

National Graduate Conference 2012

KEYNOTE ADDRESS

Promoting Innovation and Excellence in Research

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Abstract: In this keynote, I would like to draw the participants' attention on their roles in addressing the issues and challenges of promoting innovation and excellence in research at the international, national, organizational and individual levels.

Keywords – Innovation Ecosystem; Grassroots Innovation; Research Excellence; Cycle of innovation; R&D Priority Areas

I. INTRODUCTION

In this inaugural gathering of National Graduate Conference 2012, I have been given the honor to share my thoughts on the challenges that we face in promoting innovation and excellence in research. As we explore the challenges at the macro and micro levels--international, national, organisational and individual levels--I would like to pose questions for you to ponder in your different capacities as engineers, researchers, scientists, entrepreneurs, and students on what roles you can play to promote innovation and excellence in research in your universities, communities, companies and nations.

II. INTERNATIONAL LEVEL

Coincidentally, NatGrad2012 is being held the same week of the World Innovation Forum WIF-KL, 1 to 7 November 2012 with the theme "Inclusive Innovation for Transformation" [1]. Organised by MOSTI and Malaysian Innovation Foundation (YIM) with a distinguished list of partner sponsors and co-organisers, WIF-KL was attended by 1500 international delegates from 50 countries with four core events, namely KL Innovation Forum 2012, BioMalaysia 2012 Conference and Exhibition, NanoMalaysia Summit and Expo 2012 and the National Innovation Conference and Exhibition (NICE) 2012 and eight satellite events. The World Innovation Expo showcased grassroots innovations and from the education, research, services and industry in the cycle of innovation: from grassroots to schools, to universities and research institutions then back to the community. Jejak Inovasi [2] promoted knowledge sharing among inventors and subject matter experts.

Given the current global socioeconomic climate and the emphasis for sustainable development, WIF-KL addressed key drivers and unique issues surrounding policies,

framework strategies and best practices of innovative nations for all members of society, including the bottom billion. During the opening dialogue session on "Invent, Innovate, Commercialize", the discussants deliberated on topics covering the future trends of innovation, the role of the financial sector, financial innovation in promoting SMEs, social innovation and innovative solutions to climate change, sustainable energy sources for a green and clean 21st century. One of the speakers Dr. Kevin O'Brien, Director of Energy Practice, Global Innovation Solutions developed programs that couple engineering schools with business schools to encourage entrepreneurial activities in a university setting.

You may ask, what is the relevance of WIF-KL to you--engineers, researchers, scientists, entrepreneurs, and students? The question I am trying to highlight here is that with the 116 papers presented at this NatGrad Conference:

Q1. How many of us fit into the global movement towards inclusive innovation for transformation?

III. NATIONAL LEVEL

Innovation Model and Ecosystem Framework

Malaysia must become an innovation-led economy driven by a new breed of SMEs and entrepreneurs in order to create income growth and become a high income economy. To achieve this, innovation has been identified as the main mechanism to improve Malaysia's competitiveness and to attain the objectives of the New Economic Model and the 10th Malaysia Plan [3]. In 2007, the National Innovation Model was unveiled calling for wealth creation and social well-being via market-driven and technology-driven innovation economy for Malaysia. The quest for innovation-led economy is further substantiated with the establishment of the Special Innovation Unit (Unit Inovasi Khas or UNIK) under the Prime Minister's Department in July 2010 to strengthen the strategy and policy in promoting innovation in Malaysia and complement the National Innovation Centre [3]. The government's initiative to encourage Malaysians to acculturate innovation and creativity was accentuated with Innovative Malaysia Year 2010, Year of Science 2011 and Year of Innovation 2012.

As shown in Figure 1, innovation-led economy demands a new breed of SMEs and entrepreneurs to create income growth via market-driven and technology-driven innovation [3]. Unlike traditional SMEs, the new Innovation SMEs (I-SMEs) need to manage risks associated with market-driven and technology-driven innovation, namely technology risk, funding risk and market risk. Therefore, under the Innovation Model, government support was identified to mitigate these high risks in order to achieve a critical mass of this new breed of I-SMEs, especially in ICT, biotech and other growth areas.

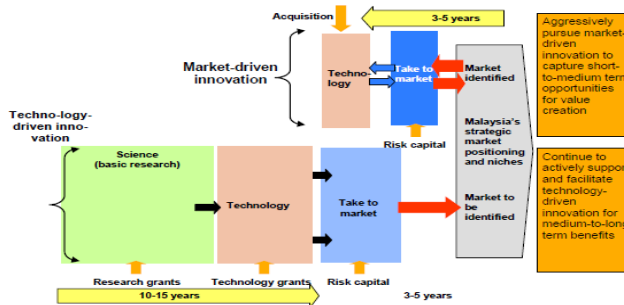


Figure 1. The Balance Approach of Market and Technology Driven Innovation adopted by Malaysia [3]

Under the SME Masterplan 2011-2020, 37% of GDP or RM 15.6 billion stimulus package was earmarked involving 56,000 SMEs. To promote green technology, RM1.5 billion was set aside and tax deduction on expenses occurred in registration of patent and trademarks. This would lead to expected growth in industries such as tourism, ICT, Finance & Islamic banking, Halal & green technology and creative industry (RM200 million – film, drama, music, animation, advertisement and local content development).

To support innovation, Al-Idid (2008) presented the national innovation ecosystem framework drawing from *Innovation Vital Signs* [4]. As shown in Figure 2, innovation is best viewed as an ecosystem of relationships, connections and diverse pattern interaction among individuals and organisations. It is a complex process in which new knowledge eventually becomes embedded in a new product, service, process or business model that creates value.

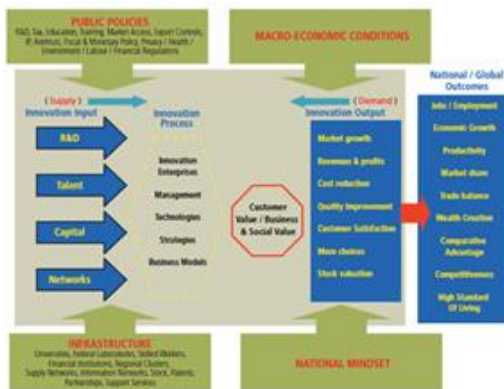


Figure 2. National Innovation Ecosystem Framework [4]

This innovation ecosystem framework is comprehensive and holistic in that it recognizes that the national innovation system is being shaped by external factors, primarily the public policy environment, linkages to the national innovation infrastructure, national mindset and macroeconomic environment. Whereas the linear and systemic models of innovation were the first and second generation innovation policies, this ecosystem framework is the third generation in which innovation policy constitutes a process, and to examine its institutional, structural and political characteristics. The framework operates on the principle that the demand for innovation is formed by applications that create customer value and subsequently, it is the customer value and receptivity to innovation that will determine the rate of diffusion in the economy [4]. From this framework, it can be observed that innovation is not based just on research, science or technology but that innovation can be of a non-technological nature involving management, strategy, business process reengineering, training, cultural change and reorganised information systems, among others. Thus, the question arises for us to ponder:

Q2. How do you see yourself in the National Innovation Ecosystem?

IV. ORGANISATIONAL/UNIVERSITIES

Research and Development (R&D) Initiatives

The R&D initiatives for Malaysia began with the ‘National Higher Education Strategic Plan (NHESP)’ launched in 2007. Research, development and innovation aimed at increasing knowledge, discovery and commercialisation of new products are a priority in Phase 2 (2011-2015) of the NHESP. To boost R&D and innovation, steps have been taken:

- to encourage a pioneer mindset among researchers;
- encourage innovative research in line with the requirements of nation;
- translate findings to products or platforms that can be commercialised; and
- enrich the knowledge repository of the country [5].

Further, several strategies were highlighted at the recent ‘Conference on Institutional Perspectives on Evidence-Based Research Evaluation 2012’ [6] including:

- the Research University (RU) programme and its impact on driving Malaysia’s R&D excellence initiatives;
- the Higher Institutions Center of Excellence (HiCOE) programme where more HiCOE will be established on the basis of mutual understanding and collaboration. The six existing HiCOE has begun collaboration with world renowned research institutes; and
- management of research funds-Fundamental Research Grant Scheme (FRGS), Exploratory Research Grant Scheme (ERGS), Long-Term Research Scheme (LRGS) and Prototype Development Research Grant Scheme (PRGS) under the 10MP to enliven the landscape of R&D and increase commercialization.

Passion and dedication towards research will also be inculcated, and increased collaboration and funding enhanced to improve R&D output e.g. commercialisation of at least 5% of R&D efforts and producing five world renowned R&D centres of excellence with the aim of creating internationally-acclaimed research universities. In 2012, five research universities (UM, UKM, USM, UPM and UTM) were conferred autonomy by the Minister of Higher Education to act with full accountability and responsibility on matters related to administration, academic management, student intake, institutional governance, finance and human resource management [5]. All five research universities have been instructed to intensify efforts to spearhead high-impact research platforms. UNITEN recently was conferred SETARA 5 Excellent, a good indication that it is moving towards becoming a research university. Herein lies the next question for the engineers, researchers, scientists, entrepreneurs, and students in this conference today:

Q3. Where do you see yourself in the National Higher Education Strategic Plan?

R&D Priority Areas

At the national level, the Malaysia government has mandated nine R&D Priority Areas to be used as a guide by the granting agencies such as MOHE for FRGS, ERGS, LRGS, and PRGS and MOSTI for e-ScienceFund as shown in Table 1. One of the challenges for universities is balancing between the need to secure funding that meets the national agenda and academic freedom to do research that may not fall in these priority areas. Researchers, scientists, engineers, and students need to find a niche and gear their research to match these priority areas as well as to source out international grants for collaborative research. Hence, the question to you:

Q4. Does your research fall in these Priority Areas?

Table 1. Malaysian R&D Priority Areas

Priority Areas	Scope
Biodiversity	Exploitation of Malaysian biodiversity to address the following issues identified and anticipated.
Cyber Security	Development of national autonomous and secure systems to reduce the dependency on foreign for systems of strategic importance.
Energy Security	Harnessing alternative resources and improving the efficient use of energy especially in the areas of renewable energy to reduce dependency on fossil fuel.
Environmental & Climate Change	Supporting ecosystem management, protection and improvement to mitigate flood, drought & air pollution as well as promotion of eco-tourism for sustainable development.
Food Security	Improvement of food crops, livestock, fisheries & animal feedstock; focusing on post-harvest physiology & technology to

	reduce dependency of import on staple food and increase the level of self- sufficiency.
Medical & Healthcare	Improving health, wellbeing & longevity through the diagnostic, prevention & treatment of lifestyle diseases as well as new and emerging diseases.
Plantation Crops & Commodities	Creating sustainable plantation crops and commodities sector by increasing the productivity and utilization, focusing on oil palm, timber, rubber, cocoa & pepper.
Transportation & Urbanisation	Reduce dependency of fossil fuel & enhance energy efficiency by focusing on the use of alternative energy & design engineering. Ensuring sustainable urbanization via efficient urban waste management.
Water Security	Ensuring sustainable water supply & optimizing water usage focusing on creating sustainable sources and improving the processing, treatment & distribution of water

Research Excellence

Times Higher Education (*THE*) looks at innovation via the income a university derived from its work with industry, showing a clear signal of its strength in knowledge transfer. *THE* places emphasis on the university's ability to place research papers in top journals, its record in publishing highly cited research, its reputation for research excellence among academics around the world and its ability to attract research funding. These indicators are essential to any nation serious about pushing forward the boundaries of understanding and being part of the knowledge economy [7]. A recent workshop on "Finding Meaningful Performance Measures for Higher Education" [6] highlighted indicators of institutional research performance:

- Thomson Reuters Web of Science® database - Malaysia has increased its research output with an almost three-fold increase in papers produced from 2006 to 2010.
- Thomson Reuters Essential Science IndicatorsSM - Malaysia ranks as third after Singapore and Thailand by number of top 1% of Highly Cited Papers published worldwide amongst the six ASEAN countries. However, by ratio of Highly Cited Papers against total output, Malaysia ranks the lowest.

According to Dr Wong Woei Fuh, Managing Director Asia, Thomson Reuters, "this indicates that Malaysia is not lacking in talent and with careful planning of resources to manage research performance, universities and research institutions can fully reach their potential to achieve **world-class research excellence**. If they were to evaluate their research performance using **quantifiable metrics**, they would be better able to benchmark their performance against indicators of institutional research performance that they find relevant to their strategic objectives" [6]. Thus, the question for all of us to ponder:

Q5. Are we writing and publishing smart?

V. INDIVIDUAL LEVEL

According to the National Higher Education Strategic Plan 2011-2015, efforts has been intensified to increase the number of researchers, scientists and engineers (RSE) at a ratio of 50 RSEs per 10,000 workforce. To the engineers, researchers, scientists, entrepreneurs, and students in this conference, I ask:

Q6. Do you see yourself as part of this capacity building and nation building?

In closing, going back to the WIF-KL, several awards were presented and showcased at the World Innovation Expo, namely:

- a) National Innovation Award (AIN) 2012 (categories: products, services, grassroots and schools),
- b) National Young Scientist Award 2012,
- c) National Technologist Award,
- d) Grassroots Innovator Awards (categories: open, youth, women, Kids Invent! Innovative Family Award)
- e) BioInnovation Awards,
- f) CIPTA Awards

With the myriad of awards to recognize innovative and creative effort towards generating ideas, new innovation and products by harnessing science and technology towards impacting national economic development and societal wellbeing, the final question is:

Q7. Are you aware, and would you qualify for these awards?

III. CONCLUSION

In this keynote, I have presented to you the challenges at the macro and micro levels--international, national, organisational and individual—that lay before us in promoting innovation and excellence in research. I leave you with seven questions to ponder—in your different capacities as engineers, researchers, scientists, entrepreneurs, and students—on your roles in promoting innovation and excellence in research in your universities, communities, companies and nations. I wish you good luck in your future endeavors.

ACKNOWLEDGEMENT

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REFERENCES

- [1] <http://www.wifkl.com>
- [2] <http://www.YIM.JejakInovasi>
- [3] Ahmad, Z. A. (2011, June). Creativity and Innovation: A Leadership Imperative. Professorial Lecture Series, UNITEN, ISBN 978-967-5770-13-5.
- [4] Al-Idid, S. N. K. (2008, 24 March). Technological vs National Innovation: Identifying Factors that Drive Innovation. Bizedge, p. 4-6.

- [5] Higher Education in Malaysia (n.d.). Accessed from: http://www.studymalaysia.com/education/art_education.php?id=nationaledu2
- [6] How Measuring Research Performance Based On Evidence Can Lead Malaysia To World-Class Research (2012, July 5). Accessed http://umnews.um.edu.my/highlights-view.php?news_id=122
- [7] Baty, P. (2011, 10 May). Research is not the only measure of excellence Accessed from: <http://www.timeshighereducation.co.uk/world-university-rankings/#bySubjectNav>