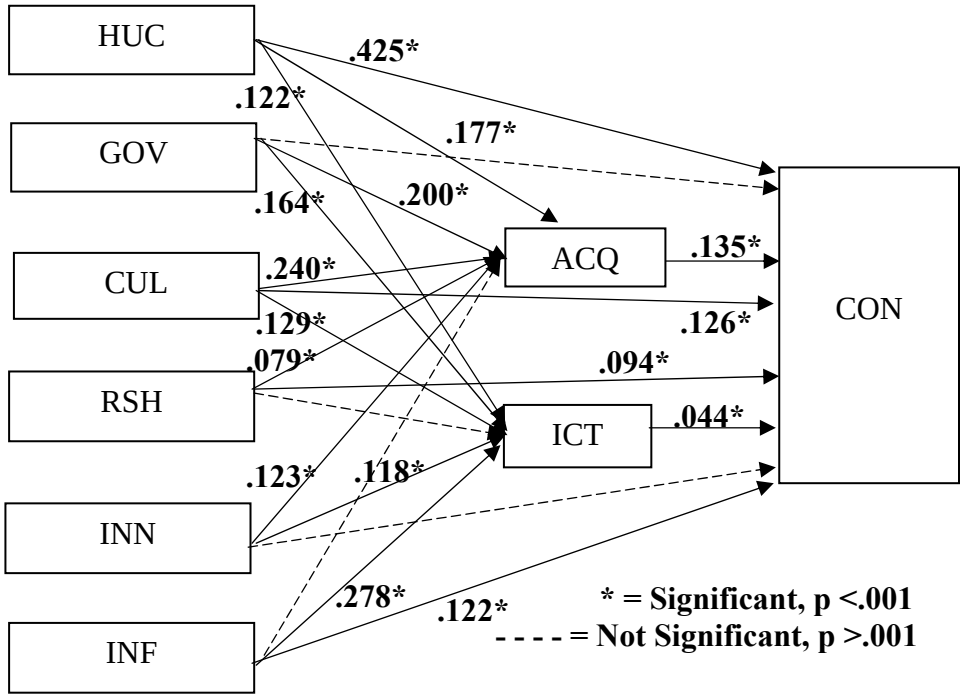


Figure 6.6 Casual Relation between Independent and Dependent Variable
Path Model Coefficient (Combined Group)

The figure 6.6 shows that the contribution of university of towards Thailand becoming a KBS is directly and positively affected or influenced by Human Capital, Culture, Academic Quality, Infrastructure, Research and ICT. Governance and Innovation variables indirectly influence the contribution of universities towards Thailand becoming KBS as shown in the figure 6.6.

The path model confirmed that there is positive and significant relationship between independent variables and dependent variable. The results from the statisitical analysis shows (Table 6.17 and figure 6.6) that Human Capital, Governance, Culture, Research, Innovation and Infrastructure, Academic Quality and ICT have direct significant influence on contribution of university towards Thailand becoming a knowledge based society. This indicates that higher level of contribution of these variables lead to higher university contribution towards Thailand becoming a knowledge based society.

Thus the results show that the hypothesis (1) direct influence of independent variables to dependent variable is accepted.

In addition, the results from the statisitical analysis shows (Table 6.17 and figure 6.6) that Human Capital, Governance, Culture, Research, Innovation and Infrastructure have indirectly significant influence on contribution of university towards Thailand becoming a knowledge based society through Academic Quality. This indicates that higher level of contribution of these variables lead to higher university contribution towards Thailand becominga knowledge based society through academic quality.

Thus the results show that the hypothesis (2) indirect influence of independent variables to dependent variable is accepted.

Furthermore, The results from the statisitical analysis shows (Table 6.19 and figure 6.6) that Human Capital, Governance, Culture, Research, Innovation and Infrastructure have indirect significant influence on contribution of university towards Thailand becoming a knowledge based society through Information and Communication Technology. This indicates that higher level of contribution of these variables, there is higher level university contribution towards Thailand becoming a knowledge based society through ICT.

Thus the results show that the hypothesis (3) indirect influence of independent variables to dependent variable is accepted.

Furthermore, the researcher compared interrelationship among variables in two groups of respondents. The data obtained from the total sample in the survey were separated based on the group into two sets: faculty members and research staff, doctoral and master students. The path analysis was conducted on the two sets of data. The following figure 6.7 and 6.8 present the results of path analysis for the two data sets: Group 1 and Group 2.

Figure 6.7 shown below indicates that as per Group 1, the contribution of university of towards Thailand becoming a KBS is directly and positively affected or influenced by Human Capital, Culture, Governance, Infrastructure, ICT and Academic Quality. Innovation and Governance variables indirectly influence the contribution of universities towards Thailand becoming KBS. The result shows that Research variable is not significant impact on the Contribution of University.

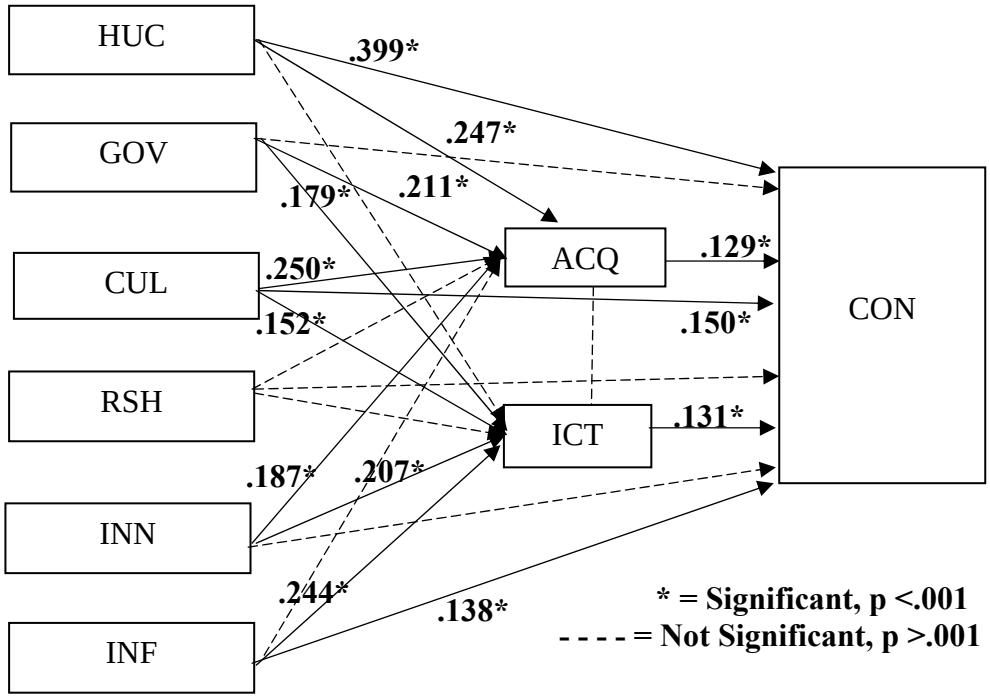


Figure 6.7 Casual Relation between Independent and Dependent Variable Path Model Coefficient (Group 1)

As per group 2, the contribution of university towards Thailand becoming a KBS is directly and positively affected or influenced by Human Capital, Culture, Academic Quality and Research. Governance, Infrastructure, and ICT variables indirectly influence the contribution of universities towards Thailand becoming KBS. The result also indicates that Innovation variable has no significant impact on the Contrubtion of University as shown in the figure 6.8.

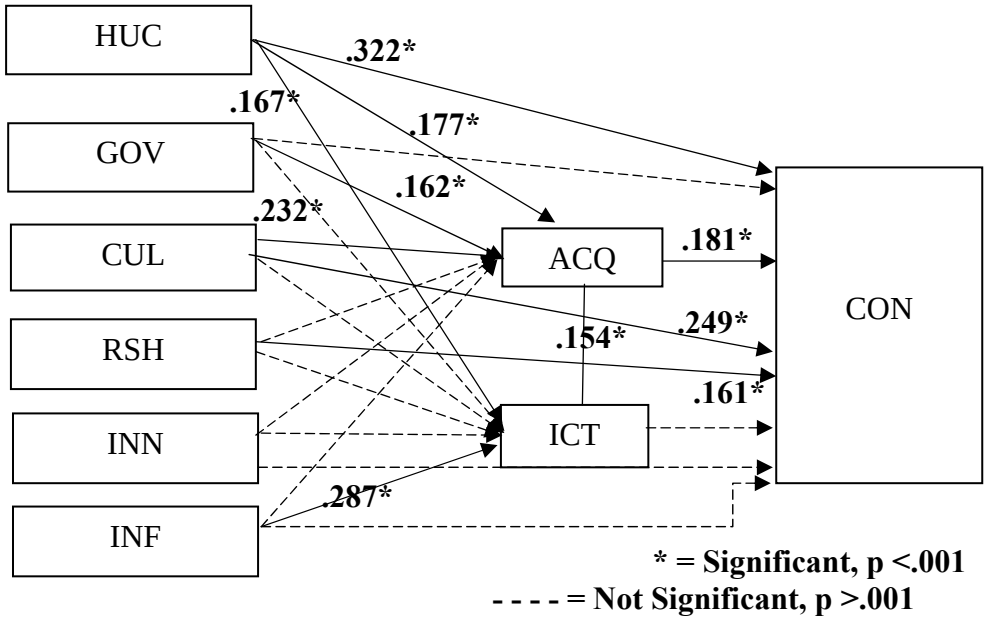


Figure 6.8 Casual Relation between Independent and Dependent Variable Path Model Coefficient (Group 2)

The researcher carried out further analysis to find the causal relationship between each independent variable with dependent variable. Purpose of this analysis is to know perception of the respondents insightfully.

6.3.3.1 The Relationship between Human Capital and Contribution of University

The relationship were such that the higher the perception and understanding scores on the factors the more respondents outlook on the impact of Human Capital towards the Thailand becoming knowledge based society. This indicates the universities should consider more on producing the human capital with better competency, skilled graduates with knowledge. The higher skill gains from the university have the potential to raise the human capital and universities are encouraged close interaction and transmission of knowledge between teacher and learner. Thus the knowledge gained from the university's emphasie on the knowledge creation and aims to fulfil to have sufficiently for societal needs.

Human capital variable indicated that the respondents perceived and understand that this variable is directly and indirectly influence the contribution of

universities towards Thailand becoming a KBS. Table 6.17 shows that HUC variable has the highest Beta coefficient (Group 1: Beta =.399, p <. 001; Group 2: Beta =.323, p <.001; and Combine Group: Beta = .425, p <.001) among all the variables in regards to the direct influence. It has Beta (Group 1: Beta =.031, p <. 001; Group 2: Beta =.008, p <.001; and Combine Group: Beta = .028, p <.001) indirect influence through ACQ and ICT on Contribution of University toward Thailand becoming a KBS as shown in table 6.18.

The results show that the respondents believe that the competency, skill and knowledge have each attributed to the success of nine Thai research universities' contribution towards Thailand becoming knowledge society. This indicates that respondents perceived that competency, knowledge and skill are the influencing factor of human capital that could contribute moving the country towards KBS. In regards competency, respondents perceived that capacity (absorb knowledge; ability to develop) and capability (implementing and transforming the knowledge for the betterment of society) of the knowledge worker could boost the country towards KBS (Whiddett & Hollyforde, 1999; Minbaeva & Michailova, 2004; Guzman & Wilson, 2005; Beerel, 2009; Fabbris et al., 2011). In regards to skills, respondents perceived that generic, technical and academic skill could influence contributions of university towards the KBS (Sanghai, 2007; Bridgstock, 2009). In regards to the knowledge, respondents perceived that tacit and explicit knowledge play an importance and this could be emphasizing and focusing on knowledge creation that could fulfil sufficient needs of societal need. Also, university could transmit systematic knowledge that can be shared jointly (Nonaka & Takeuchi, 1995; Collins, 2010; Ozmen, 2010).

The result confirmed with the qualitative finding that knowledge, skill and competency play an important role for Thailand to be a knowledge society. In this regards, result suggested that the research universities needs to gear more focus on levelling up their faculty members to be more up to date needs of the country development as well as clear understanding of university contribution towards KBS.

This finding is also supported by the qualitative result that 9 research universities played significant role in producing the human capital for the country development and bringing its own nation towards KBS. Previous study also agreed on

this that the accumulation of human capital through universities is the major sources of sustainable development of the country and bringing its own nation towards KBS (Douangngeune et al., 2005; Brempong et al., 2006; Hanushek & Woessmann, 2008).

6.3.3.2 The Relationship Between Governance and Contribution of University

In regards to the Governance, path analysis indicates some insights. The results shows that that Governance does not influence directly towards contribution of universities of Thailand becoming a KBS. However, it has indirect influence through ACQ and ICT. The finding shows that respondents perceived and understand that it is indirectly through ACQ and ICT (Group 1: Beta =.050, p <. 001; Group 2: Beta =.029, p <.001; and Combine Group: Beta = .034, p <.001) influence in regards to the contribution of universities toward Thailand becoming a KBS (see table 6.18).

The findings from the above results indicate that the respondents believe that the Governance: accountability and transparency have each attributed to the success of 9 Thai research universities' contribution towards Thailand becoming knowledge society through Academic Quality and ICT. The result is inveterate with the qualitative finding that governance factors play an important role in the university in regards to their contribution towards Thailand to becoming a knowledge society. This suggested that Research University needs to be accountable in their governance as well as transparency especially in regards to the academic quality and usage of ICT.

This result indicates the respondents perceived that university governance play a vital role with a proper accountability and transparency (Shiroyama, 2001; Dunn, 2003; Hood et al., 2004; Leveille, 2006; Liu, 2011). Accountability in terms of shared governance is (Romzek, 2000; Heaney, 2010) by allowing external and internal stakeholders to participate in decision making over important internal matter (Goedegebuure et al., 1990; Sporn, 2003; Burke, 2004 and 2005). At the same time, faculty and students could have their voice in university's governance structure (Kovac et al., 2003; Menon, 2003). In regards to the transparency, respondents perceived that universities having its own strategic plan for development and also systematic information to monitor the activities as transparency is the driving principle in managing the university (Pagano and Pagano, 2003; Bennis et al., 2008).

This finding is also supported by the experts (qualitative method) that clear transparency and accountability in governance could influence the graduates (knowledge workers) in the future endeavor as these knowledge worker are the future leader of the country. Learning from the governance system during their study period at university could influence in their career when they began their career either in public and private organization.

6.3.3.3 The Relationship between Culture and Contribution of University

In regards to Culture, the results show that the respondents perceived that their university aim of education is to develop individuals' full potential as well provide rich learning experience for its students. The path modal indicates that the Culture variable directly (Group 1: Beta =.150, p <. 001; Group 2: Beta =.249, p <.001; and Combine Group: Beta = .126, p <.001) and indirectly through ACQ and ICT (Group 2: Beta =.027, p <.001) influence the contribution of university towards Thailand becoming a KBS as shown in table 6.17 and 6.18 respectively. They also believe that their university creates an environment where knowledge workers can develop the ethical commands with parity to mental development as well as provides platform to learn the value of different belief and culture as well as different norms. Universities also need to provide the scholarly atmosphere where scholar could contribute and implement ideas for the country development.

The finding of the qualitative method is also encouraging. Though the research universities are yet to have the culture of fully luring the knowledge workers to research focus, experts believe that creating and enhancing the culture of research atmosphere universities could bring in the future knowledge workers to further sharpen their knowledge in research activities. This will further strengthen in reducing the gap between knowledge provider and receivers in understanding the knowledge gap in the particular field of study as well as understanding of the university direction towards bringing nations towards KBS.

6.3.3.4 The Relationship Between Research and Contribution of University

Path analysis also provided the insight in regards to the Research variable. Research variable influence directly (Group 2: Beta =.161, p <.001; and Combine Group: Beta = .094, p <.001) and indirectly (Combine Group: Beta = .010, p

<.001) through ACQ and ICT to the dependent variable. Respondents perceived and understand that the research through university creates an opportunity not only for the individual but also for industry, region and country. At the same time university research activities help local business and communities to develop new product and services. The investment in research creates new product and new intellectual property. Similarly, respondents perceived that university research create and generate new knowledge area (Grinnell, 1997; Shapira et al., 2006; Vest, 2007). This finding is supported by qualitative data of this study (pp.146-150), that research is one of the pillars of university and 9-research University producing different type of research to benefit the country.

In addition, research universities have the better capabilities and capacities producing potential researchers for the country development that leads country towards KBS. However, experts argued that research universities needs to introduce inter-disciplinary research approach to train the future knowledge workers to cope and challenge the dynamism of the global competitiveness. In this context, State and Industry play important role in facilitating the proper research funding for future human capital of Thailand.

6.3.3.5 The Relationship between Innovation and Contribution of University

The path model indicates that this variable is significantly influenced indirectly through ACQ and ICT (Group 1: Beta =.051, p <. 001; and Combine Group: Beta = .024, p <.001**)** in regards to the contribution of university towards Thailand becoming a KBS. This reveals that technology and teaching innovation as well the program innovation from the universities' could contribute for the nation to move towards KBS. This suggests that the university need to allow their faculty to team with industry for the technology innovation as well as provide the platform for innovation with the support from industry.

Respondents perceived that university decision makers could plan and strategize the technology teaching innovation at university. At the same time, university degree offer needs to be innovative and design innovative program for the future knowledge worker. In addition, university education needs to ready itself for the solving the practical problem. (Drucker, 1993; Bonauti, 2003; Arthur & Bohlin, 2005; Vest, 2007; Wall & Ryan, 2010; Workman, 2010).

One of the items is loaded separately with loading of .891 and is not grouped with above two components. This item believed to be very important, where university decision maker need to review and seriously consider their practices and the attitudes in regards to university operation. The item read, as “University is unwilling to change attitudes and practices this is an obstacle for innovation”,.

The respondents considered that the Innovation factors on its own attributed to the success of 9 Thai research universities’ contribution towards Thailand becoming knowledge society. The result is supported with the qualitative finding that innovation factors play an important role in the university. In this regards, result suggested that the research universities need an innovative degree program to fulfil the needs of knowledge workers. At the same time curriculum innovation is crucial for educators to adapt and develop expert teaching and learning activities. Universities do need to develop new program such as professional degrees which are innovative and design for knowledge workers. At the same time knowledge workers could be benefited from the programs offered by university. This will inspire knowledge workers to be ready for the practical world.

6.3.3.6 The Relationship between Infrastructure and Contribution of University

From the path model indicates that the Infrastructure variable directly (Group 1: Beta =.138, p <. 001; and Combine Group: Beta = .122, p <.001) and indirectly through the variable of ACQ and ICT (Group 1: Beta =.031, p <. 001; Group 2: Beta =.007, p <.001; and Combine Group: Beta = .012, p <.001) influenced the contribution of university towards Thailand becoming a KBS. Respondents perceived and understand that university needs to ensure to have adequate availability, facilities of scientific, and operation infrastructure for their knowledge worker. At the same time university needs to have sufficient funding for new research project that could help the contribution of university in building a nation toward KBS (Kettinger, 1994; Chapman, 2006; Yusuf & Nabeshima, 2007; Pero, 2011).

Respondents believed that Infrastructure is highly correlated in regards to the contribution of university toward the Thailand becoming a knowledge society. The respondents considered that the Infrastructure factors have its own ascribed to the

success of 9 Thai research universities' contribution towards Thailand becoming knowledge society.

The result is supported with the qualitative finding that **Infrastructure** factor play an important role in the university in regards to their contribution towards Thailand to becoming a knowledge society. In this regards, result suggested that the research universities must supply the basic requirement for the operation infrastructure such as digital library; research database; access to different Internet sources. In terms of facility infrastructure, research universities present its physical infrastructure in the aesthetic social and culture aspects of institutional culture at the same time fully supporting to the needs of university stakeholder i.e. faculty members, students and research staff. In the context of scientific infrastructure, the universities must upgrade and maintain its research instruments and lab for the upcoming new knowledge workers. At the same time university must ensure proper access to require knowledge to the new knowledge workers.

6.3.3.7 The Relationship Between Academic Quality and Contribution of University

Path model indicates that Academic Quality (Beta= .129; p <. 001) has direct influence on contribution of university toward Thailand becoming a KBS. This revealed that Thai research universities academic quality is continually improving and are systematic and structured. Respondents believe that their university safeguard the social interest but not negotiate in maintaining the standard of academic quality. In addition, respondents perceived that academic quality is guided by improvement driven approach to meet the international or global standard (Vroeijenstijn, 1995; Woodhouse, 1999; Santiago et al., 2008).

From the qualitative approach, the experts also agreed on the academic quality as another main factor that push nation towards KBS. In this regards, focus need to be on upgrading the quality of teaching faculty which impact directly to the future students and knowledge workers in their learning and enhancing their capacity and capability in contributing nation towards KBS.

6.3.3.8 The Relationship Between ICT and Contribution of University

ICT influence (Beta = .004; p <. 001) on the contribution of universities toward Thailand becoming a KBS. This indicates that respondents perceived ICT as

significant factor and could be regarded as tools or instrument. Respondents perceived and understand that the ICT is helping in improving the university curriculum and helps in improving the quality of educational achievement as well as reforms in university. Respondents perceived that ICT facilities are adequate in their university, it is continually upgraded, and it enhances their employability as well as diversify in their learning skills.

This finding is somewhat similar to the finding of the qualitative data, where experts viewed that ICT could be instrument to empower the knowledge workers to learn and lead the society towards KBS. Experts do believe that proper utilization of ICT facilitate the transfer to the knowledge, which could enhance the country competitiveness in the global market. However, experts also believes that the universities in Thailand tend to have mismatch between the demand and supply.

6.4 Summary

The respondents of this study are the faculty members, research staff, doctoral and master students from 9 Thai research universities. 51 percent of the respondents are female and 49 percent are the male. 38 percent of the respondents are from age group from 31 to 40 and 27 percent of the respondents are from 21 to 30. 23 percent of the respondents are in the group of 41 to 50 year old group**.**

The study carried out three Pearson correlation in calculating and examining the inter relationship between dependent and independent variables and found them positively correlated. Furthermore, nine linear regression analyses were run to observe the significant relationship between the independent and dependent variables. The purpose of having three different correlations and nine linear regressions is to analyse and compare the differences among the two groups of respondents (group 1: Faculty members and group 2: Research staff, doctoral and master students) in their perception and understanding towards the given variables.

The study appears to confirm a positive and significant relationship between the independent and dependent variables. The results of the nine regression analysis show that the variables are statistically significant predictors of each variable. From the regressions result, casual relations among variables have been computed by using the path analysis.

Human Capital, Governance, Culture, Innovation and Infrastructure contributed significantly to predicting the importance to the Academic Quality, ICT and the Contribution of University towards Thailand becoming a KBS. The Research variable is significant predictor of the Academic Quality. Human Capital variable is direct significant predictor and Contribution of University and is also to Academic Quality. The Infrastructure variable is significant predictor of ICT and direct significant predictor of Contribution of University towards Thailand becoming a KBS. Academic Quality and ICT variables are direct significant predictor of dependent variable

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

This chapter addresses the conclusion and recommendations of this study. Based on the analysis presented in Chapter V and VII, several conclusions is drawn and presented below. This chapter also includes the contribution of this study toward policy makers or policy implementer as well as for the decision makers.

7.1 Conclusions

Universities play a major role in producing knowledge workers and they are core and the main pillar in moving the nation towards KBS. At the same time, there are demands that universities be more accountable to society. Traditionally, the role of Thai universities was to provide civil servants for specific government department. However, over the period, Thai universities have been serving the entire sector: private, public, or non-government organizations. Their contribution towards country development is immense. With the new government, policy in regards to lifting or leapfrogging Thailand toward KBS, universities are playing a lead and major role in this regard and State has specifically supported in this policy by grouping the Thai universities in four categories. Among these four categories, research universities are the leading institutions and supporting the government policy in regards to building the nation towards KBS.

This study applied qualitative and quantities approach to explore the concept of KBS in the context of Thailand and the contribution of universities towards Thailand becoming a KBS. Purposes of applying these two methods are complimented by the qualitative and quantitative method.

Under the qualitative approached, the researcher interviewed 31 experts, who are involved in the higher education sectors. These experts are either policy makers or decision makers or implementer of the government policy or reporters on higher

education sector. In regards to the quantitative approach, researcher carried out the survey and requested faculty members and research staff as well as the students (doctoral and master students) of nine research universities to complete the research survey.

Based on the finding from the Chapter 5 and 6, the concept of KBS in the context of Thailand can be explained as 'enhancing the quality of Thai people's life through university's teaching, research, training and development by raising overall the country performance by using knowledge as the property of the country. Also, proper understanding about democracy capability and how to earn living with the good morals and ethics plus the ability to think innovatively and applying basic knowledge to the real world and issues of real world situations'. This explaination is similar to the definition of knowledge society given by different scholars (Bell, 1973; Santiago et al., 2008; Sharma et al., 2008a; Melnikas, 2010).

Universities are the key driving force in producing the elites or knowledge workers of the next generation and also inculcate values in the students and the researcher. University creates the opportunity not only for the individuals but also for industry, region and the country. Study found that Thai research universities have three different levels of a research body in their universities: center of excellences; center of innovation; and center of development. To carry out different research activities for the benefits of the society. Research Universities are capable of doing research and government encouraged the universities to raise the research competency of knowledge workers. In addition, university's accountability and transparency attributed to the accomplishment of research universities' contribution towards Thailand becoming knowledge society.

The finding shows that the high degree university competence and university compliance could leverage and leapfrog the country to graduate from middle class country towards developed countries. In this regards, especially the Thai research universities play a significant role in bringing up itself from the developing country toward develop countries.

The study found that the university mandate is to prepare the workforce or knowledge workers to be ready for the labour market to enter both private and public sectors. University facilitates analysis thinking and problem solving in general but key

lies with how a problem is solved and how interaction takes place within different environment. However, it is desirable that the university have enough budget, enough facilities, database, infrastructure, time to conduct research and encourage faculty member not just to teach but also provide research for the betterment of the society and the country as a whole. The study found that that universitie's new products or fresh knowledge workers are not so efficient to meet the industry needs due to lack of skill, knowledge and competency. In addition, lack of expertise in the universities failed to provide those required knowledge to the industry or society to the community.

The finding shows that higher level of human capital, academic quality, research and innovation led to higher level of contribution of university towards Thailand becoming a KBS. This finding is in line with other scholar such as Psacharopoulos and Woodhall (1997), who indicate that the knowledge workers increase the country productivity as well direct impact on the organization, institutions, or firms in ability to solve the problem effectively and efficiently. Human capital is being the most influential factor, universities stimulate and nurture the knowledge workers to be fully productive for the country development and lift the country towards KBS. This finding supports other scholars view that the buildup of the human capital through universities is one of the main foundations of the country development to impetus its own nation towards KBS (Booth, 1999; Bontis, 2004; Goldstein & Renault, 2004; Kirchsteiger & Sebald, 2009; UNDP, 2009; Chan & Ngok, 2011; Gertler et al., 2011; Levine & Levine 2011; Mitra et al., 2011;).

The study found that the Thailand is not yet fully a research based culture but the research universities playing great role in influencing the country to be research based culture. These universities are creating a culture of carrying research and contribute to the society in terms of maintaining or elevating the ability of researchers or knowledge workers to carry out the research and development and that to be of interest to the society. In addition, study found that there are very limited interest on research and development by the local industries, which weaken the Thailand Industries in terms of innovation. Though the innovation from universities embarked and sparked the industry to bring further those innovative things to be commercialized

but industry is still weak in innovation. The finding shows that country's industry needs to be strong in innovation, especially the small medium enterprise (SMEs).

The qualitative finding is supported by the quantitative data. The linear regression analysis shows that factors such as Human Capital, Governance, Culture and Infrastructure directly and indirectly influence the contribution of universities toward the Thailand becoming a KBS. Research, Innovation, academic quality and ICT directly influence the Contribution of Universities towards the Thailand becoming a KBS.

7.2 Contribution of the Study

Facts and significant data from this study may lead to existing effect contributions to the academic knowledge in the field of policy & implementation. The findings of this study could provide benefits to scholars and the government policy makers.

7.2.1 Contribution to Theory

This dissertation studied specific areas of Contribution of Universities toward Thailand Knowledge Based Society and aimed to provide supporting the empirical evidence. The results illustrated both consistent and different findings of earlier studies. The empirical results supported that Human Capital (Goldstein & Renault, 2004; Hanushek & Woessmann, 2008; Abel & Deitz, 2011; Mitra et al., 2011); Culture (Sanford, 1970; Kuh & Whitt, 1998; Tierney, 1998; Chapman, 2006; Fralinger & Olson, 2007); Academic Quality (Dill 2006; Santiago et al., 2008); Infrastructure (Kettinger, 1994; Chapman, 2006); Research (Bushaway, 2003; Vest, 2007; Santiago et al., 2008) and ICT (Cartelli, 2009; Ani & Edm, 2011; Oye et al., 2012) have direct influential effect on the Contribution of Universities towards nation becoming a KBS. However, some extent, there is unexpected result that differed from earlier studies. For instance Governance and Innovation did not directly influence the Contribution of Universities toward nation becoming a KBS but indirectly. In this regard, the difference may stem from the characteristics of universities activities. This may be because universities in Thailand are more towards the teaching and less focus

on the governance and innovation. However, it can be conclude that results of the study empirically supported the integration of the concept of Governance and Innovation from the universities leads to the Contribution of Thai universities toward the country becoming a KBS.

The findings of this study may provide benefits to scholars in the field of public policy and policy implementation. This research may regard as a support to existing education policy. In addition, other scholars may use it as a model for further study, or may want to modify the measurement instrument for use in their own research. This study's results could be benefited for the Thai Education system by alerting involved officers, decision makers regarding the importance of the Contribution of HEIs for the long-term benefit in building Thailand as KBS and remain one step ahead with other ASEAN countries. This study may encourage education officers, leaders, MoE, and the universities to recognize the necessity of the policy change and reformulation by raising awareness of the power of the knowledge society in creating competitiveness and differentiating from the global education market.

7.2.2 Contribution to Policy

In addition, this study can alert the necessity and urgency of policy and implementation for change. The study's results may assist and add value in framing the Thai education policy towards the KBS and improvement in the implementation of the government policy. The key factors such as Human Capital, Culture, Infrastructure, Research and ICT could affects and influence directly the Contribution of Thai Universities in building a nation towards the knowledge society. The Governance and Innovation could indirectly influence the Contribution of Thai Universities in building a nation towards the knowledge society. This study might be able to find how to enhance and raise awareness among both the general public and concerned officials about the significant contribution of universities toward nation building towards KBS. In the specific case, the policy makers may focus on development of human capital and with the proper funding supports from public and private sector for the country moving toward KBS.

7.3 Recommendations

Based on the research finding, the researcher recommended following policy model (figure 7.1) to Thailand becoming a KBS. In this regards, political will and the political leadership will play an important role with believe that Science and Technology Knowledge with proper infrastructure could enhance the country towards KBS. Therefore, this study recommends that political parties of the country must focus their party mission as country mission rather than focus on the individual party mission. In addition, the contribution of universities research and activities should have the impact on the society in order to improve the quality of living and narrow down the the societical gap between urban and rural areas. In this regard, state government should lead to reduce the gap in understanding, communication and others.

The finding from the qualitative and quantitative indicates that six factors are major director contributors of university towards Thailand becoming a KBS. In this regards, this study recommended six factors as main pillar in building the country toward KBS and the governance and innovation factor are the sub main pillars (indirect) in building the country towards KBS. In addition, state policy and the involvement of corporate sector, international non-organization; local non-government organization and the local community are also very important. Therefore, study recommended that policy and decision makers to involve all the concern party to be part of the policy development. Study also recommended that in framing the higher education policy, primary education institutions should also be taken into consideration as they play a very important for the country development and for the KBS.

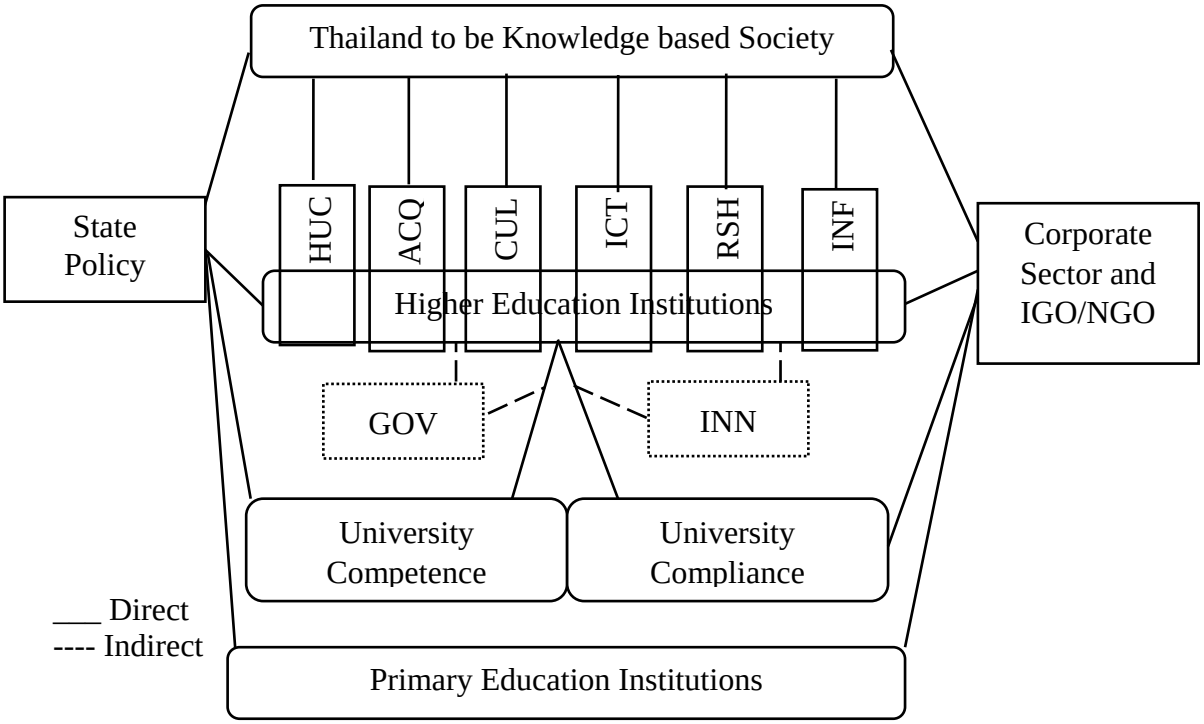


Figure 7.1 Recommended Policy Model to Frame Thailand to Become a KBS.

This study further suggested that Universities are encouraged to introduce and practice the multi-disciplinary research approach. At the same time creating a research culture, where scholars contribute and implement the idea for the country growth and development. This study also recommended encouraging knowledge workers and providing them the platform to learn the value of different belief and culture as well as different norms. In addition, study suggested encouraging the private sector to do more knowledge generation through continuous research with proper infrastructure support plus teaming up with the university experts. The researcher recommend to carry out the future studies in understanding the Government policy maker and implementer in regards to building country towards KBS. Study also recommended studying the contribution of Thai industries towards Thailand becoming a KBS as well as relationship between Industry and universities. In addition, partnership between Thai universities and industries should be explored in bigger scale such as developing innovative technology to support the agriculture and the manufacturing sectors. This needs to have strong support from the government as well as needs the strong political will from all political party.

7.4 Research Implication

The findings of this study were meaningful in a sense that it has achieved the research purpose of understanding the Contribution of Thai research universities towards Thailand becoming a KBS. Given the fact that universities are playing the lead role in the development of the country, the finding should lead to useful implication and help the policy makers with a better policy development. Some of the research implication could be as follows:

1) This research could help the university seriously consider supporting their faculty to team with industry for the technology innovation and as well as provide the platform for innovation with the support from industry.

2) Focus need to be on upgrading the quality of teaching faculty which impact directly to the future students and knowledge workers in their learning and enhancing their capacity and capability in contributing nation towards KBS.

3) Policy makers and the decision makers could strategize and plan for the technology innovation at university, where they can offer and design innovative degree program to fulfill the market demand and regenevoate the future knowledge workers

4) Leaders and government may practically encourage and stimulate Research Universities in Thailand to be powerful vehicles.

5) Universities must ensure to have adequate availability, facilities of scientific, and operation infrastructure for their knowledge worker.

6) University needs to have sufficient funding for new research project that could help the contribution of university in building a nation toward KBS.

7.5 Limitation of the Study

Study faces some of the limitation and these are as follows:

1) Language barrier was the first limitation because the researcher cannot read and write the local language (Thai). Some of the important documents are in their local language (Thai) and this limit the study to access more detailed information. For Example, Office of National Education Standards and Quality

Assessment (ONESQE), their evaluation and assessment reports are in Thai language, which limit this study to get the detail and specific information related to evaluation of academic quality.

2) By selecting only research universities, the generalizations of the research finding to other situations are compromised. In Thailand, there are other public and private universities operating in an environment more competitive which might not equally share same as contributions of the research universities.

3) Given the nature of relationships involved and the diverse nature of the target universities, it would be impractical to base the research on stiff measures of contribution of universities at various individual levels. Actually, it is difficult to have a generalized framework to accommodate all kinds of measures and arrive at conclusions about the relationship between contributions of universities toward Thailand becoming KBS. The study is therefore, limited to the nature of data.

BIBLOGRAPHY

Abel, Jaison R., and Deitz, Richard. (2011). Role of college and universities building human capital. *Federal Reserve Bank of New York Current n Economic and Finance*. *17*(6). Retrieved on February 12, 2012, from http://www.newyorkfed.org/researc h/current issues/2011.html

Ace, Zoltan. (2008). *Foundation of high impact entrepreneurship*. Delft, The Netherlands: Now Publishing Company.

ADB. (2005). *Arrive alive: ASEAN commits to cutting road deaths: association of southeast Asian nation's regional road safety strategy and action plan*. Manila: ADB.

ADB. (2006). Greater Mekong Subregion: Regional cooperation strategy and program update, August. Manila: ADB.

ADB. (2008). *Key indicators for Asia and the Pacific* 2008. Manilla: ADB.

ADB. (2011). *About greater Mekong Subregion*. Retrieved January 31, 2011from http://beta.adb.org/countries/gms/main

Adler, Michael, and Ziglio, Erio. (1996). *Gazing into the oracle: The Delphi method and its application to social policy and public health*. London, United Kingdom: Jessica Kingsley Publishers.

Alexander, King F. (2000). The changing face of accountability: Monitoring and assessing institutional performance in higher education. *The Journal of Higher Education, 71*(4), 411-431.

Alexandre, Ardichvili, Elena, Zavyalova, and Vera, Minina. (2012). Human capital development: comparative analysis of BRICs. *European Journal of Training and Development, 36*(2/3), 213–233.

Altbach, Philip G., Gumport, Patricia J., and Berdahi. Robert O. (2011). *American higher education in the twenty–first century: Social, political and economic challenges.* 3rd ed. Baltimore, Maryland, USA.: The John Hopskin University Press.

Amaral, Alberto, Jones, Glen A., and Karseth, Berit. (2002). *Governing higher education: National perspective on institutional governance*. Netherlands: Kluwer Academic Publishers.

Ambrosini, Veronique, and Bowman, Cliff. (2001). Tacit knowledge: Some suggestion for operationalization. *Journal of Management Studies*, *38*(6), 813-829.

Amir, Amizawati Md., Auzair, Sofiah Md., Maelah, Ruhanita, and Ahmad, Azlina. (2012). Determination of educational cost in public university: A modified activity based approach. *World Journal of Social Sciences, 2*(2), 34-48.

Andersson, Bertil. (2006). European research policy: Towards knowledge and innovation or trivial pursuit. In Luc E. Weber, and James J. Duderstadt, *Universities and business: Partnering for the knowledge society* (pp. 79-86). London, UK.: Econoomica.

Anderson, David R., Sweeney, Dennes J., and William, Thomas A. (2011). *Statistic for business and economics*. 11th ed. Mason, USA.: South-Western Cengage Learning.

Andersson, R., Qugley, M. J., and Wilhelmsson, M. (2009), Urbanization, productivity and innovation: Evidence from investment in higher education, *Journal of Urban Economics,* (1, July), 2-15.

Andrew, Tim G., and Sununta Siengthai. (2009). *The changing face of management in Thailand*. New York: Routledge.

Angsana Techatassanasoontorn, Trauth, Eileen M., and Suwan Juntiwasarakij. (2011). Analysis ICT and development: Thailand's path to the information economy. *Journal of Global Information Management*, *19*(1), 1-29.

Ani, Okon E., and Edm, Margaret. (2011). Framework for effective development of information and communication technology (ICT) policy in university libraries in Nigeria. In Esharenana E. Adomi, *Framework for ICT policy: Government, social and legal issues* (pp.148-163). Hershey, New York: Information Science Reference.

Arambewela, Rodney. (2010). Student experience in the globalized higher education market: Challenges and research imperatives.. In Felix Maringe, and Nick Foskett (Eds), *Globalization and international in higher education: Theoretical, strategic and management perspective* (pp. 155-174). London, United Kingdom: Continuum International Publishing Group.

Arthur, James. (2005). Student character in the British university. In James Arthur, and Karen E. Bohlin, *Citizenship and higher education: The role of universities in communities and society* (pp.6-24). London, UK.: RoutledgeFalmer.

Arthur, James, and Bohlin, Karen E. (2005). *Citizenship and higher education: The role of universities in communities and society*. London, UK.: RoutledgeFalmer.

Ary, Donald, Jacob, Lucy C., Sorensen, Chris, and Razavieh, Asghar. (2010). *Introducing to research in education*. 8th ed. Belmont, USA.: Wadsworth Cengage Learning.

Asheim, Björn T., and Parrilli, Mario D. (2012). *Interactive learning for innovation: a key driver within clusters and innovation systems.* Palgrave Macmillan, United Kingdom.

Asheim, Björn T., Coenen, Lars, and Moodysson, Jerker. (2009). *The life science cluster of medicon valley Scandinavia*. In Jonathan Potter, and Gabriela Miranda, *Cluster, innovation and entrepreneurship*. Paris: OECD.

Ashvin Ahuja, Thitima Chucherd, and Kobsak Pootrakool. (2006). *How capital policy: Building a competitive workforce for 21st century Thailand, First Draft*. retrieved July 24, 2009 from http://www.bot.or.th

Asian Institute of Technology (AIT). (2013). *Disaster preparedness, mitigation and management.* Retrieved December 12, 2013 from http://www.dpmm.ait.ac.th

Atkearney. (2011). *Offshoring opportunities amid economic turbulence: The A.T. Kearney Global Services Location Index*tm. Retrieved September 12, 2013 from http://www.atkearney.com/documents/10192/f062cfd8-ee98-4312-ae4f-0439afc10880

Audretsch, David B., Leyden, Dennis P., and Link, Albert N. (2012). *Regional appropriation of university-based knowledge and technology for economic development*. Department of Economic Working Paper Series. Retrieved April 19, 2012 from http://www.uncg.edu/bae/econ/research/ econwp/2012/12-03.pdf

Australian Chamber of Commerce & Industry (ACCI) and the Business Council of Australia (BCA). (2002). *Employability skills for the future.* Canberra: Department of Education, Science and Training.

Austrialian Government. (2012). *My university*. Retereived September 30, 2012 from http://www.myuniversity.gov.au

Azevedo, Americo. (2013). *Advances in sustainable and competitive manufacturing systems: 23rd International conference on flexible automation and intelligent manufacturing*. Switzerland: Springer.

Babalola, H. (2003). *Economic growth and human development*. Nsukka: University Press.

Baccaïni, Brigitte, and Dutreuilh, Catriona. (2007). *Inter-regional migration flows in France over the last fifty years.* Population (English edition, 2002), *62*(1), 139-155.

Backer, Larry Catá. (2012). *Transparency and business in international environmental law.* Retrieved July 30, 2012 from http://papers.ssrn.com/sol3/papers.cfm? abstract_id=1984346

Badin-Savin, Maggi. (2010). *A practical guide to using second life in higher education.* New York: McGraw Hill.

Baird, Jeanette. (1997). Accountability of university governing bodies in Australia: Issues of proponents of corporate models. *Tertiary Education and Management*, *3*(1), 72-82.

Baired, Laura M., and Oppenheim, Charles. (1994). Do citations matter? *Journal of Information Science*, *20*(1), 2-15.

Baker, David P., and Wiseman, Alexander W. (2008). *The worldwide transformation of higher education.* United Kingdom: Emerald Group Publishiing Limited.

Baldacci, Emaneele, Clements, Benedict, Gupta, Sanjee, and Cui, Qiang. (2008). Social spending, human capital, and growth in developing countries. *World Development. 36*(8), 1317-1341.

Baldridge, David C., Floyd, Steven W. and Markoczy, Livia. (2004). Are managers from mars and academicians from venue: toward and understanding of the relationship between academic quality and practical relevance. *Strategic Management Journal*, *24*, 1063-1074.

Ballantine, J., and McCourt, L. P. (2004). A critical analysis of student's perception of the usefulness of the case study method in an advanced management accounting module: The impact of relevant work experience. *Accounting Education, 13*(2), 171-189.

Bangkok Post. (2012a). Prasarn rips into upswell of populism. Retrieved April 16, 2012 from http://www.bangkokpost.com/news/local/288990/prasarn-rips-into-upswell-of-populism

Bangkok Post. (2012b). Thailand faces electronic exodus: Could lost half its position in 3 years. Retrieved June 12, 2012 from http://www.bangkokpost.com /business/economics/297641/thailand-faces-electronic-exodus

Bangkok Post. (2013). Bangkok "world's best city again. Retrieved September 15, 2013 from http://www.bangkokpost.com/news/local/358516/bangkok-is-world-s-best-city

Bangkok Post. (2014). First Thai women to be in space. Retrieved February 7, 2014 from http://www.bangkokpost.com/breakingnews/393624/thai-woman-wins-historic-trip-to-explore-space-for-six-minutes

Bank of Thailand. (2013). *Key economic indicator complete*. Reterieved September 19, 2013 from http://www.bot.or.th/English/Statistics/ Indicators/Pages/index.aspx

Barell, Marvin. (2003). Internationalization of universities: A university culture-based framework. *Higher Education*, *45*, 43-70.

Barney, Jay. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, *17*(1), 99-120.

Bastedo, Michael N. (2012). *The organization of higher education: Managing colleges for a new era*. Maryland, USA.: The john Hopkins University Press.

Becerra, Manuel, Lunnan, Randi, and Huemer, Lars. (2008). Trustworthiness, risk and the transfer of tacit and explicit knowledge between alliance partners. *Journal of Management Studies*, *45*(4), 619-713.

Becker, Gary S. (1993). *Human capital: A theoretical and empirical analysis, with special reference to education*. 3rd ed. Chicago, USA.: The university of Chicago press.

Beerel, Annabel. (2009). *Leadership and change management*. California, USA.: SAGE.

Beerkens, Eric. (2008). University policies for the knowledge society: Global standardization, local reinvention. *Perspectives on Global Development Technology, 7*(1), 15-31.

Bell, Daniel. (1973). *The coming of post-industrial society: A venture in social forecasting*. New York: Basic Book.

Bennis, Warren, Goleman, Daniel, and O'Toole, James. (2008). *Transparency: How leaders create a culture of candor.* San Francisco, USA.: Jossey- Bass.

Benoliel, J. Q. (1984). Advance nursing science: Qualitative approaches. *Western Journal of Nursing Research, 6*, 1-8.

Bernard, Newman. (2007). *Intellectual capital. Encyclopaedia of business and finance*. 2nd ed. Retrieved April 21, 2013 from http://www.encycopedia.com

Birnbaum, Robert. (2004). The end of shared governance: Looking a head or looking back. *New Directions for Higher Education*, 127, 5–22.

Blanden, Jo, Buscha, Franz, Sturgis, Patrick, and Urwin, Peter. (2012). *Measuring the earninig returns to lifelong learning in the UK. Economic of Education Review.* Retrieved April 12, 2012 from http://www.sciencedirect.com/science/article/pii/ S02727 75712000027?

Blasi, Paolo. (2006). The contribution of higher education and research to the knowledge society. In Luc Weber, and Sjur Bergan (Eds), *The public responsibility for higher education and research.* Council of Europe Higher Education series 2. New York: Council of Europe Publishing.

Bleiklie, Ivar, and Kogan, Maurice. (2007). Organization and governance of universities. *Higher Education Policy*, (20), 477-493.

Blewitt, J. (2010). Higher education for sustainable world. *Education+Training*, *52(*6/7), 477-488.

Blöndal, Sveinbjörn, Field, Simon, and Girouard, Nathalie. (2002). *Investment in human capital through upper secondary and tertiary education*. OECD Economic Studies, No. 34. Retrieved October 31, 2011 from http://www.investmentcompact.org/dataoecd/0/52/2640202.pdf

The Board of Investment of Thailand (BOI). (2007). Thailand: the world's electronics industry investment destination. Retrieved December 20, 2010 from http://www.boi.go.th/english/wh y/electronics_summary.pdf

Boccanfuso, Dorothee, Savard, Luc, and Savy, Elvire Bernice. (2012). Human capital and growth: New evidences from African data. *International Economic Journal.* Retrieved May 21, 2012 from http://dx.doi.org/10.1080/10168737.2012.659276

Bolisani, Ettore. (2008). *Building the knowledge society on the internet: Sharing and exchanging knowledge networked environments***.** Hershey, PA.: Information Science References.

Bonauti, Giovanni. (2003). Internet as a support tool in face-to-face teaching. In Antonio Calvani. *Technological innovation and changes in the university: moving towards the virtual university* (pp.121-140). Italy: Firenze University Press.

Bong-Dae, Kwon. (2009). *Human capital and its measurement. The 3rd OEDC World Forum on Statistics, Knowledge and Policy, Busan, Korea, 27-30 October*. Retrieved June 23, 2012 from http://www.oecd.org/dataoecd/31/52/ 44109779.pdf>

Bontis, Nick. (2004). National intellectual capital index: A United Nations initiative for the Arab region. *Journal of Intellectual capital*, *15*(1), 13-39.

Boonserm Weesakul. (2004). *A report in the series of research and development project on higher education management system: A summary of financing of Thai higher education*. Bangkok: Office of the Education Council, Ministry of Education, Thailand.

Booth, Ann. (1999). Education and economic development in Southeast Asia: Myths and realities. *ASEAN Economic Bulletin*. *16*(3), 290-306.

Bovens, Mark. (2010). Two concepts of accountability: Accountability as a virtue and as a mechanism. *West European Politics, 33*(5), 946-967.

Boyatzis, Richard E. (2002). *The competent manager: A model for effective performance.* New York: Wiley.

Boyer, Ernest. (1987). *College: The undergraduate experience in America*. New York: Herper and Row.

Brakel, Martin V., Hamrey, John, and Bunting, Stuart. (2011). *Mekong–inland fisheries and aquaculture*. Foresight project on global food and farming futures. Foresight, Government office for Science. Retrieved December 30, 2011 from http://www.bis.gov.uk/assets/bispartners/foresight /docs/food-and-farming/regional/11-595-r6-mekong-inland-fisheries-and-aquaculture

Brempong, Kwabena G., Paddison, Oliver, and Mitiku, Workie. (2006). Higher education and economic growth in Africa. *Journal of Development Studies*, *42*(3), 509-529.

Bridgstock, Ruth. (2009). The graduate attributes we've overlooked: Enhancing graduate employability through career management skills. *Higher Education Research & Development, 28*(1), 31-44.

Brophy, Monica, and Kiely, Tony. (2002**).** Competencies: A new sector. *Journal of European Industrial Training*, *26*(2), 165-176.

Budget Bureau Office, Thailand. (2013). *Government expenditure.* Retreived July 17, 2013 from http://www.bb.go.th/

Burke, Joseph C. (2004). Balancing all sides of the accountability triangle. *Trusteeship Magazine*. (November/December), 18-23.

Burke, Joseph C. (2005). Many faces of accountability. In Joseph C. Burke. *Achieving accountability in higher education: Balancing public, academic, and market demands* (pp. 1-24)**.** San Francisco, USA.: Jossey-Bass.

Bushaway, Robert W. (2003). *Managing research: Managing universities and colleges: Guides to good practice***.** Maidenhead, Philadelphia: UNSA Open University Press.

Buysse, Kristel. (2002). *Human capital and growth in OCED countries: The role of public expenditure in education*. Proceeding of Economic Research and International Relations Conferences in The Impacts of Fiscal Policy, Retrieved December 30, 2011 from http://www.bancaditalia.it/ studiricerche/convegni/atti/fisc_policy/iii/3.4_buysse.pdf

Cartelli, Antonio. (2009). Between tradition and innovation in ICT and teaching. Pp.187-. Patricia Rogets, Gary Berg, Judith Boettcher, Carole Howard, Lorraine Justice, and Karen Schenk. In *Encyclopedia of Distance Learning, Vol. 1*. 2nd ed. London: IGI Global.

Castells, Manuel. (2010). *The rise of the network society: The information age, economy, society and culture*. 2nd ed. Oxford: Blackwell.

Chaiyakorn Kiatpongsan. (2011). *The EU-Thailad relations: Tracing the patterns of new bilateralism.* Amersterdam: Amsterdam University Press.

Chan, Wing K., and Ngok, Kinglun. (2011). Accumulating human capital while increasing educational inequality: A study on higher education policy in China. *Asia Pacific Journal of Education*. *31*(3), 293-310.

Chanin Mephokee. (2003). *Thai labor market in transition toward a knowledge – based economy.* Retrieved December 21, 2007 from http://www.ide.go.jp/English/Publish/Asedp/pdf/066_cap1.pdf

Chapman, Perry M. (2006). *American places: In search of the twenty-frist century campus.* American Council of Education/Praeger, series of Higher Education, USA.: Praeger.

Charmaz, Kathy. (2006). *Constructing grounded theory*. London: Sage.

Chen, Shuange-Ye. (2012). Contributing knowledge and knowledge workers: The role of Chinese universities in the knowledge economy. *London Review of Education 10*(1), 101-112

Clark, Burton R. (1983). *The higher education system: Academic organization in cross-national perspective*. Berkeley: University of California Press.

Cohen, Arthur M., and Kisker, Carrie B. (2010). *The shapping of American higher education: Emergence and growth of the contemporary system*. 2nd ed. San Fransisco: Jossey-Bass.

Collins, Harry. (2010). *Tacit and explicit knowledge*. Chicago: The University of Chicago Press.

Comission of Higher Education (CHE). (2008). *Mannual for the internal quality assurance for higher education institutions.* Bangkok, Thailand: PARM PIM Ltd.

Connor, Mary, and Pokora, Julia. (2007). *Coaching and Mentoring at work: developing effective practice*. Berkshire, England: McGraw-Hill.

Coy, David, Fisher, Mary, and Gordon, Teresa. (2001). Public accountability: A new paradigm for college and university annual report. *Critical Perspective on Accounting*, *12*(1), 1-31.

Creswell, John W. (2009). *Research design: Qualitative, quantitative, and mixed method approaches*. 3rd ed. California: SAGE.

Creswell, John W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research.* 4th ed. Boston: PEARSON.

Creswell, John W., and Vicki, Plano Clark L. (2011). *Designing and conducting mixed methods research*. London: SAGE.

Crooks, Dauna L. (2001). The importance of symbolic interaction in grounded theory research on women's health. *Health Care for Women International*, *22*(1-2), 11-27.

Culin, Victoria and Scott, Hamish. (2011). The effectiveness of a live case study approach: Increasing knowledge and understanding of 'hard' versus 'soft' skills in executive education. *Management Learning*, published online 3 January 2012, DOI: 10.1177/1350507611431530, retrieved July 26, 2013 from http://mlq.sagepub.com/content/early/2012/01/03/1350507611431530

Daft, Richard L. (2008). *New era of management*. 2nd ed. Mason, USA.: Thomson Higher Education.

Dattalo, Patrick. (2009). *Strategies to approximate random sampling and assignment.* New York: Oxford University Press.

Davenport, Thomas H., and Prusak, Laurence. (1998). *Working knowledge: How organization manage what they know.* Boston, MA.: Harvard Business School Press.

De Boer, Harry, and Goedegebuure, Leo. (2001). On limitations and consequences of change: Dutch university governance in transition. *Tertiary Education and Management, 7*(2), 163-180.

De Boer, Harry, Huisman, Jeroen, and Meister-Schyettc, Claudia. (2010). Supervision in modern university governance: Board under scrutiny. *Studies in Higher Education*, *35*(3), 317-333.

De Meulemeester, Jean-Luc, and Rochat, Denis. (1995). A causality analysis of the link between higher education and economic development. *Economic of Educative Review*, *14*, 351-361.

Denscombe, Martyn. (2010). *The good research guide: For small scale social research projects.* 4th ed. Berkshir, England: McGraw- Hill Education.

Department for Education and Skills (DFES). (2003). *The Future of Higher Education.* London: HMSO.

Dill, David D. (2006). *A matter of quality: markets, information, and the assurance of academic standards.* Keynote address at the Kever Conference, Oulu, Finland, 11 October, Public Policy for Academic Quality, Department of Public Policy, The University of North Carolina at Chapel Hill, Retrieved March 22, 2012 from http://www.unc.edu/ppaq/docs/Oulu_Paper.pdf

Dill, David D., and Soo, Maarja. (2004). *Is there a global definition of academic quality?: A cross-national analysis of university ranking systems.* Public Policy for Academic Quality, Department of Public Policy, The University of North Carolina at Chapel Hill, Retrieved March 22, 2012 from http://www.unc.edu/ppaq/docs/League Tables2004.pdf

Dill, David D., and Soo, Maarja. (2005). Academic quality, league tables, and public policy: A cross-national analysis of university ranking systems. *Higher Education*, *49*, 495-533.

Douangngeune, Bounlouane, Hayami, Yujiro, and Godo,Yoshihisa. (2005). Education and natural resources in economic development: Thailand compared with Japan and Korea. *Journal of Asian Economics*, *16*(2), 179–204

Doughlass, John A. (2010). Creating a culture of aspiration: Higher education, human capital and social change. *Prodedia Social and Behavioral Science*, *2*(5), 6981-6995.

Drucket, Peter F. (1989). *The new realities.* New York: Harper & Row.

Drucker, Peter F. (1993). *Post-capitalist society*. New York: HarperCollins.

Drucker, Peter F. (2002). *The effective executive.* Adobe Acrobat E-Book Reader edition v.1, August. New York: HarperCollins Publishers.

Drucker, J., and Goldstein, H. (2007), Assessing the regional economic development impacts of universities: A review of current approaches. *International Regional Science Review*, *30*(1), 20-46.

DuBrin, Andrew J. (2009). *Essential of management.* 2nd ed. Mason, USA.: South-Western Cengage Learning.

Dunn, Delmer D. (2003). Accountability, democratic theory, and higher education. *Educational Policy, 17*(1), 60-79.

Dzinknowski, R. (2000). The measurement and management of human intellectual capital: An introduction. *Financial Management*, *78*, 32-36.

Eid, Ashraf. (2012). Higher education R&D and productivity growth an empirical study on higher income OECD countries. *Education Economics*, *20*(1), 53-68.

Elenurm, Tiit. (2008). Knowledge as open space. *Electronic Journal of Knowledge Management, 8*(2), 201-208. Retrieved July 28,2012 from http://www.ejkm.com

Elermann, Lutz, Meyer, Ingo, Roncozek, Darius, Korte, Werner B., and Ahokas, Ira. (2004). *Advancement of knowledge society: Comparing Europe, The US and Japan.* Eurpean Foundation for the Improving of Living and Working Conditions, Dublin, Ireland, Retrieved January 21, 2012 from http://www.eurofound.europa.eu/pubdocs /2004/03/en/1/ef0403en.pdf

Ergazakis, Kostas, and Metaxiotis, Kostas. (2011). The knowledge-based development agenda: Perspective for 2010-2020. VINE: *The journal of Information and Knowledge Management System*, *41*(3), 358-377.

Ergazakis, Kostas, Metoxiotis, K., and Psarras, J. (2006). A coherent framework for building successful knowledge cities in the context of knowledge based economy. *Knowledge Management Research and Practice*, *4*(1), 56-59.

Etxebarria, Goio, and Uranga, Gomez Mikel. (2004). Knowledge, values and tertiary: A case study. In Philip Cooke, and Piccaluga Andrea, *Regional economies as knowledge laboratories* (pp. 216-231). Masachusetts, USA.: Edwar Elgar Publishing Limited.

European Union. (2012). *EU economic governance*. Retrieved August 30, 2012 from http://ec.europa.eu/economy_finance/economic_governance/index_en.htm

Evan, Kiri, and Rorris, Adam. (2010). Optimising the impact of Vietnam's higher education sector on socio-economic development. In Grant Harman, Martin Hayden, and Thanh Pham Nghi, *Reforming higher education in Vietnam: Challenges and priorities* (pp. 167-181). Higher education dynamic Vol. 29. London: Springer Dordrecht Heidelberng.

Fabbris, Luigi, Boccuzzo, Giovanna, Martini, Maria C., and Scioni, Manuela. (2011). A participative process of the definatin of human capital indicator. In Salvatore Ingrassia, Roberto Rocci, and Maurizio Vichi. *New perspective modelling and data analysis* pp. 39-48.. Germany: Springer–Veriag Berlin Heidelberg.

Farazmand, Ali, and Pinkowski, Jack. (2006*). Handbook of globalization, governance, and public administration*. Boca Raton, USA.: CRC Taylor & Francis Group.

Ferlie, Ewan, Musselin, Christine, and Andresani, Gianluca. (2009). The governance of higher education systems: A public management perspective. In Catherine Paradeise, Emanuela Reale, Ivar Bleiklie, and Ewan Ferlie, *University governance: Western European comparative perspective* pp. 1-20. Higher Education dynamic Series 25. Rome, Italy: Springer.

Fielden, John. (2008). *Global trends in university governance.* Education working paper series 9. Washington, USA.: World Bank. Retrieved June 12, 2011 from http://siteresources.worldbank.org/EDUCATION/Resources/278200-1099079877269/5476641099079956815/Global_Trends_University_Governance_ webversion.pdf

Firestone, Joseph M., and McElroy, Mark W. (2003). *Key issues in the new knowledge management*. Burlingtom, USA.: Elsevier Science.

Fralinger, Barbara, and Olson, Valerie. (2007). Organizational culture at the university level: A study usig the OCAI instrument. *Journal of College Teaching and Learning*, *4*(11), 85-98.

Franzen, Martina, Weingart, Peter, and Rödder, Simone. (2012). Exploring the impact of science communication on scientific knowledge production: An introduction. In Martina Franzen, Peter Weingart, and Simone Rödder, *The sciences' media connection-public communication and its repercussions* (pp. 3-14). London, UK.: Springer.

Fraser, Sara W., and Greenhalgh, Trisha. (2001) Complexity science: Coping with complexity, educating for capability. *British Medical Journal*, *323*(7316), 799–803.

Fróhilich, Joseph, Gassler, Helmut, and Varga, Attila. (2006). The role of space in the creation of knowledge in Austria: An exploratory spatial data analysis,. In Manfred M. Fischer. *Innovation, network and knowledge spillovers* (pp. 189-210). Heidelberg, Germany: Springer.

Fry, G. (1999). *Management of education in Thailand: A review and recommendations for an Implementation strategy for decentralization (Education Management and Finance Study Project, THA2996-THA).* Bangkok: UNESCO.

Fry, Gerald W., Nieminen, Gayla S., and Smith, Harold E. (2013). *History dictionary of Thailand*. 3rd ed. UK.: Scarecow Press.

Fukugawa, Nobuya. (2012). University spillover into small technology-based firms: Channel, mechanism and geography. *Journal of Technology Transfer*, Online First: DOI: 10.1007/s10961-012-9247-x. Retrieved April 19, 2012 from http://www.springerlink.com/content/crh7t548j878q157/

Funnekotter, Bart. (2005). *Eureka: European research universities and the challenges of the 21st century*. Amsterdam, Netherlands: Amsterdam University Press.

Futuretimeline. (2013). *Computer and internet.* Retrieved November 19, 2013 from http://www.futuretimeline.net/subject/computers-internet.htm

Gammon, Lawrence. (2006). Improving student experience through making assessments flow. In Bryan Cordelia and Karen Clegg, *Innovation assessment in higher education* (pp. 132-140). London: Routeledge.

Geenhuizen, Marina V., and Nijkam, Peter. (2012). *Creative knowledge cities: Myths, visions and realities*. Northampon, Massachusetts: Edward Elgar Publishing.

Geiger, Roger L. (2004). *Knowledge and money*. Standard, California: Stanford University Press.

Gertler, Paul J., Patrinos, Harry A.,and Codina, Rubio Marta. (2011). Empowering parents to improve education: Evidence from rural Mexico. *Journal of Development Economics,* Reterived January 12, 2012 from http://www.sciencedirect.com/science/ article/pii/S0304387811000927

Geuna, Aldo, and Muscio, Alessandro. (2009). The governance of knowledge transfer: A critical review of the literature. Minera: *A Review of Science, Learning and Policy*, *47*(1), 93-114.

Giroux, Henry A. (2001). Critical education or training: Beyond the commodification of higher education. In Henry A. Giroux, and Kostas Myrsiades, (Eds), *Beyond the corporate university: Culture and pedagogy in the new millennium* (pp.1-12). New York: Rowman & Littlefield.

Giudice, Manlio D., Carayannis. Elias G., and Peruta. Mario D. R. (2012). Cross-cultural knowledge management and open innovation diplomacy: The conceptual understanding of knowledge and innovation. In Elias G.Carayanis, *Cross cultural knowledge management: Innovation, technology and knowledge management* (Vol. 11 pp.137-152). New York: Springer.

Glaser, Barney, and Strauss, Anselm. (1976). *The discovery of grounded theory: Strategies for qualitative research*. Aldine Transaction, A division of transaction publishers. USA.: New Brunswick.

Goedegebuure, L. C. J., Maassen, P. A. M., and Westerheijden, D. F. (1990). *Peer review and performance indicator: Quality assessment in british and dutch higher education*. Culemborg: Lemma.

Goldstein. Harvey A., and Renault, Catherines S. (2004). Contributions of universities to regional economic development: A quasi-experimental approach. *Regional Studies, 38*(7), 733-746.

Graham, Paul J., and Dickinson, Harley D. (2007). Knowledge–system theory in society: Charting the growth of knowledge–system models over a decade, 1994-2003. *Journal of the American Society for Information Science and Technology*, *58*(13), 2372-2381.

Grant, Robert M. (1999). Prospering in dynamically competitive environments: Organization capability as knowledge integration. *Organization Science, 7*(4), 375-387.

Grinnell, Richard, Jr. (1993). *Social work, research and evaluation.* 4th ed. Itasca, Illinois: FE Peacock Publishers.

Grinnell, Richard, Jr. (1997). *Social work research and evaluation: Quantitative and qualitative approaches*. Illinois: F.E. Peacock Publishers.

Gropello, Di. Emanuela, Tandon, Prateek, and Yusuf, Shahid. (2012). *Putting higher education to work: Skills and research for growth in East Asia*. Washington, D.C.:. World Bank.

Gumport, Particia J., and Pusser, Brain. (1999). University restructuring: The role of economic and political contexts. In John C. Smart (Ed.), *Higher education: Handbook of theory and research* (Vol. XIV p. 108). New York: Agathon Press.

Gürüz, Kemal. (2011). *Higher education and international student mobility in the global knowledge economy*. 2nd ed. Albany: State University of New York Press,.

Guzman, G. A. C., and Wilson, J. (2005). The soft dimension of organizational knowledge transfer**.** *Journal of Knowledge Management, 9*(2), 55-74.

Haldin-Herrgard, Tua. (2000). Difficulties in diffusion of tacit knowledge in organization. *Journal of Intellectual Capital, 1*(4), 357-365.

Hamid, Norsiah A., and Zaman, Halimah B. (2009a). Defining Malaysian knowledge society: Result from delhi technique.. In Militiadis D. Lytras, Patricia D. O. Pablos, David Avison, Ambjörn Naeve, and David G. Horner, *Best practices for the knowledge society* (pp.179-189). Heidelberg, Germany: Springer.

Hamid, Norsiah A., and Zaman, Halimah B. (2009b). *Human capital indicators: Towards achievening knowledge society in Malaysia*. Retrieved April 12, 2012 from http://www.napsipag.org/PDF/norsiah.pdf

Hamzah, Mohad S. G., and Abdullah, Saifuddin K. (2009). Generic skills in personnel development. *European Journal of social Science*, *11*(4), 684-689.

Hanna, Nagy K. (2010). *Innovation, technology, and knowledge management series.* New York: Springer.

Hansen, M. T., Nohria, N., and Tierney, T. (1999). What's your strategy for managing knowledge? *Harvard Business Review*, *77*(2), 106-116.

Hanushek, Eric A., and Woessmann, Ludger. (2008). The role of cognitive skills in economic development. *Journal of Economic Literature*, *46*(3), 607-668.

Hardi, Peter, and Buti, Krisztina. (2012). Corporate governance variables: Lessons from holistic approach to Central–Eastern Europe practice. *Corporate Governance*, *12*(1), 101-117.

Harvey, Lee, and Askling, Berit. (2002). Quality in higher education. In Roddy Begg, *The dialogue between higher education research and practice 25 years of EAIR* (pp. 69-84). New York: Kluwer Academic Publishers.

Heaney, Thomas. (2010). Democracy, shared governance and the university. In Dianne Ramdeholl, Tanio Giordani, Thomas Heaney, and Wendy Yanow, *New director for adults and continuing education: The struggle for democracy in adult education* (pp. 69-79). USA.: Jossey-Bass Company.

Hedesstrom, Ted, and Whitley, Edgar A. (2000). What is meant by tacit knowledge: Towards a better understanding of the shape of actions. In Hans R.Hansen, Martin Bichler, and Harald Mahrer, *8th European conference on information system, ECIS 2000 July 3-5, 2000* Wienna, Austria (pp-46-51).

Hedrick-Wong, Yuwa, and Choog, Desmond. (2013). *Master Card global destination cities index: MasterCard Worldwide Insight, 2Q*. Retrieved Sepember 22, 2013 from http://newsroom.mastercard.com/wp-content/uploads/2013/05/Updated-Mastercard_GDCI_Final_V4.pdf

Hermann, Douglas G., and Kenyon, R. J. (1987). *Competency-based vocational education*. London: Further Education Unit.

Hermans, Jos, and Nelissen, Marc. (2005). *Charters of foundation and early documents of universities of the Coimbra group*. Louvain, Belgium: Leuven University Press.

Hines, Dwight J. (2012). The post-industrial regime of production/consumption and the rural gentrification of the new west archipelago. *Antipode. 44*(1), 74-97.

Hoerl, Roger W., and Snee, Ronald D. (2012). *Statistical thinking: Improving business performance.* New Jersey: John Wiley & Sons.

Hoffmann, Terrence. (1999). The meaning of competency. *Journal of European Industrial Training*, *23*(6), 275-285.

Hofheinz, Paul. (2009). EU 2020 why skills are key for Europe's future. *Policy Brief*, *IV*(1), 1-20. Retrieved January 20, 2012 from http://www.lisboncouncil.net/publication/category/7.html

Hood, Christopher, James, Oliver, Peters, Guy B., and Scott, Colin. (2004). *Controlling modern government.* London: Edward Elgar.

Hrabinová, Š., Novosá, J., Hájek, O., and Pomazalová, N. (2012). Universities, human capital, social capital and enterprise: Some lesson from the Chech Republic. *Acta Universitatis Agriculturae et Silviculturae Mendeliane Brunnsis*, *LX*(2), 91-95.

Hu, Xiaohong. (2011). *The tention of the concept of human capital and evolution of its scope of investment in the creative economy times*. Proceeding of the Management and Service Science International Conference (pp. 1-6). Retrieved January 23, 2012 from http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=5998015

Huisman, Jeroen, and Currie, Jan. (2004). Accountability in higher education: Bridge over troubled water? *Higher Education*, *48*, 529-551.

James, Stephen C. (1997). Technological and management innovation as partner for economic growth. In Olivério D. D. Soares, Cruz Martinds da A., Costa G. Pereira, Isabel M. R. T. Soares, and Alibino J. P. S. Reis, *Innovation and technology: Strategies and policies* (pp.21-28). Netherlands: Kluwer Academic Publishers.

IDC. (2013). *Thai ICT market will look to new sources of growth to move on from political conflict—IDC Thailand*. Retrieved December 22, 2013 from http://www.idc.com/

Inglehard, Ronald F., and Norris, Pippa. (2012). The four horsemen of the Apocalypse: Understanding human security. *Scandinavian Political Studies*, *35*(1), 71-96.

Ingram, Richard T. (2004). *Testimony to the National Commission on Accountability in Higher Education, Washington, DC, 10 May*. Retrieved May 21, 2011 from http://www.sheeo.org/account/comm/testim/AGB%20 Testimony.pdf

International Chamber of Commerce. (2005). *Intellectual property: Sources of innovation, creativity, growth and progress*. Retrieved March 21, 2012 from http://www.iccwbo.org

Internet World Stats. (2013). Internets users in the world distributed by world region. Retrieved December 20, 2013 from http://www.internetworldstats. com/stats.htm

Ishengoma, Johanson M. (2011). Investing in Africa's high–level human resource: The challenges and paradoxes of implementing cost sharing in higher education policy in Tanzania. In Lily Mafela, and Herman Mussahara, *Setting of new social science research agencies for Africa in the 21st century* (pp.179-1999). Addis Ababa, Ethiopia: Organization for Social Science Research in Eastern and Southern Africa (OSSREA).

Istaiteyeh, Rasha. (2011). *Economic development and highly skilled returnees: The impact of human capital circular migration on the economy of origin countries: The case of Jordan*. Doctoral dissertation, Faculty of Economics and the Faculty of Organic Agricultural Sciences of the University of Kassel, Germany.

Japan International Cooperation Agency (JICA). (2013). *Japan-Thailand Collaboration leads to production of the first antibody of its kinds against all denegue virus type*. Reterived Setpember 14, 2013 from http://www.jica.go.jp/english/news/field/2013/130826_01.html

Jefferson, Theresa. (2007). Knowledge / information technology engineering management: The use of ICTs in Regional Conflicts, War and Terrorism. ***The Journal of Information and Knowledge Management Systems***, *37*(1), 14-17.

Johnson, J. L., and Podsakoff, P. M. (1994). Journal influence in the field of management. An analysis using Salancik's index in a dependency network. *Academy of Management Journal*, *37*(5), 1392–1407.

Johnson, Burke R., Onwuegbuzie, Anthony J., and Turner, Lisa A. (2007). Towards a definition of mixed method research. *Journal of Mixed Methods Research, 1*(2), 112-133.

Johnstone, Bruce D., and Marcucci, Pamela N. (2010). *Financing higher education worldwide: Who pays? Who should pay*? Baltimore, Maryland, USA.:The John Hopkins University Press.

Jones, Anita K. (2006). Knowledge diffusion: The prospects for more productive university-industry partnership. In Luc E. Weber, and James J. Duderstadt, *Universities and business: Partnering for the knowledge society* (pp. 87-98). Paris: Econmica Ltd.

Jorgensen, Greg. (2009). *World's greatest city: 50 reasons why Bangkok is No .1*. Retrieved September 19, 2013 from http://travel.cnn.com/bangkok/play /worlds-greatest-city-50-reasons-why-bangkok-no-1-466745

Kaiser, Henry F. (1974), An index of factorial simplicity, *Pschometrika, 39*, 31-36.

Kandiko, Camille B., and Weyers, Mark. (2013). *The global student experience: An international and comparative analysis*. London: Routlege.

Kantatip Sinhaneti. (2011). Emerging trends of Thai higher education and a case study of shinawatra university in coping with global challenges**.** *US- China Education Review*, *B 3*, 370-381.

Kearns, Paul. (2007). *The value motive: The only alternative to the profit motive.* England: John Wiley & Sons Ltd.

Kefela, Ghirmai T. (2010). Knowledge-based economy and society has become a vital commodity to courtiers. *International NGO Journal*, *5*(7), 160-166.

Keller, George. (2008). *Higher education and the new society*. Baltimore, USA.: The Johns Hopkins University Press.

Kendall, Diana. (2011**).** *Sociology in our time.* 9th ed. Beltmont, CA: Cengage Learning.

Kenneth, Mortimer P. (1972). *Accountability in higher education*. Washington, D.C, USA.: ERIC clearninghouse on higher education.

Kenny, Charles. (2003). Development's false divide: Giving internet access to the world's poorest will cost a lot and accomplish little. *Foreign Policy,* (January/February), 76-77.

Kenway, Jane, Bullen, Elizabeth, and Robb, Simon. (2004). The knowledge economy, the techno-preneur and the problematic future of the university. *Policy Futures in Education*, *2*(2), 330-349.

Kettinger, William J. (1994). National infrastructure diffusion and the U.S. information super highway. *Information & Management*, *7*(6), 357-368.

Kilper, Heiderose. (2009). *German annual of spatial research and policy 2009: New disparities in spatial development in Europe*. Heidelberg, Germany: Springer.

King Mungkut's University of Technology Thonburi (KMUTT). (2014). *Thailand's national research universities.* Retrieved August 30, 2014 from http://www2.kmutt.ac.th/eng/abt_history/abt_welcome.html

Kinnear, P. R., and Gray, C. D. (1994*). SPSS for windows made simple.* Hove: Lawrence Erlbaum Associates, Ltd.

Kirchsteiger, Georg, and Sebald, Alexander. (2009). Investment into education–doing as the parent did. *European Economic Review*, *54*(4), 501-516.

Kirschner, Paul A. (1992). Epistemology, practical work and academic skills in science education. *Science and Education*, *1*, 273-299.

Kislenko, Arne. (2006). Culture and customers of Thailand. USA.: Greenwork Publishing Group, Inc.

Kovač, Vesna, Ledič, Jasminka, and Rafajać, Branko. (2003). Academic staff participation in university governance: Internal responses to external quality demand. *Tertiary Education and Management***,** *9*(3), 215-232.

Kreitner, Robert, and Kinicki, Angelo. (2009). *Organization Behavior*. 9th ed. Boston, USA.: Irwin Mc Graw-Hill.

Kuh, George D., and Whitt, Elizabeth J. (1998). *The invisible tapestry: Culture in American college and universities.* Washington, DC.: ASHE-ERCOO Higher Education, Report 1, Association for Study of Higher Education.

Kuhn, Thomas. (1970). *The structure of scientific revolution*. 2nd ed. Chigao, USA.: University of Chicago.

Kumar, Krishnan. (2005). *From post-industrial to post-modern society new theories of the contemporary world*. 2nd ed. Oxford: Blackwell.

Kurtz, Marcus J., and Brooks, Sarah M. (2011). Conditioning the resources curse: Globalization, human capital, and growth in oil-rich nations. *Comparative Political Studies*, *44*(6), 747-770.

Lado, Augustine A., and Wilson, Mary C. (1994). Human resource systems and sustained competitive advantage: A competency-based perspective. *Academy of Management Review*, *19*(4), 699-727.

Lane, Robert. (1966). The decline of politics and ideology in a knowledgeable society. *American Sociological Review*, *31*(5), 649-662.

Laursen, Keld, and Salter, Ammon. (2004). Searching high and low: What types of firms use universities as a sources of innovation? *Reseach Policy*, 33(8), 1201–1215.

Laursen, Keld, and Salter, Ammon. (2006). Open for innovation: The role of openness in explaining innovation performance among U.K manufacturing firms. *Strategic Management Journal*, *27*, 131-150.

Lebret, Harvé, Månson, Jan-Anders E., and Aebischer, Patrick. (2006). The EPFL approach to innovation. In Luc E. Weber, and Duderstadt, James J. *Universities and business: Partnering for the knowledge society* (pp. 131-146). London: Econmica Ltd

Lee, Jong-Wha, and Franciso, Ruth. (2010). *Human capital accumulation in emerging Asia, 1970-2030*. Asian Development Bank Economics Working Paper Series No. 216. Retrieved November 24, 2011 from http://www.adb.org/economics

Leininger, Madeleine M. (1995). *Transcultural nursing: Concept, theories, research and practices.* New York: McGraw-Hill.

Leveille, David E. (2006). *Accountability in higher education: A public agenda for trust and c cultural changes*. Center for Studies in Higher Education (CSHE), University of California, Berkeley. Retrieved March 12, 2012 from http://cshe.berkekey.edu

Levine, Murray, and Levine, Adeline G. (2011). Who said the government can't do anything right? The world war II GI Bill, The growth of science and American prosperity. *American Journal of Orthopsychiatry, 81*(2), 149-156.

Li, F., Morgan, W. J., and Ding, X. (2008). The expansion of higher education, employment and over-education in China. *International Journal of Education Development*, (6), 687-697.

Lincoln, Yvonna S., and Guba, Egon G. (2000). *Naturalisitc Inquiry*. London: Sage.

Liu, Ou L. (2011). Outcomes assessment in higher education: Challenges and future research in the context of voluntary system accountability. *Educational Measurement: Issues and Pratice, 30*(3), 2-9.

Locke, William, Cunmings, Willian K., and Fisher, Donald. (2011). *The changing governance and management in higher education: The perspectives of the academy*. New York: Springer.

Luton, Larry S. (1996). *The politics of garbage: A community perspective on solid waste policy making.* Pittsburgh, USA.: University of Pittsgurgh Press.

Makhloufi, Abderrahman E. (2013). *Spatial economic metamorphosis of a nebula city: Schiphol and the schiphol region during the 20th century*. New York: Routledge.

Maringe, Felix, and Foskett, Nick. (2010). *Globalization and internationalization in higher education: Theoretical, strategic and management perspectives.* London: Continuum International Publishing Group.

Marques, J. P. C., Caraça, J. M. G., and Diz, H. (2006). How can university-industry-government interactions change the innovation scenario in Portugal?: The case of university of Coimbra. *Technovation, 26*, 534-542.

Mårtensen, M. (2000). A critical review of knowledge management as a management tool. *Journal of Knowledge Management*, *4*(3), 204-216.

Martinez, Mario. (2008). Competencies and higher education policy analyst. *Education Policy, 22*(5), 623-639.

Materu, Peter N. (2007). *Higher education quality assurance in Sub-Saharan Africa: Status, challenges, opportunities and promising*. World Bank Working Papers. Africa Human Development Series. Washington, DC.: World Bank Publication.

Mathur, Vijay K. (1999). Human capital based strategy for regional economic development. *Economic Development Quarterly*, *13*(3), 203-216.

Matsuura, Koichiro. (2007). Knowledge sharing–a powerful tool in the fight against poverty. *The Straits Time*, *6*(December), 27.

Mayo, A. (2005). Me and my capital. *The Magazine: Training Journal*, (September), 82-83.

Meara, KerryAnn O. (2011). Inside the panopticon: Studying academic reward system. In John C.Smart, and Michael B. Paulsen, *Higher education: Handbook of theory and research* (Vol. 26 pp.161-220). New York: Springer.

Meijer, Albert J. (2012). Introduction to the special issue on government transparency. *International Review of Administrative Science*. *78*(1), 2-9.

Mekong River Commission. (2006). *The MRC basin development plan: Completion report for phase 1.* Phnom Penh: Mekong River Commission Secretariat.

Melguizo, Tatiana. (2011). A review of the theories developed to describe the process of college persistence and attainment. In John C. Smart, and Michael B. Paulsen,. *Higher education: handbook of theory and research* (Vol. 26 pp. 395-424). London: Springer Science+Business Media B.V.

Melnikas, Borisas. (2010). Sustainable development and creation of the knowledge economy: The new theoretical approach. *Technological and Economic Development of Economy*, *16*(3), 516-540.

Menon, Maria Eliophotou. (2003). Student involvement in university governance: A need for negotiated educational aims. *Tertiary Education and Management*. *9*(3), 233-246.

Merriam-Webster Online Dictionary. 2009. *Knowledge.* Retrieved September 24, 2009 from http://www.merriam-webster.com/dictionary/knowledge

Michael, Steve O. (2005). Financing higher education in global market: A contextual background. In Michael, Steve O., and Kretovics, Marks A. *Financing higher education in a global market* (pp.3-32). New York: Algora Publishing.

Michael, Steve O., and Kretovics, Marks A. (2005). *Financing higher education in a global market.* New York: Algora Publishing.

Minbaeva, B. D., and Michailova, S. (2004). Knowledge transfer and expatriation in multinational corporation the role of disseminative capacity. *Employee Relation, 26*(6), 663-679.

Miner, A. S., and Mezias, S. (1996). Ugly duckling no more: Pasts and futures of organizational learning research. *Organization Science*, *7*(1), 88-99.

Mitra, Jay, Abubakar, Y. A., and Sagagi, M. (2011). Knowledge creation and human capital for development: The role of graduate entrepreneurship. *Education + Training, 53*(5), 462-479.

Mohan, Giles, and Mohan, John. (2002). Placing social capital. *Progress in Human Geography*, *26*(2), 669-679.

Molina, Alfonsa. (2008). *Towards an inclusive knowledge society in Italy.* Rome, Italy: Fondazione Mondo Digitale.

Mook, Ka-Ho. (2002). Policy of decentralization and changing governance of higher education in post-Mao China. *Public Administration & Development*, *22*(3), 261-273.

Narongrit Sombatsompop, Markpin, Teerasak, Ratchatahirun, Yochai, Wutthisit, Wongkaew, Chatree, and Premkamolnetr, Nongyao. (2010). Research performance evaluations of Thailand national research universities during 2007-2009. *Information Development, 29*(3), 303-313.

The Nation. (2006). 35 most influential Thai over the past 35 years. Retrieved September 24, 2013 from http://www.nationmultimedia.com/specials/35persons/

The Nation. (2009). Is Thailand ready to be an education hub? RetrievedJanuary 25, 2012 from http://www.nationmultimedia.com/2009/06/24/opinion/opinion_30105918.php

National Academy of Sciences. (2002). *Preparing for the revolution information technology and the future of the research university*. Washington, DC.: The National Academies Press.

National Center for Education Statistics, Digest of Education Statistics. (2013). *Advance release of selected 2013 digest table.* Retrieved November 30, 2013 from http://nces.ed.gov/programs/digest/2013menu_tables.asp

National Economic and Social Development Board (NESDB). (2012). *The eleventh national economic and social development: 2012-2016*. Retrieved January 24, 2012 from http://eng.nesdb.go.th/

National Statistical Office. (2013). *Statistical theme*. Thailand Ministry of Information and Communication Technology. Retrieved March 12, 2013 from http://web.nso.go.th/

Neave, Guy. (2006). Governance, power and coordination. *IAU Horizons: World Higher Education News, 11.4-12.1*(February), 4, Paris: International Association of Universities**.**

Nokkala, Terhi. (2007). *Constructing the ideal university: The internationalization of higher education in the competitive knowledge society*. Doctoral dissertation, Tampere University, Finland. Retrieved March 21, 2012 from http://acta.uta.fi/pdf/

Nonaka, Ikujiro. (1991). The knowledge creating company. *Harvard Business Review*. (November-December), 162-170.

Nonaka, Ikujiro, and Takeuchi, Hirotaka. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation.* New York: Oxford University Press.

Nonaka, Ikujiro, and Takeuchi, Hirotaka. (1998). A theory of the firm's knowledge creation dynamics. In Chandler, Alfred D., Hagstrom, Peter, and Sölvell, örjan. *The dynamic firm: The role of technology, strategy, organization and regions* (pp-214-241). Oxford, UK.: Oxford University Press.

Oba, Jun. (2010). Governance of the incorporated Japanese National Universities. In Mok, Ka-Ho. *The search for governance of higher education in Asia* (pp. 85-102). New York: Palgrave Macmillan.

Office of National Education Standards and Quality Assessment (ONESQA). (2010). *Annual report: October 1, 2009–September 30, 2010*. Retrieved September 30, 2013 from http://www.onesqa.or.th/en/annual/Annual%20Report% 202010.pdf

Office of the Higher Education Commission (OHEC). (2009a). *Thai higher education: Policy & issue*. Retrieved September 29, 2013 from http://inter.mua.go.th/main2/files/file/Plicy&Issue/OHEC%20Policy&IssueThai%20Higher%20Education%20PolicyIssue.pdf

Office of the Higher Education Commission (OHEC). (2009b). *Thailand's national research universities: National report.* Retrieved October 21, 2010 from http://rnu.mua.or.th

Office of the Higher Education Commission (OHEC). (2012). *Study in Thailand 2012*. Retrieved Sept 12, 2013 from http://inter.mua.go.th/main2/ article.php?id=301

Ogunade, Adeyemi O. (2011). *Human capital investment in the development world: An analysis of Praxis*. Schmid labor Research Center Seminar Paper Series, University of Rhode Island. Retrieved November 12, 2012 from http://www.uri.edu/research/ lrc/research/ papers.htm

Okiy, R. B. (2005). Strengthening information provision in Nigerian university libraries through information communication technology. *The Electronic Library, 23*(3), 311-318.

Oplatkha, Izhar, and Hemseley-Brown, Jane. (2010). The globalization and marketization of higher education: Some insights from the standpoint of institutional theory. In Felix Maringe, and Nick Foskett, *Globalization and internationalization in higher education* (pp. 65-82). London: Continuum International Publishing.

Orasa Kongthong. (2011). *Drought in Mekong river vulnerability of livelihood*. Master thesis, Environmental Studies and Sustainability Science, Lund University, Sweden.

Organization for Economic Co-operation and Development (OECD). (1998). *Human capital investment: An international comparison*. Paris: OECD.

Organization for Economic Co-operation and Development (OECD). (2000). *The appraisal of investment in education facilities*. Paris: OECD.

Organization for Economic Co-operation and Development (OECD). (2010a). *Education at Glance: OECD indicators*. Retrieved April 11, 2011 from http://www.oecd.org/dataoecd/45/39/45926093.pdf

Organization for Economic Co-operation and Development (OECD). (2010b). *Higher education in regional and city development.* Berlin, Germany. Retrieved April 11, 2011 from http://www.oecd.org/dataoecd/ 59/6/45359278.pdf

Organization of American States. (2012). *Knowledge based society*. Retrieved March, 12, 2012 from http://www.oas.org

Osuna, Martín Gerardo Velázquex. (2008). *Information technology as intellectual capital?: Instructional production at the tecnológico de monterrey*. Doctoral dissertation, Graduate College, the University of Arizona, United States.

Otsuka, kozo. (2012). University patenting and knowledge spillover in Japan: Panel-data analaysis with citation data. *Applied Economic Letters*, *9*(11), 1045-1049.

Oye, D. N., Iahad, N. A, and Rahim, Zairah Nor A. (2013). An application of UTAUT model for understanding acceptance and use of ICT by Nigerian university academician. In Susheel Chhabra, *ICT influence on human development, interaction and collaboration* (pp. 214-229). Hershey, United States: IGI Global.

Ozmen, Fatma. (2010). The capabilities of the educational organizations in making use o tacit knowledge. *Procedia Social and Behavioral Science*, (9), 1860-1865.

Pagano, Barbara, and Pagano, Elizabeth. (2003). *The transparency edge: How credibility can make or break you in business*. New York: McGraw Hill.

Paitoon Kraiponrsak. (2009). Roles of human capital and total factor productivity growth as sources of growth: empirical investigation in Thailand. *International Business & Economics Research Journal, 9*(12), 37-52.

Paitoon Sinlarat. (2004). Thai universities: Past, present and future. In Philip G. Altbach, and Umakoshi, Toru, *Asian universities: historical perspective and contemporary challenges* (pp. 201-220). Baltimore, Manryland: The John Hopkins University Press.

Parry, Ian W. H. (1998). Pollution regulation and the efficiency gains from technological innovation. *Journal of Regulatory Economics*, *14*(3), 229-254.

Passow, Honor J. (2008). *What competencies should undergraduate engineering program emphasis?: A dilemma of curriculum design that practitioners' opinion can inform*. Doctoral dissertation, University of Michigan, USA.

Pech, Sokhem, and Sunada, Kengo. (2008). Population growth and natural-resources pressures in the mekong river basin. *Royal Swedish Academy of Sciences*, *37*(3), 219-224.

Pegg, David. (2012). *The 25 most influential languages in the world: Geography and travel.* Retrieved September 30, 2013 from http://list25.com/the-25-most-influential-languages-in-the-world/

Perisco, John, and Morris, Patricia R. (1997). *The new business values for success in the twenty-first century.* Binghamton, NY: The Haworth Press.

Pero, Hervé. (2011). Research infrastructure of pan-European interest: The EU and global issues. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, 626-627*, S69-S71.

Perruchet, Pierre, Bigand, Emmanuel, and Benoit-Gonin, Fabienne. (1997). The emergence of explicit knowledge during the early phase of learning in sequential reaction time tasks. *Psychological Research*, *60*, 4-13.

Peter, Michael A. (2011). Three forms of the knowledge economy: Learning, creativity and openness.In Roger King, Simon Marginson, and Rajani Naidoo, *Handbook on globalization and higher education* pp.76-94. Cheltenham, UK.: Edward Elgar Publishing Limited.

Peterson, Marvin W., and Spencer, Melinde G. (1991). Understanding academic culture and climate. *New Direction for Institutional Research*, 1990(68), 3-18.

Piotrowski, Suzanne J. (2007). *Governmental transparency in the path of administrative reform.* New York: State University of New York Press.

Polanyi, Michael. (1967). *The tacit dimension.* New York: Garden City.

Presmus, Robert, and Sanders, Nada. (2003). Role of the university in regional economic development: The US experience. *International Journal of Technology Transfer and Commercialisation, 2*(4), 369-383.

Prien, Erich P., Schippmann, Jeffry S., and Prien, Kristin O. (2003). *Individual assessment: As practical in industry and consulting.* Mahwah, NJ.: Lawrence Erlbaum Association, Inc.

Psacharopoulos, G., and Patrinos, H. A. (2002). Returns to investment in education: A further update. World Bank Policy Research Working Paper No. 2881. Washington, DC: World Bank.

Psacharopoulos, George, and Woodhall, Maureen. (1997). *Education for development: An analysis of investment choices*. New York: Oxford University Press.

Rahman, Saemah, Mokhtar, Seri B., Yasin, Ruhizan M., and Hamzah, Mohd M. I. (2011). Generic skills among technical students in Malaysia. *Procedio Social and Behavioral Science*, *15*, 3713-3717.

Ramady, Mohamed A. (2010). *The Saudi Arabian economy: Policies, achievements, and challenges*. 2nd ed. New York: Springer.

Ramezan, Majid. (2011). Intellectual capital and organizational organic structure in knowledge society: How are these concepts related? *International Journal of Information Management*, *31*, 88-95.

Rantz, Rick, and Tangchuang, Phasian. (2005). Financing higher education in Thailand and future challenges. In Mark Kretovics, and Steve O. Michael, Financing higher education in global market (pp-309-322). USA.: Algora Publishing.

Rao, Bhaskara D. (2003). *World education forum.* New Delhi, India: Discovery Publishing House.

Reber, Arthur S. (1993). *Implicit learning and tacit knowledge: An essay on the cognitive uncioncious*. New York: Oxford University Press.

Reeves, Marjorie. (1988). *The crisis in higher education: Competence, delight, and common good.* Milton, Keynes, UK: Society for Research into Higher Education & open university Press,

Rheee, Byung-Shik. (2010). Incorporation of national universities of Korea: Dynamic forces, key features, and challenges. In Ka-Ho Mok. (2010). *The search for governance of higher education in Asia* (pp.67-84). New York: Palgrave Macmillan.

Rhoten, Diana, and Calhoun, Craig. (2011). *Knowledge matters: The public mission of the research university.* New York: The Social Science Research Council, Columbia University Press.

Riege, Andreas. (2004). Three-dozen knowledge–sharing barrier managers must consider. *Journal of Knowledge Management*, *9*(3), 18-35.

Robbin, Stephen P. (1993). *Organizational behaviour: Concepts, controversies and application.* 6th ed. Englewood Cliffs, N.J.: Princtice Hall.

Robinson, Viviane M. J., McNaughton, Staurt, and Timperley, Helen. (2011). Building capacity in a self-managing school system: The New Zealand experiences. *Journal of Educational Administration*, *49*(6), 720-738.

Rohrbach, Daniela. (2007). The development of knowledge societies in 19 OECD countries between 1970-2002. *Social Science Information*, *46*(4), 655-689.

Romzek, Barbara S. (2000). Dynamics of public accountability in an era of reform. *International Review of Administrative Sciences*, *66*(1), 21-44.

Rossman, Gretchen B., and Wilson, Bruce L. (1985). Numbers and words: Combining quantitative and qualitative method in a single large-scale evaluation study, *Evaluation Review*, *9*(5), 627-643.

Rowe, Christopher. (1995). Clarifying the use of competence and competency models in recruitment, assessment and staff development. *Industrial and Commercial Training*, *27*(11), 12-17.

Rubenstein, Albert. (1989). *Managing technology in the decentralized firm*. New York: Wiley.

Russo, Sergio. (1997). *The culture of innovation in higher education processes. Pp.157-166.* In Olivério D. D. Soares, Da Cruz Martinds A., Costa G. Pereira, Soares, Isabel M. R. T., and Reis, Alibino J. P. S. *Innovation and technology: Strategies and Policies*. Netherlands: Kluwer Academic Publishers.

Ryan, Sherry D., Xiaoni Zhang, Victor R. Prybutok, and Jason H. Sharp. (2012). Leadership and knowledge management in an E-government environment. *Administrative Science*, *2*(1), 63-81.

Samrit Yossomsakdi. (1999). *The government structure of Thai higher education and the policy–Making process in formulating the national development plans with respect to the higher education policies*. Doctoral dissertation Department of Political Science, Northern Illinois University.

Sandmaung, Mukdashine, and Khang, Ba Do. (2013). Quality expectation in Thai higher education institutions: Multiple stakeholder perspectives. *Quality Assurance in Education.* (3), 260-281.

Sanford, Nevitt. (1970). The contribution of higher education to the life of society. In W.R. Niblett, Higher education: Demands and responses (pp. 7-20). London: Tavistock Publication Limited.

Sanghai, Seema. (2007). *The handbook of competency mapping*. 2nd ed. New Delhi, India: Response Books.

Santiago, Paulo, Tremblay, Karine, Basri, Ester, and Arnal, Elna. (2008). *Tertiary education for the knowledge society: Special feature on governance, funding and quality*. Organization for Economic Co-operation and Development (OECD), Volume 1, retreat on 12 June 2011 from <www.oedc.org/publishing/corrigenda>

Santos, De-Sousa Boaventura. (2006). The universities in the 21st century: Towards a democratic and emancipator university reform. In Robert A. Rhoads, and Alberto Carlos Terres, The university, state, and market: *The political economy of globalization in the Americas* (Chapter 3, pp. 66-100). Standford, California: Standford University Press.

Schultz, Theodore W. (1961). Investment in human capital. *The American Economic Review*, *51*(1), 1-17.

Schwab, Klaus. (2011a). *The global competitiveness report 2010-2011*. World Economic Forum. Retrieved September 12, 2013 from http://www.weforum.org/gcr

Schwab, Klaus. (2011b). *The global competitiveness report 2011-2012*. World Economic Forum. Retrieved September 12, 2013 from http://www.weforum.org/gcr

Schwab, Klaus. (2012). *The Global Competitiveness Report 2011-2012*. World Economic Forum. Retrieved September 12, 2013 from http://www.weforum.org/gcr

Schwab, Klaus, and Salai-i-Martin, Xavieer. (2013). *The global competitiveness report 2012-2013*. World Economic Forum. Retrieved September 12, 2013 from http://www.weforum.org/gcr

Sen, Amartya Kumar. (1993). Capability and well-being. In Martha Craven Nussbaum, and Amartya Kumar Sen, *The quality of life* (pp.3-53). Oxford: Clarendon Press.

Seong, Somi, Popper, Steven W., and Zheng, Kugang. (2005). *Strategic choices in science and technology: Korea in the era of a rising China*. Santa Monica, CA.: RAND Cooperation.

Shapira, P., Youtie, J., Yogeesvaran, K., and Zakiah, J. (2006). Knowledge economy measurement: Methods, results and insight from Malaysian knowledge content study. *Research Policy*, *35*(10), 1522-1537.

Sharma, Ravi S., Dharmawirya, J. W and Ekundayo, M. (2010). A policy framework for understanding knowledge societies. *International Journal of Knowledge Society Research*, *1*(1), 23-46.

Sharma, Ravi S., Elaine, Ng W. J., Dharmawirya, Mathias and Keong, Chu Lee. (2008a). Beyond the digital divide: A conceptual framework for analysing creating knowledge societies. *Journal of Knowledge Management*, *12*(5), 151-164.

Sharma, Ravi S., Kwame, Anthony P., and Stephen, Bekoe. (2008b). Replicating the knowledge society in Ghana: A qualitative policy review. Retrieved April 24, 2011 from http://dx.doi.org/10.2139/ssrn.329870

Shattock, Micheal. (2006). *Managing good governance in higher education*. New York: McGraw-Hill Education.

Shi, Jinghuan and Neubauer, Deane E. (2009). Construction a general framework for quality evaluation in higher education. In Terance W. Bigalke, and Deane E. Neubauer, *Higher education in Asia/Pacific: Quality and the public good* (pp. -217-232). New York: Palgrave Macmillan.

Shiroyama, Hideaki. (2001). Regional governance in Asia: Comparative analysis of experiments of decentralization and deconcentration in India, Thailand and Korea.. In Yasutami Shimomura, *The role of governance in Asia* (pp. 6-26). Singapore: Institute of Southeast Asian Studies.

Sieber, Sam D. (1973). The integration of fieldwork and survey methods. *American Journal of Sociology, 78*(6), 1335-1359.

Silva, Elena. (2009). *Measuring skills for 21st–century learning: Measuring Result*. Retrieved May 21, 2012 from http://www.livoniacsd.org/Data/ Documents/DLT/ PDK_Measuing21st_May2009.pdf

Simonin, Bernard L. (1999). Transfer of marketing know-how in international strategies alliance: An empirical investigation of the role and antecedents of knowledge ambiguity. *Journal of International Business Studies*, *30*, 436-490.

Singh, Achyut K. (2008). *Education and national character.* New Delhi, India: APH Publishing Corporation.

Sippanondha Ketudat. (1972). Higher education in Thailand. *Bulletin of the UNESCO Regional Office for Education in Asia*, *7*(Sept 1).

Smith, Adam. (1976). *An inquiry into the nature and causes of the wealth of nations.* Oxford: Claren-don Press.

Smith, Dean O. (2011). *Managing the research university*. Madison, USA.: Oxford University Press.

Spangenberg, Joachim, and Mesicek, Roman. (2002). Sustainability indicators for the knowledge based society: Measuring sustainability of the information society. *Futura*, *21*(2), 85-95.

Sporn, Barbara. (2003). Trends relating to higher education reform in Europe: An overview. In Heather Eggins, *Globalization and reform in higher education* (pp. 117-130). Berkshire, England: Open University Press.

Stamoulas, Aristotelis. (2006). Greece before the Bologna process: Confronting or embracing quality assurance in higher education? *Higher Education Policy*, *19*(4), 433-455.

Stark, Ernie, Poppler, Paul P., and Murnane, Jennifer A. (2011). Looking for evidence of human capital (or the lack thereof) in college/university degrees held by managerial level employees. *Journal of Behavioral and Applied Management*, *13*(2), 60-80.

Statistic Canada. (2013). *Back to school*. Retrieved November 10, 2013 from http://www42.statcan.gc.ca/smr08/2013/smr08_177_2013-eng.htm

Stehr, Nico. (1994). *Knowledge Societies*. London: Sage.

Stiglitz, Joseph E. (1999). Knowledge as a global public good. In Inge Kaul, Isabelle Grunberg, and March A. Stern, *Global public good* (pp. 308-325). New York: United Nations Development Programme (UNDP).

Stimson, Robert J., Stough, Roger R., and Robert, Brain H. (2006). *Regional economic development: Analaysis and planning strategy*. 2nd ed. Liepzig, Germany: Springer.

Stone, Susan and Strutt, Anna. (2010). Transport infrastructure and trade facilitation in the greater mekong sub-region. In Douglas H. Brooks, and Susan F. Stone, *Trade facilitation and regional cooperation in Asia* (pp. 156-192). Cheltenham, United Kingdom: A Joint Publication of the ADB and Edward Elgar publishing.

Sucheera Pinijparakarn. (2013). *Some 1,000 mid-sized Japan firms eye Thai bases*. retrieved January 17, 2013 from http://www.nationmultimedia.com/ business/ Some-1000-mid-sized-Japan-firms-eye-Thai-bases-30198063.html

Sveiby, Karl E. (1997). The new organizational wealth: Managing and measuring knowledge-based assets. San Francisco, CA.: Berret-Koehler.

Tait, Hilary, and Godfrey, Helen. (1999). Defining and assessing competence in generic skills. *Quality in Higher Education*, *5*(3), 245-253.

Talbot, Louise, and Scott, Mick. (2004). *Knowledge based economy and society (KBE/S) indicators.* Australia Bureau of Statistics. Asia- Pacific ICT Technical Meeting 2004. Retrieved April 11, 2011 from http http://www.unescap.org/stat/ict/ict2004/.

Tapper, Ted. (2007). *The governance of British higher education: The struggle for policy control*. Netherlands: Springer.

Tashakkori, Abbas, and Creswell, John W. (2007). Exploring the nature of research questions in mixed methods research. *Journal of Mixed Methods Research, 1*(3), 207-211.

Taylor, John. (2010). The management of internationalization in higher education. In Felix Maringe, and Nick Foskett, *Globalization and internationalization in higher education* (pp. 97-108). London: Continuum International Publishing Groi.

Thai Board of Investment of Thailand (BOI). (2007). Thailand: The world's electronics industry investment destination. Retrieved December 20, 2010 from http://www.boi.go.th/english/wh y/electronics_summary.pdf

Than, Mya. (1997). Economic co-operation in the greater Mekong subregion. *Asian Pacific Economic Literature*, *11*(2), 40-57.

Thaweesak Koanantakool. (2000). *Struggling towards a knowledge based society*. International Symposim on Information Technology and Development Coopeation, Japan. Retrieved September 12, 2013 from http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN012802.pdf

Thompson, Virginia. (1941). *Thailand: the new Siam.* New York: Macmillan.

Tierney, William G. (1998). Organization culture in higher education: Defining the essentials. *The Journal of Higher Education*, *59*(1), 2-21.

Tighe, Thomas J. (2003). Who's in charge of Americas research universities: A blueprint for reform. Albany, USA.: State University of New York Press.

Toma, Douglas J. (2007). Expanding peripheral activities, increasing accountability demands and reconsidering governance in US higher education. *Higher Education Research and Development, 26*(1), 57-72.

Tubtimhin, Jirapon, and Pipe, Russel. (2012). *Global E-governance: Advancing E-governance through innovation and leadership*. Amsterdam, Netherlands: IOS Press BV.

UBS. (2012). *Prices and earning*. Wealth Management Research. Reterivied September 14, 2013 from http://www.ubs.com/2/e/medlib/wmr/pdf/Preise_Loehne_2012_e.pdf

United Nations. (2005). *Understanding knowledge societies: In twenty questions and answers with the index of knowledge society*. New York: United Nations Publication.

United Nations Development Program (UNDP). (2003). *Human development report, 2003: Building a knowledge society*. New York: UNDP.

United Nations Development Program (UNDP). (2009). *Human development report, 2008*. New York: UNDP.

United Nations Development Program (UNDP). (2013). *Thailand country profile: Human development indicators*. Retrieved September 18, 2013 from http://hdrstats.undp.org/en/countries/profiles/THA.html

United Nations Educational Scientific and Cultural Organization (UNESCO). (1998). *World declaration on higher education for the twenty-first century: Vision and action*. Retrieved January 15, 2012 from http://www.unesco.org/education/educprog/wche/declaration_eng.htm>

United Nations Educational Scientific and Cultural Organization (UNESCO). (2005). *Towards knowledge societies*. Paris: UNESCO.

United Nations Educational Scientific and Cultural Organization (UNESCO). (2009). *Guide to measuring information and communication technologies (ICT) in education.* Quebec, Canada: UNESCO Institute for Statistic.

Vaccaro, Antonino, and Sison, Alejo G. J. (2011). Transparency in business: The perspective of catholic social teaching and the "Caritas in Veritate". *Journal of Business Ethnics*. *100*(1), 17-27.

Velde, Christine. (2009). Exploring opportunities for collaborative linkages in the vocational education and training (VET) sector: A comparative study of VET in Australia and Japan. In Christine Velde, *International perspective on competence in the workplaces: Implication for research, policy and practice* (pp. 21-32).. Springer, London, United Kingdom.

Vest, Charles M. (2007). The American research university from world war II to world ide web: Government, the private sector, and the emerging meta-university. Berkeley, California: University of California Press.

Vickery, Graham. (2002). *OECD information technology outlook: ICTs and the information economy*, OECD Online Bookshop, Communication policy.

Vidovich, Lesley, and Slee, Roger. (2001). Bringing universities to account? Exploring some global and local policy tensions. *Journal of Education Policy*, *16*(5), 431-453.

Vroeijenstijn, A. I. (1995). *Improvement and accountability: Navigating between Scylla and Charybdis.* Higher Education Policy Series, Book 30. England: Jessica Kingsley.

Wall, June, and Ryan, Sandra. (2010). *Resourcing for curriculum innovation: Learning in a changing world*. Victoria, Australia: ACER Press.

Wang, Hong, and Thorns, David. (2009). Different forms of knowledge and new Chinese skilled immigrants' adaptation to New Zealand's knowledge society. *International Social Science Journal*. *60*(195), 85-95.

Wannapa Khaopa. (2012). Jums in students doing vocational courses. *The Nations* Retrieved July 22, 2012 from http://www.nationmul timedia. com/ national/Jump-in-students-doing-vocational-courses-30186735.html

Watchaneeporn Setthasakko. (2012). The implementation of eco-budgeting in food processors: A case of Thailand. *British Food Journal*, *114*(9), 1265-1278.

Watson, Keith. (1981). The Higher education dilemma in developing countries; Thailand's two decade of reform. *Higher Education*, 10, 297-314

Weert, Tom J. V. (2005a). *Education and knowledge society: Information technology supporting human development*. USA.: Springer, International Federation for Information Processing.

Weert, Tom J. V. (2005b). Lifelong learning in the knowledge society: Implication of education. In Tom V. J. Weert, and Van Hogescoo Utrecht, *Education and the knowledge society: Information technology supporting human development* (pp.15-26). USA.: Kluwer Academic Publishers.

Weightman, Barbara A. (2011). *Dragons and tigers: A geography of south, east and southeast asia*. 3rd ed. NJ.: John Wiley & Sons.

Whiddett, Sleve, and Hollyforde, Sarah. (1999). *A practical guide to competencies: How to enhance individual and organisational performance*. London: Chartered Institute of Personnel and Development, CIPD House.

Wood, Jack. (2003). Australia: An under performing knowledge nation? *Journal of Intellectual Capital, 4*(2), 144-164.

Woodhouse, David. (1999). Quality and quality assurance. In Jane Knight, and Hans D. Wit, *Quality and Internationalisation in higher education* (pp. 29-49). Paris: OECD.

Woollard, D., Zhang, M., and Jones, O. (2007). Academic enterprise and regional economic growth: Towards an enterprising university. *Industry and Higher Education*, *21*(6), 387-403.

Workman, Michael. (2010). Technology innovation adption and diffusions: A contrast perspective. In Ann S. Becker, and Robert E. Niebuhr, *Case studies in technology innovation: Entrepreneurial success and pitfall* (pp. 91-107). Hershey, PA.: Business Science Reference (IGI Global.

The World Bank. (2000). *Higher education in developing countries: Peril and promise.* The International Bank of Reconstruction and Development, The Task Force on Higher Education and Society by the World Bank, Washington, USA. Retrieved January 15, 2011 from http://siteresources.worldbank.org/INTAFRREGTOPTEIA/Resources/Peril_and_Promise.pdf

The World Bank. (2009). *Thailand-Towards a competitive higher education systems in global economy*. Retrieved January 15, 2012 from http://documents. worldbank.org /curated/en/2009/01/11377079/thailand-towards-competitive-higher-education-system-global-economy

The World Bank. (2013). *The world development indicator.* Retrieved September 19, 2013 from http://databank.worldbank.org/data/download/WDI-2013-ebook.pdf

World Intellectual Property Organization (WIPO). (2007). *Technology transfer, intellectual property and effective university-industry*. Retrieved September 19, 2013 from http://www.wipo.int/export/sites/www/ freepublications/en/intproperty/928/wipo_pub_928.pdf

Yamane, Taro. (1967). *Statisitics, an introductory analysis*. 2nd ed. New York: Harper and Row.

Yu, Wai-Mui Chirstina, and Velde, Christina. (2009). The changing context of business education: Competency requirements for the new paradigm. In V Christine elde, *International perspective on competence in the workplaces: Implication for research, policy and practice* (pp.57-86). London: Springer.

Yusuf, Shahid, and Nabeshima, Kaoru. (2007). *The international bank of reconstruction and development,* Washington, DC.: The World Bank.

Zaman, Halimah B. et al. (2011). A visual measurement mode on human capital and ICT dimensions of knowledge society framework for Malaysia towards an innovative digital economy. In Halimah B. Zaman, Peter Robinson, Maria Petrou, Shih K Olivier, Velastin Timothy, and Sergio Nyström. *Visual informatics: Sustaining research and innovations* (pp.323-339). Second international visual informatics conferences, IVIC 2011. London: Springer.

Zaman, Khalid, Iqtiard Shah Ali, Mushtag Muhammad Khan, and Mehboob Ahmad, (2012). Macroeconomic factors determining FDI impact on Pakistan's growth. *South Asian Journal of Global Business Research. 1*(1), 79-95.

Zastrow, Charles, and Kirst-Ashman, Karen K. (2009). Understanding human behavior and the social environment. 8th ed. Belmant, CA.: Brooks/Cole Cengage Learning. From http://www.moeys.gov.kh/en/about-us.html, Ministry of Education, Youth and Sport.

Zeleza, Paul T. (2007). Knowledge, globalization, and hedgemony: Production of knowledge in the twenty-first century.. In Sverker S örlin, and Hebe Vessuri, (2007). *Knowledge society vs knowledge economy knowledge, power and politics* (pp.79-106). New York: Palgrave Macmillan.

APPENDICES

APPENDIX A

A KNOWLEDGE TYPOLOGY

Domains/ Attributes	World 1 Knowledge	World 2 Situational Knowledge	World 2 Knowledge Predispositions	World 2 Knowledge	
Encoded	√	√	√	√	
Validated	√	√	√	√	
Tacit	NA	√	NA	NA	
Implicit	NA	Knowledge that is associated with other knowledge, not explicit, but can be made so	NA	Knowledge that may be derived from explicit knowledge using logic	
Explicit	NA	√	NA	1. Structured database knowledge claims 2. Descriptive factual statements 3. Conceptual models 4. Data models object models 5. Computer simulation models 6. Planning models 7. Analytical models 8. Measurement models 9. Predictive models 10. Impact models 11. Assessment models 12. Application software 13. Validation criteria, perspectives and frameworks 14. Methods	15. Methodologies 16. Formal language utilities 17. Semiformal language utilities 18. Meta-knowledge claims 19. Planning knowledge claims 20. Descriptive knowledge claims 21. Factual knowledge claims measurements of abstractions 22. Knowledge claims about impact, cause, and effect 23. Predictive knowledge claims 24. Assessment knowledge claims

Source: Firsetone and McElroy, 2003: 27-28.

APPENDIX B

THE ACCOUNTABILITY MODEL

Accountability Features	Bureaucratic	Professional	Political	Managerial	Market	Managed Market
Levers	Rules	Expertise	Policies	Management	Markets	Markets Policies
Agents	Bureaucrats	Peers	Policymaker	Manager	Entrepreneurs	Entrepreneurs Policymakers
Goals	Efficiency	Quality	Priorities	Productivity	Responsiveness	Responsiveness Priorities
Indicators	Input Processes	Processes	Outcomes	Input Outputs	Outputs	Outputs Outcomes
Conditions	Stability	Autonomy	Consensuses	Dynamic	Demand Capacity	Demand Capacity Incentives
Techniques	Regulation	Consultation	Planning	Cost-Benefit Analysis	Customer Satisfaction	Customer satisfaction Priority Planning
Consequences	Continuation Sanctions	Participation Neglects	Incentives Losess	Promotion Demotion	Profits Losses	Profits Incentives Losses
Governances	Centralized	Collegial	Direction Decentralized	Decentralized	Market Forces	Public– Private Partnerships
Theory	Scientific Management	Collegial Governance	Public Policy	Reinventing Government	Market Economics	Market Steering
Program	Financial Program Audits	Assessment Accreditation Academic Audits Standardized testing	Report Cards Performance Reporting Budgeting Funding	Performance Report	Student-alumni satisfaction Survey Reputational Ratings	Charter Colleges Vouchers Financial aid

Sources: Burke, 2005: 1-24.

APPENDIX C

TWO CONCEPTS OF ACCOUNTABILITY

Accountability	Virtue	Mechanism
Locus	Behaviour of Actor	Relation Actor-Forum
Focus	Evaluate/Prescriptive	Analytical /Descriptive
	Substantive Standards	Effect of Arrangements
Field of Study	Good Governance	Political and Social Control
Research Design	Dependent Variable	Independent Variable
Importance	Legitimacy	Various Goals
Deficit	Inappropriate Behaviour	Absent or Malfunctioning Mechanism

APPENDIX D

UNESCO KBS INDICATORS

Indicator	Definition	Source
Expected Schooling	The expected number of years of schooling, or school life expectancy (SLE), is defined as the total number of years of schooling that a child can expect to receive, assuming that the probability of his or her being enrolled in school at any particular future age is equal to the current enrolment ratio at that age.	UNESCO Institute for Statistics, http://www.uis.unesco.org
Young Population	Percentage of the total population that is in the 0-14 age group	World Bank, Human Development Network, and the United Nations Statistics and Population Division
Newspapers	Daily newspapers per 1,000 population (Daily newspapers refer to those published at least four times a week.)	UNESCO Institute for Statistics, http://www.uis.unesco.org
Internet Diffusion	Internet users per 10,000 population	ITU http://www.itu.int/ITU-D/ict/statistics
Telephone Diffusion	Main phone lines per 100 population and cellular subscriptions per 100 population	ITU http://www.itu.int/ITU-D/ict/statistics
R&D Expenditure	R&D expenditure as % of GDP	UNESCO Institute for Statistics, http://www.uis.unesco.org
Education Expenditure	Education expenditure as % of total government expenditure (Public expenditure on education is current and capital public expenditure on education.)	UNESCO Institute for Statistics, http://www.uis.unesco.org
Freedom from Corruption	Corruption Perception Index	Transparency International
Child Mortality	Children (under five years of age) - mortality rate per 1,000 live births	UNICEF estimates
Income Distribution (GINI Index)	GINI Index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution.	World Bank's Development Research Group, in *World Development Indicators, 2003*
Protected Areas	Ratio of protected areas to surface area	UNSD calculated from UNEP (Millennium Indicator)
CO2 Emissions	Carbon dioxide emissions (CO2), metric tons of CO2 per capita	UNFCCC-UNDESA/Statistics Division (Millennium Indicator)
Health Expenditure	General government expenditure on health as % of total government expenditure	World Health Organization
Military Expenditure	Military expenditure as % of GDP	CIA World Factbook, http://www.cia.gov
Primary Pupil/ Teacher Ratio	Number of pupils enrolled in primary school divided by number of primary school teachers (regardless of their teaching assignment)	UNESCO Institute for Statistics, http://www.uis.unesco.org

APPENDIX E

LIST OF COMPETENCIES

1. Quantitative data analysis skills
2. Work effectively on a team
3. Ability to identify appropriate data sources to inform decision making
4. Develop alternative solutions to a single problem
5. Writing skills appropriate for a given policy audience
6. Provide recommendations based on multiple alternatives
7. Interpret laws and policies
8. Knowledge of appropriate data collection methods
9. Group facilitation skills
10. One-on-one negotiation skills
11. Evaluate impact of laws and policies
12. Work effectively individually; self-directed
13. Knowledge of higher education policy issues
14. Manage projects
15. Awareness of current political climate
16. Understand one's organizational purpose and culture
17. Build a network of professional contacts
18. Knowledge of comparative state-level higher education governance and finance policy issues
19. Qualitative data analysis skills
20. Formal presentation skills
21. Awareness of public concerns and societal issues
22. Ability to forecast or identify emerging trends that might impact higher education policy
23. Advocate for preferred solutions or alternatives
24. Knowledge of legislative processes and procedures
25. Work with or manage budge

APPENDIX F

LETTER OF REQUEST FOR THE APPOINTMENT

Date: _____ 2013

To

_____

_____

Dear _____

I am currently pursuing my PhD from National Institute of Development Administration (NIDA), Bangkok. My thesis topic is **Contributions of Thai Research Universities towards Thailand becoming knowledge based society**". At the moment, I am in the process of collecting information and data.

In this regard, I would highly appreciate if you could give me an opportunity to meet with you from your valuable time any date and time in the month of _____or early week of _____2013 to seek your opinion on the following research questions:

- Please explain your understanding about the Knowledge Based Society (KBS): Thailand becoming KBS?
- In Your opinion what should be the focus of the government towards the research Universities?
- In Your opinion what are the main factors that contribute university towards the Country to become a knowledge society?
- What are your saying about the role of Thai Research in building nation towards KBS?

I am attaching herewith the support letter from NIDA for your kind information. Please accept my sincere thanks in advance for your kind consideration.

Thank you

Tenzin Rabgyal (Mr)

Ph.D. Student

Class 14, GSPA, NIDA

APPENDIX G

INTERVIWED EXPERTS

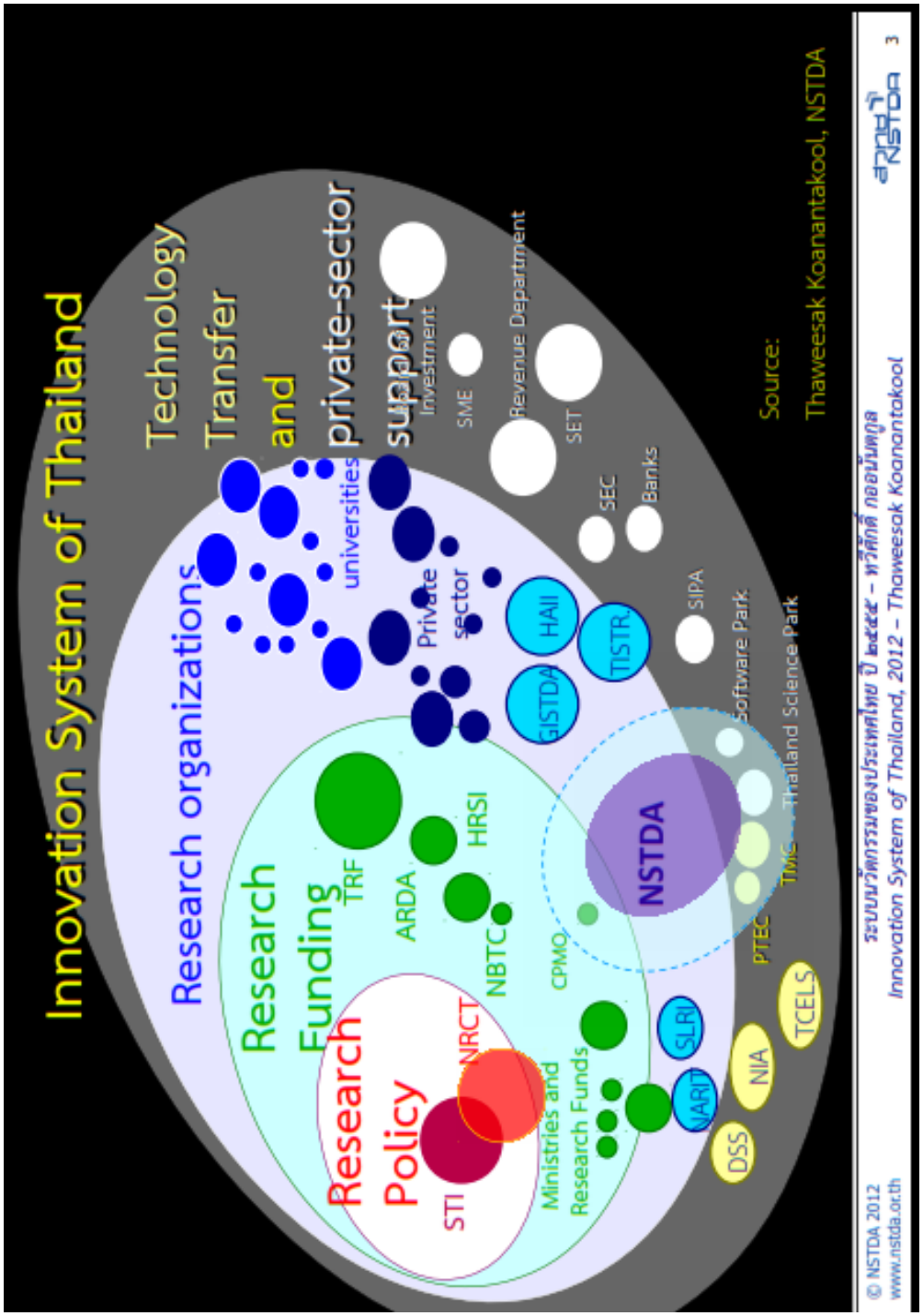
#	Name	Designation
		Category 1
1-1	Prof. Emeritus Khunying Suchada Kiranandana	✓ **Chairperson**, University Council, Chulalongkorn University ✓ Former President, Chulalongkorn University (CU) ✓ Former Dean, Graduate School (CU) ✓ Former, Dean of the Faculty of Commerce, CU
1-2	Assoc. Prof. Kittichai Triratanasirichai	✓ **President,** Khon Kean University (KKU) ✓ Member of Greater Mekong Sub-Region Academic and Research Network (GMSARN) ✓ Former Vice President for Research, KKU
1-3	Prof. Prasart Suebka	✓ **Rector,** Suranaree University of Technology (SUT) ✓ President of Association of Universities of Asia and the Pacific, (AUAP). ✓ President of the University Sports Board of Thailand, (USBT) ✓ President of Association of Southeast Asia Institutions of Higher Learning (ASAIHL, Thailand
1-4	Prof. Sakarindr Bhumiratana	✓ **President**, King Mongkut's University of Technology Thonburi (KMUTT) ✓ Member of Scientific Directors of International Life Sciences Institute (ILSI), South East Asia Region ✓ Member of the Federation of Institutes of Food Science and Technology in ASEAN (FIFSTA). ✓ Former President of National Science and Technology Development Agency (NSTDA) ✓ Former President of the Food Science and Technology Association of Thailand ✓ Former Director of National Center for Genetic Engineering and Biotechnology
1-5	Prof. Dr. Prasit Palittapongarnpim	✓ Vice President for Research, Mahidol University MU) ✓ Faculty member of Microbiology, MU
1-6	Prof. Prasit Watanapa	✓ Deputy Dean and Director of Siriraj Medical School, MU ✓ Former Vice President for Research, Mahidol University (MU)
1-7	Prof. Chongrak Polprasert	✓ Faculty Member of School of Bio- Chemical Engineering and Technology (BCET), Sirindhorn International Institute of Technology SIIT, Thammasat University (TU) ✓ Former Director, SIIT, TU
1-8	Prof. Wanchai De	✓ Faculty of Pharmaceutical Sciences, CU

#	Name	Designation
	Eknamkul	✓ Former member of drafting Education policy ✓ Former Deputy Director of National Research University Project
1-9	Dr.Suthisak Kraisornsuthasinee	✓ Faculty member, Department of Marketing, Thammasat Business School, (TU)
1-10	Dr. Sajee Sirikrai	✓ Head, Department of Operation Management, Thammasat Business School, (TU)
1-11	Dr. Prapod Assavavirulhakarn,	✓ Dean of Faculty of Art, Chulalongkorn University
1-12		✓ Dean, Faculty of Agriculture, Kasertsart University (KU)
1-13	Dr.Rapeeporn Srijumpa	✓ Former Dean, Faculty of Economic, KU
1-14	Assoc. Prof. Bordin Rassameethes,	✓ Dean, Faculty of Business Administration, KU
1-15		✓ Associate Dean, Faculty of Agriculture, KU
1-16	Dr. Rawiwan Wanwichai	✓ Dean of Faculty of Fine Arts, Srinakharinwirot University (SU)
1-17	Dr. Lertsiri Bovornkitti	✓ Associate Dean for international Relation, Faculty of Art, SU
		Category 2
2-1	Khun Abhisit Vejjajiva (PhD)	✓ Leader of the Democrat Party, Thailand ✓ Member of Parliament, Thailand ✓ Former Prime Minister of Thailand
2-2	Prof. Kriengsak Chareonwongsak,	✓ Senior Fellow at Harvard Kennedy School, USA ✓ Economist ✓ Executive Board of the Democratic Party ✓ Chair of Success Group of Companies, Thailand ✓ President of Institute of Future Studies for Development Bangkok ✓ Former Member of Parliament, Thailand
2-3	Dr. Suthasri Wongsamarn	✓ Deputy Secretary General, Office of Education Council (OHEC), (MoE), Thailand
2-4	Assoc. Prof. Kamjorn Tatiyakavee	✓ Deputy Secretary-General, Commission of Higher Education, Ministry of Education, (MoE), Thailand ✓ Chairman of the Audit Committee, TRC Construction Public Company Limited ✓ Former Vice President of Human Resource office, (CU)
2-5	Prof. Soottiporn Chittmittrapap	✓ General Secretary, National Research Council of Thailand (NRCT) ✓ Former Vice President for Research and International Affairs, CU
2-6	Dr. Thaweesak Koanantakool	✓ President, NSTDA, Ministry of Science and Technology (MoST) ✓ Former Executive Deputy Director, National Electronics and Computer Technology Center (NECTEC)

#	Name	Designation
		Category 2
2-7	Mr. Ekaphong Lauhathiansind	✓ Deputy Director, Office of National Education Standards and Quality Assessment (ONESQA), MoE, Thailand
2-8	Dr. Wananit Wimuttisuk	✓ Researcher, BIOTECH ✓ Adjunct Faculty and Research Advisor
2-9	Khun Lakhana Dockiao	✓ Chief, Education Hub Development Group, CH, MoE,
		Category 3
3-1	Dr. Libing Wang	Coordinator Asia-Pacific Programme of Educational Innovation for Development (APEID), UNESCO, Bangkok
3-2	Mr. Jin Hyung Kim	Associate Program Specialist, APEID, UNESCO, Bangkok
3-3	Ms. Wanapa Khoapa	Journalist at Nation Newspaper
3-4	Mr. Bruce Avasadanond	Journalist at Radio Thailand
3-5	Ms. Rawong Rojvanit	Operation Officer, World Bank, Thailand Office

APPENDIX H

INNOVATION SYSTEM OF THAILAND



APPENDIX I

SURVEY

http://localhost/limesurvey/index.php/admin/authentication/sa/logout

Saweedeekarb, I am a doctoral student at National Institute of Development Administration (NIDA), Bangkok. Currently I am in the process of gathering information and collection data for my dissertation. In this regard, I would like to request your kind help in filling up this questionnaire, which takes about 15-20 minutes to complete. This questionnaire is designed to study the "Contribution of Thai Research Universities towards Thailand becoming the Knowledge Based Society". The responses will be kept confidential and will solely be used for the purpose of an academic research. Please accept my sincere thanks in advance for your kind help and support. *Tenzin RABGYAL*

Part I: Demography Please Mark (X)

Are you from any one of the following universities: If yes, please give me some of your valuable time and help me in my study?

Chulalongkorn University ☐	Kasetsart University ☐	Prince of Songkla University ☐
Chiang Mai University ☐	Mahidol University ☐	King Mongkut University Technology Thonburi ☐
Khon Kaen university ☐	Thammasat University ☐	Suranaree University of Technology ☐

Currently you are:

Master Student ☐ Doctoral Student ☐ Faculty Member ☐ Research Staff ☐

Your Gender: Male ☐ Female ☐

What is your area of study or program?

Agriculture ☐	Engineering ☐	Engineering / Technology ☐
Science ☐	Education ☐	Liberal Arts (Humanities/Social Science/Political/) ☐
Nursing ☐	Medical ☐	Management/Commerce/Accounting/ Economics ☐

What is your age?

20-25 ☐	36-40 ☐	51-55 ☐
26-30 ☐	41-45 ☐	56-60 ☐
31-35 ☐	46-50 ☐	60 and above ☐

Nationality: Thai ☐ Other (Please specify)

Will you wish to receive a summary of the final result? Yes ☐ No ☐

If yes, Email to which I should send the summary report:

Part II: Please indicate your understanding with the following items related to the current situation in your university. Using a scale of 1-10, where 1 represents Least Agree (LA) and 10 as Strongly Agree (SA)

#		Items	Least Agree									Strongly Agree
			1	2	3	4	5	6	7	8	9	10
		Contribution of University										
1.	My university	creates knowledge for	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2.		Shares improving the	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3.		Uses general wellbeing of the Thai people.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4.		enables people development (Thai).	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5.		enables information creation.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6.		helps Thai people prosper in their life. (Enhance quality of life).	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7.		provides opportunities for all kinds of knowledge to be mass-produced and utilized throughout the whole society.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		Human Capital										
8.		I am satisfied with of creation of human capital through education provided by my university.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9.		Human capital produced by my university contributes the economic development of the country.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10.		My university plays a vital role in producing human capital for the country's development.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.		Human capital generated through my university is the major sources of development of the country.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.		Emphasizes and focuses on knowledge creations.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13.	My university	Provides equal opportunities to gain knowledge to broader society.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

#	Items		Least Agree									Strongly Agree
			1	2	3	4	5	6	7	8	9	10
14.	Courses taught at my university fulfill current needs of the society.		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
15.	Knowledge gained from my university aims to fulfill sufficient for societal needs.		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
16.	My university	transmits systematic knowledge that can be shared.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
17.	My university	encourages close interaction and transmission of knowledge between teacher and learner.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
18.	My university	disseminates knowledge to the public through Documents.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
19.	My university	disseminates knowledge to the public through Research articles.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
20.	My university	disseminates knowledge to the public through Thesis.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
21.	My university	disseminates knowledge to the public through Conferences and Seminars.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
22.	My university	disseminates knowledge to the public through Media.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
23.	My university education enhances the greater use of tacit knowledge.		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
24.	At my university experiences are shared through joint activities between teacher and learner.		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
25.	At my university knowledge is unstructured and crystallized through a process of reflection between sharing individual.		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
26.	At my university dissemination of knowledge is accomplished through knowledge carriers.		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
27.	At my university	the acquisition of knowledge takes place largely independently.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
28.	At my university	knowledge sharing is through conscious perception.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
29.	At my university	knowledge sharing is also through representations by action of unconscious mechanism.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

#	Items	Least Agree									Strongly Agree
		1	2	3	4	5	6	7	8	9	10
30.	My university is able to meet the challenge of attaining skill development in human capital.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
31.	Higher skills gained from university has the potential to raises the human capital.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
32.	Higher skills gained from university significantly influence life opportunities.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
33.	Higher skills gained from university helps in increasing the earning potential and draw mature individual toward knowledge society.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
34.	Skilled required at my university not only gain employment but also enhance the career within the organization.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
35.	My university encourages learning and development of research skills.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
36.	My university measures the develop the level of academic skills through development of measurement tools.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
37.	people learn self-management skills.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
38.	At my university generic skill development is adequate for development needs	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
39.	At my university people acquire the ability to deal with multiple issues and details.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
40.	At my university people are enabled to continually recognize and capitalize on employments and training opportunities.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
41.	My university teaches the ability to use analytical skills.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
42.	I am able to anticipate problems and invent ideas.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
43.	At my university people are able to learn and contribute knowledge to society.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

#	Items	Least Agree									Strongly Agree
		1	2	3	4	5	6	7	8	9	10
44.	At my university I am able to assess the knowledge gap in my area of study.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
45.	My university produces highly imaginative and innovative ideas and proposals.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
46.	I am able to perform and achieve, as well as demonstrate the capabilities gained from the university.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
47.	I gain sound decision making skills and am able to implement effective action from the knowledge gained from the university.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
48.	The university encourages effective performance in a complex and uncertain situation.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
49.	I am able to map the knowledge gained from my university.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
50.	I am able to implement the knowledge gained from my university.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
51.	I am able to improve upon the knowledge gained from my university.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
52.	I am able to absorb knowledge gained from the university	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
53.	I am able to recognize, value and acquire knowledge gained from my university.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
54.	I am able to transform knowledge for the benefit of society.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
55.	My well-developed abilities could Contribute Knowledge to the society.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
56.	My well-developed abilities could Communicate Knowledge to the society.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
57.	I can transfer my knowledge towards the achievement of national goals.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

#	Items	Least Agree									Strongly Agree
		1	2	3	4	5	6	7	8	9	10
58.	I am willing to learn knowledge that can be enhanced by long-term employment.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Governance										
59.	Governance is given equal weightage as of the core business of my university	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
60.	My university has the written guidelines on governance to ensure that all persons work in mutual cooperation.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
61.	In my university, the changes in governance allow external and internal stakeholders to participate in decision making or deliberations over important internal matters.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
62.	Faculty and students have a voice in the university's governance structure.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
63.	my university implements shared governance as an effective governing process.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
64.	My university provides value for money spent on education.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
65.	My university is able to demonstrate responsible and relevant expenditures when using taxpayer's money.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
66.	My university regularly assesses and evaluates the quality of its program and services.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
67.	My university identifies the public needs and responds accordingly.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
68.	Transparency Is a driving principle in managing the university.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
69.	Transparency of my university's administrative activities are guided by the principles of transparency.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
70.	Transparency is necessary condition for exercising control the university.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

#	Items	Least Agree									Strongly Agree
		1	2	3	4	5	6	7	8	9	10
71.	Transparency leads to enhance the university's contributions to society.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
72.	My university has systemic information to monitor activities	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
73.	My univsity has its own strategic plan for development.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Academic Quality										
74.	The academic quality of my university is guided by improvement-driven approach.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
75.	The academic quality of my university improves over a period of time.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
76.	My university's academic quality is systematic and structured.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
77.	My university's academic quality is continually improving	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
78.	My university's academic quality is upgraded and enhance its quality	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
79.	My university believes in safeguarding the social interests in upholding the standards of my university	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
80.	My university meets the standard to be approved as a research university	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
81.	My university has achieved its objectives and process effectively.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Culture										
82.	My university's aim of education is to develop individuals' full potential.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
83.	My university creates an environment where knowledge workers can develop the ethical commands with parity to mental development.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
84.	My university provides rich learning experience for its students.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

#	Items	Least Agree									Strongly Agree
		1	2	3	4	5	6	7	8	9	10
85.	My university provides a scholarly atmosphere where scholars contribute and implement the ideas for the country's development.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
86.	My university provides platform to learn the values of different Cultures	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
87.	My university provides platform to learn the values of different Beliefs	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
88.	My university provides platform to learn the values of different Norms	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Research										
89.	My university research activities help local business to develop products and services	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
90.	Investment in the research and development at my university creates new product and new intellectual property.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
91.	Research through my university creates the opportunity not only for individuals but also for industry, region and country.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
92.	My university research activities are generally an integral part of the knowledge creation process and generate new knowledge areas.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
93.	Research and development through my university is positively related to the economic and knowledge development of the country.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Innovation										
94.	Innovation helps my university to generate income for the university.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
95.	Openness to external environment improves my university's ability to innovate	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
96.	My university provides a platform for innovation with support from industry.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

#	Items	Least Agree									Strongly Agree
		1	2	3	4	5	6	7	8	9	10
97.	My university play platform for innovation with support from the government.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
98.	My university encourage innovation.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
99.	My university offers infrastructure for innovation.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
100.	My university encourages patenting of products and services.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
101.	My university is unwilling to change attitudes and practices. This is an obstacle for innovation	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
102.	My university decision makers plan and strategize for technology innovations.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
103.	My university process and structure influence the adoption of and diffusion of technological innovations.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
104.	My university allows teaming with industry for the technological innovations.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
105.	Freedom to be creative at my university generates technology innovation through partnering with industry	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
106.	At my university technological innovations lead to entrepreneurial success.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
107.	My universityeducation readies me for the practical / real world.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
108.	My university promotes how realities can be changed to create new values	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
109.	My university education is inspirational.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
110.	Creative teaching and presentation techniques are important in a university.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

#	Items	Least Agree									Strongly Agree
		1	2	3	4	5	6	7	8	9	10
111.	I am benefiting from the programs offered by my university.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
112.	Curriculum innovation is crucial for educators to adapt and develop expert teaching and learning activities.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
113.	My university curriculum development is innovative.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
114.	My university needs innovative degree program to fulfill the needs of knowledge workers.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
115.	My university professional degrees are innovative and design for knowledge workers.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Infrastructure										
116.	My university facilities support its community: faculty, students and staff, to help carry them their given task / assignment.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
117.	My university good physical infrastructure presents the aesthetic social and culture aspects of institutional culture	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
118.	My university infrastructure facilities are accessible to the physically challenged students.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
119.	My university the availability of computers, local area network, Internet	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
120.	My university is connected with electronic Whiteboards and other teaching facilities	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
121.	My university has software – both general and subject specific: learning management systems, assessment tools, etc.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
122.	My university supplies infrastructure needs and address such issues.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

#	Items	Least Agree									Strongly Agree
		1	2	3	4	5	6	7	8	9	10
123.	My university ensures adequate availability and access to research instruments and lab.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
124.	My university upgrades and maintains research instruments/labs and related facilities	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
125.	My university has sufficient funding for new research projects.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
126.	Availability of digital library, research database at my university is sufficient.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Information and Communication Technology (ICT)										
127.	ICT facilities at my University are adequate and continually upgraded	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
128.	ICT Facilities at my university enhance the teaching and expands learning opportunities.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
129.	ICT Helps my university in improving its curriculum.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
130.	ICT helps improve the quality of educational achievements and reforms	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
131.	ICT Levels promote equity and inclusive education at my university.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
132.	ICT enhances learners employability and for the diversity of life skills	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
133.	ICT integrate education with private partnerships	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Thank you for help and support and please send me back on this email id:

tenzin.nida@gmail.com

BIOGRAPHY

NAME	Mr. Tenzin Rabgyal
ACADEMIC BACKGROUND	Bachelor of Arts (Geography Hons.); Government College for Men, Panjab University, Chandigarh, India; Master of Arts (Economic); Panjab University, Chadigharh, India; MBA- International Business, Asian Insitute of Technology, Thailand; Post Graduate Diploma in Sales and Marketing Management (PGS&MM), Bhartiya Bhawan, India; Certificate Asia-Europe Study, Science-Po, Paris, France.
PRESENT POSITION	Coordinator, Admissions and Scholarship Office, Asian Institute of Technology
EXPERIENCE	Over 17 years of working experience in Academic Institute as a Administrator and Adjunct Faculty in Thai Universities, such as Rajamangala University Technology Thanyaburi, University of Thai Chamber of Commerce and Sripatum University; Two year of corprorate experience as Marketing executive, Peru Group of Companies, India
AWARD	Partial Support from Hedgebrook Foundation and GSPA- NIDA for Doctoral Study
CONTACT	Email: tenzin.rabgyal@gmail.com