

# SOME INITIATIVES IN SUSTAINING OUTCOME BASED ENGINEERING EDUCATION & ACCREDITATION AND RESEARCH IN MALAYSIA

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# Outline of Presentation

- ▶ 9 Large Projects in Malaysia
- ▶ Brief History of Accreditation & Expectation on HEI
- ▶ Pertinent Background Information
- ▶ Capacity Building
- ▶ Research Supporting OBE Initiatives

## 9 Large projects in Malaysia

Similar to Pakistan, the following large projects are under construction or expected to be completed by 2026 (6.35 min. Video at [www.youtube.com/watch?v=P4IH5qWQ9Ds](https://www.youtube.com/watch?v=P4IH5qWQ9Ds))

- ▶ **Tun Razak Exchange:** A World Class Financial District in KL offering residential, commercial, retail and office space. Tower will be 492m tall, higher than the Petronas Twin Towers and expected to be completed this year . MYR40 billion
- ▶ **Penang Sentral:** A Multimode Transport Hub encompassing ferries, rail, taxi & bus systems.
- ▶ **Melaka Gateway:** 12 Entertainment Precincts including cruise terminal & mall, historical walk and heritage promenade
- ▶ **Iskandar Forest City:** Luxurious Residential Development for 700,000 people

## 9 Large projects in Malaysia

- ▶ **High Speed Railway KL-Singapore:** Expected completion in 2026 including the construction of 7 stations and bridges. MYR21 billion
- ▶ **Century Fox World:** Entertainment and resort development. 10 acres in size including thrill rides & shopping malls to be completed in 2018
- ▶ **Pan Borneo Highway:** More than 5000 km long spanning the East Malaysian states of Sarawak & Sabah and Brunei. Currently under construction
- ▶ **East Coast Rail Link:** KL-Kota Bahru linking East and West Coast of Peninsular Malaysia. Elevated railways 668 km, 10 tunnels 18.7 km, longest tunnel 5.6 km. Under construction
- ▶ **Merdeka PNB 118:** Hotel, office and retail megaskyscraper development. 80 storeys 630 m tower when completed in 2024 will be third tallest in the world

# Brief Accreditation History of Engineering Programmes in Malaysia

- ▶ Prescription based accreditation since 1950s
- ▶ Outcome Based Accreditation
  - Provisional signatory to WA 2004
  - Admission to full WA signatory status 2009
  - Renewal of status for a further 6 years 2016
  - Application for Sydney Accord (SA) & Dublin Accord (DA) 2016. Anticipated admission 2018
- ▶ Phased Implementation & Expectation of Performance on HEI
  - 1999-2005: Sufficient if HEI have OBE plans and infancy implementation
  - 2006-2012: HEI implement OBE in a systems approach.
  - 2013-2019: Efficacy/ Efficiency/ Effectiveness of OBE systems at HEI
  - 2020: OBE at HEI is de riguer

# Pertinent Background Information

- ▶ All undergraduate and some postgraduate programmes are OBE
- ▶ By Act of Parliament, professional programmes e.g. engineering, accountancy, medicine, architecture etc. are accredited by the appropriate responsible bodies to attain the minimum standard comparable to global practice
- ▶ Other non-professional programmes are accredited by the Malaysian Qualifications Agency (MQA)\*.
- ▶ Various initiative undertaken as components of the National Blueprint in Education in the National Transformation Agenda

\* The MQA is a statutory body in Malaysia set up under the Malaysian Qualifications Act 2007 to accredit academic programs provided by educational institutions providing post secondary or higher education. The (MQA), a statutory body under the purview of the Ministry of Higher Education Malaysia (MOHE), administers the Malaysian Qualifications Framework (MQF) which is a unified system of post secondary qualifications offered on a national basis in Malaysia.

# Capacity Building

- ▶ National Level:

The establishment of the Higher Education Leadership Academy (AKEPT), which is an organization under MOHE in January 2008, as a referral centre in the area of human capital development for research & innovation, teaching & learning (T&L), and leadership competencies for higher education.

Learning and teaching circles (A-LTC) are formed to provide training workshops periodically to academics e.g. Project Oriented Problem Based Learning (PoPBL), Teaching using the Modular Approach, Leadership in Technology Transfer Centres etc.

- ▶ HEI Level:

The establishment of in-house centres of academic development to provide training in T&L and research innovation supporting OBE. E.g. Centre for Academic Development (CADE) at UPM, Centre for Engineering Education at UTM.

Sample workshops at CADE

Outcome Based Education: Curriculum Design

Immersive Learning Through Cybergogy

Fundamentals of Teaching Course SERIES 1/2018

# Capacity Building

- ▶ Improvement made at Engineering Accreditation Dept. (EAD), Board of Engineers Malaysia.

Restructuring of ADs make-up. Where previously, 1 Director and assisted by 4 Associate Directors. Now, 7 ADs for the portfolios in the engineering disciplines of Civil & Structural, Manufacturing & Materials, Mechanical, Electrical, Electronics & Chemical, and International Affairs. Restructuring in accordance with expansion of duties & to make it more aligned to current needs and specifications.

The need for continuous capacity building and the preparation of succession plan in the infusion of “fresh blood” as accreditors. This becomes more critical as earlier pioneering panels reached retirement age and/or moved to higher management positions. They no longer have the luxury of sparing time for accreditation visits. There is always a need to invest in new/ young starting academics to be trained as accreditors and always on the lookout for more input & interaction from people in industry.

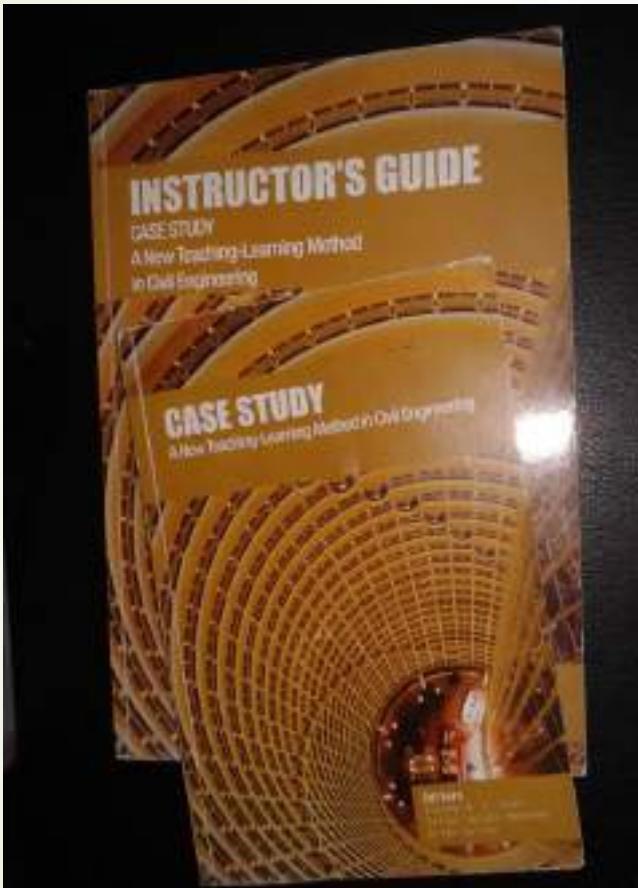
Manual updates to keep abreast of development and innovation in engineering education every 5 years

Online submission of all documents associated with accreditation from Self Assessment Report to Decision

# Capacity Building

- ▶ Other informal training by learned societies, commercial entities and international experts at:
  - 2<sup>nd</sup> International Engineering Convention 2007 by Federation of Institution of Engineers in Islamic Countries (FEIIC) usually held biennially now known as FEIIC Conf. on Eng. Education & Research (FICEER) and last held at Madinah in 2017
  - Occasional workshops by Institution of Engineers Malaysia (IEM) & Malaysian Society of Engineers and Technologists (MySET)
  - Invited international experts for workshops & talk for e.g. “Effective College Teaching” by Prof. Richard M. Felder & Rebecca Brent 14-15 Dec. 2005 at UTM, Skudai

# Publication on Capacity Building



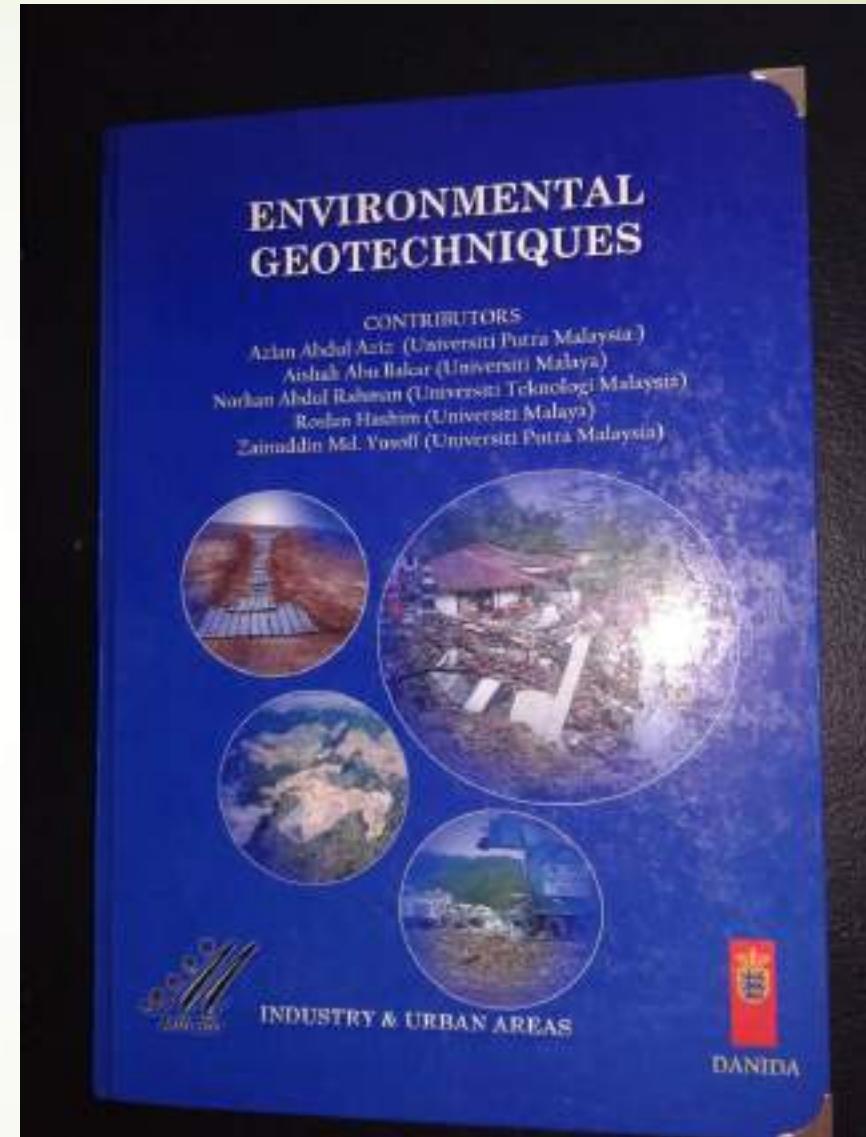
- ▶ For Students & Instructors of the Case Study Method
- ▶ Book published by  
Department of Higher Education,  
Ministry of Higher Education,  
Putrajaya, Malaysia 2011  
ISBN 978-967-344-224-9

## Teaching Module

Published by Malaysian University Consortium for Environment and Development – Industry and Urban Areas (MUCED-I&UA)

ISBN 983-2904-05-6

A project with the aid of Danish International Development Agency (DANIDA)

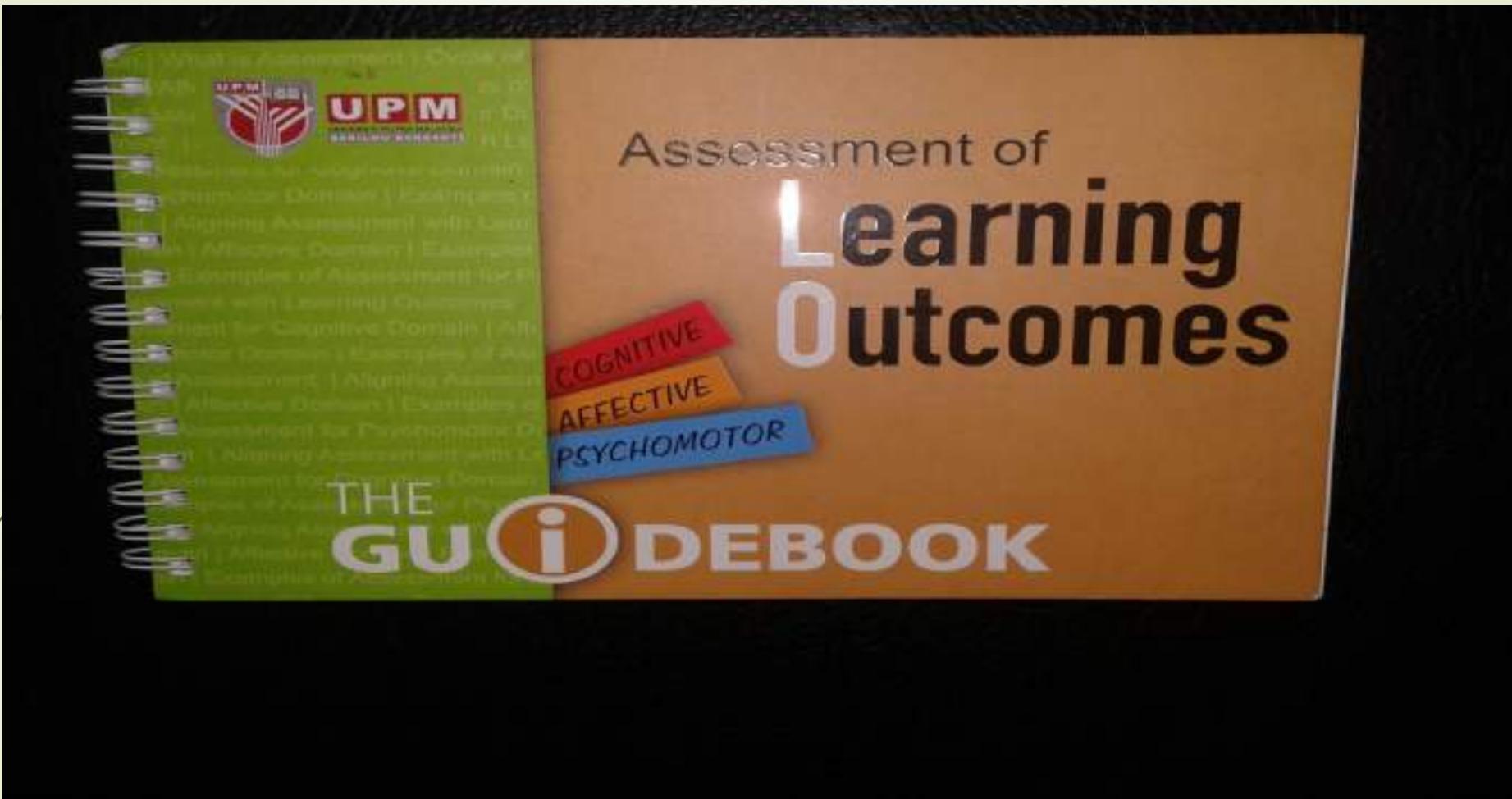


## Training Manual in Workshop

Published by MySET Edition 2013

Training manual to assist HEIs in preparing Self Assessment Report for accreditation





Guidebook published by Centre for Academic Development, Universiti Putra Malaysia (UPM) 2013 ISBN 978-967-960-331-6

# Enabling Research Supporting OBE Initiatives

- ▶ Research findings support T&L
- ▶ Funds are made available specifically for research in Engineering Education to
  - produce publications in refereed journals & high impact journals
  - disseminate findings at conferences & workshops
  - publish books or chapters in books
  - produce patents and product / technology that can be commercialized
  - bridge the gap between research discovery and commercialization
- ▶ Nationally e.g. Fundamental Research Grant Scheme(FRGS); @ University
  - e.g. PUTRA Research Grant Scheme

## Software product that is commercialized

A system to administer an outcome based education

Patent granted in Japan (2016) & Malaysia (2017)

Patent filed in 2011 and pending in Australia, USA and India



# Recognition of Champions

- ▶ Considered for promotion; good teacher pathways as opposed to other paths of being excellent in research or administration or recognized expert internationally or in industry
- ▶ Awards at faculty, university and ultimately nominated for national award. Gets cash, celebratory event, national TV etc....

# Conclusion & Recommendation

Since the introduction of OBE & OBA, many initiatives have been undertaken by Malaysian HEIs and other vested institutions. Current anxiety is to devise a curriculum to prepare graduates for the 4<sup>th</sup> Industrial Revolution/ Disruptive Technology.

It is suggested that the conference consider the following recommendations:

- ▶ Apply for Sydney & Dublin Accord in consonant with the concept of "The Engineering Team" comparable to global practice
- ▶ Research funds to be made available to support T&L activities and sustain OBE initiatives at National & HEI Levels
- ▶ Encouragement towards the establishment of Centres of Academic Development at National & HEI Levels
- ▶ The creation of a conducive atmosphere and recognition of academics' contribution to OBE, OBA & T&L activities. E.g. Awards & Promotion
- ▶ Publication of materials to support T&L activities at HEIs
- ▶ Training workshops targeted at a more focused groups.



THANK YOU