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International Accreditation of Engineering Qualifications

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International Science, Technology and Innovation Centre for South-South Cooperation under the auspices of UNESCO
Successful Outcome of the 2nd Summit of China+G77 in Doha 2005.

The Summit urged UNESCO to balance initiatives on the Supply Side of S&T with more initiatives on the Demand Side for the benefit of peoples in South countries.

UNESCO approached Malaysia to host ISTIC as a Category II Centre in 2006. UNESCO Category II Centre is funded by host nation. Malaysian government agreed.

A Six-Year UNESCO-Malaysia Agreement was signed in January 2008.

ISTIC was formally launched in Kuala Lumpur on 22 May 2008.
ISTIC has emphasized programs on Institutional and Human Resources Capacity Building in South Countries.

ISTIC Priority Programs:

- **STI Policy**, emphasizing national STI Policy formulation, implementation and monitoring, including the role of women in STI;
- **Inquiry Based Science Education (IBSE)/Science, Technology, Engineering and Mathematics (STEM) Education**;
- **Maintenance of Infrastructure**;
- **Technopreneurship Training**.
Professional engineers formed Learned Societies now known as National Institutions/Societies of Engineers, starting from more than one hundred years ago, to keep abreast of the development in the art and science of engineering.

As the Practice of Engineering spread across national boundaries, regional federations of national institutions of engineers were formed like the Commonwealth Engineers Council (CEC), the Federation of Engineering Institutions in Asia and the Pacific (FEIAP), ASEAN Federation of Engineering Organisations (AFEO), to name but a few. Finally the World Federation of Engineering Organisations was established in 1968, UNESCO was instrumental in the establishment of WFEO and FIEAP.

I was WFEO President 2003-2005 and CEC Chairman 1993-2000,
With Queen Elizabeth II at Commonwealth Engineers Council 50th Anniversary Celebration, Institution of Civil Engineers London March 1996
Commonwealth Day 8 March 2010 Commemoration Service “S&T and Society” at Westminster Abbey London

Dato Ir. Lee Yee Cheong Reading the Lesson in front of Distinguished Congregation headed by HM Queen Elizabeth II, Prince Philip and Prince Charles
Dato Ir. Lee as member of UN Millennium Project team with UN Sec-Gen Kofi Anan
Since the practice of engineering has societal impacts, National Institutions of Engineers realized that they must regulate the practice of engineering to safeguard life and property in the following ways:

- The accreditation of engineering educational qualifications to assure educational standards.
- The provision of continuing professional development (CPD) programmes to assure the knowledge of professional engineers is up to date.
- The requirement for professional engineers to abide by the Code of Ethics including codes concerning the environment and sustainable development.
National Institutions of Engineers, being NGOs, lack legal powers to enforce good engineering practice. The utmost punishment is expulsion from membership.

The more established National Institutions of Engineers then helped governments to establish Engineering Councils or Boards of Engineers with legal powers:

- to compel institutions of higher learning to subject their engineering courses to compulsory accreditation,
- to compel professional engineers to register for professional practice with the accredited educational qualification and certified professional experience after graduation,
- to compel professional engineers to satisfy the prescribed annual CPD for renewal of the practice licence,
- To subject errant professional engineers to legal action.
The most established and influential national institutions of engineers and boards of engineers of the English speaking world, namely Australia, Canada, Ireland, New Zealand, UK and USA first got together to draft a common guide for accreditation of engineering educational qualifications.

This is the famous Washington Accord (WA) which is the de facto international standard for engineering educational qualifications in the World. WA was signed in 1989.

WA recognises substantial equivalence in the accreditation of qualifications in professional engineering, normally of four years duration.

In WA, only Signatories have full rights of participation in the Accord; qualifications accredited or recognised by other signatories are recognised by each signatory as being substantially equivalent to accredited or recognised qualifications within its own jurisdiction.
The modus operandi of WA is that each Signatory is autonomous in the accreditation of engineering qualifications within its jurisdiction subject to WA standards, periodic assessment and monitoring visits and WA reviews.

From 1989 to date, below are WA signatories:

**Australia** - Represented by **Engineers Australia (1989)**

**Canada** - Represented by **Engineers Canada (1989)**

**Chinese Taipei** - Represented by **Institute of Engineering Education Taiwan (2007)**

**Hong Kong China** - Represented by **The Hong Kong Institution of Engineers (1995)**

**Ireland** - Represented by **Engineers Ireland (1989)**

**Japan** - Represented by **Japan Accreditation Board for Engineering Education (2005)**

**Korea** - Represented by **Accreditation Board for Engineering Education of Korea (2007)**

**Malaysia** - Represented by **Board of Engineers Malaysia (2009)**

**New Zealand** - Represented by **Institution of Professional Engineers NZ (1989)**

**Russia** - Represented by **Association for Engineering Education of Russia (2012)**

**Singapore** - Represented by **Institution of Engineers Singapore (2006)**

**South Africa** - Represented by **Engineering Council of South Africa (1999)**

**Turkey** - Represented by **MUDEK (2011)**

**United Kingdom** - Represented by **Engineering Council UK (1989)**

**United States** - Represented by **Accreditation Board for Engineering and Technology (1989)**

**Sri Lanka** - Represented by **Institution of Engineers Sri Lanka (2014)**

**India** - Represented by **National Board of Accreditation of All India (2014)**
Organisations holding WA provisional status are:

- Bangladesh - Represented by Board of Accreditation for Engineering and Technical Education
- Germany - Represented by German Accreditation Agency for Study Programs in Engineering and Informatics
- Pakistan - Represented by Pakistan Engineering Council
- Peru - Represented by ICACIT (2014)

As admission of a new signatory requires unanimous approval of all WA signatories, WA gives the unmistakable impression of an exclusive club keeping out from membership of many other countries especially developing countries.

It is amazing that a group of engineering organisations from a few countries are keeping the rest of the developing world at bay. [http://www.washingtonaccord.org/](http://www.washingtonaccord.org/)

This said, I can attest to the thoroughness of WA appraisal processes and missions being a member of WA mission in accreditation of bachelor of civil engineering degree of the National University of Singapore in 2005.
This WA exclusive club like methodology has led quite naturally to regional initiatives outside WA to realise regional accreditation of engineering qualifications especially for South countries.

The most significant and progressive is that of the Federation of Engineering Institutions in Asia and the Pacific (FEIAP). Professor Datuk Dr Chuah Hean Teik of Malaysia is the current FEIAP president and IEM holds the FEIAP secretariat. FEIAP member organisations especially members of WA are nurturing other members to adopt the FEIAP Guidelines for accreditation of engineering educational qualifications to international standards. I believe this is a most commendable and achievable initiative as the economies of Asia Pacific become more and more closely knit. [http://feiap.org/doc/FEIAP%20Engineering%20Education%20Guidelines.pdf](http://feiap.org/doc/FEIAP%20Engineering%20Education%20Guidelines.pdf)

WA has made their guides and manuals for accreditation of engineering qualifications available. WA has also prepared the model guides for accreditation of technologists and technician engineers in the Sydney Accord 2001 and the Dublin Accord 2002 respectively.

Relevant Signatories of WA had also signed agreements covering competence standards for practising engineers like the APEC Engineer Agreement in 1999.
The prerequisite for regulation of professional engineering practice including international accreditation of engineering qualifications in any country is the existence of a competent National Board of Engineers or Engineers Registration Board.

ISTIC has provided the necessary South-South Cooperation platform. As an example, ISTIC arranged for the Engineers Registration Board Kenya, the Engineers Registration Board Tanzania and the Council for the Regulation of Engineering Nigeria (COREN) to send top level delegations to Malaysia and exchanged views with the Board of Engineers Malaysia (BEM), the Institution of Engineers Malaysia (IEM) and the Construction Industry Development Board Malaysia (CIDB).
Malaysia have shared our national and ASEAN practices and experiences with them. This S-S cooperation is continuing as African engineers look East.

Due to their visits to Malaysia, there has been rapid progress in the initiative of accreditation of engineering qualifications to international standards in the East African Economic Community (EAEC) by the Engineers Registration Boards (ERBs) of EAEC member nations. In both ASEAN and EAEC, established ERBs are assisting in the establishment of ERBs in other member nations.

ISTIC will act as the South-South cooperation conduit to promote the formation of ERBs in South countries.
The successful accreditation of engineering education qualifications is also the first essential step towards the mobility of professional engineers across regional economies. This requires collective regional political will. The outstanding example is the European Union.

ASEAN has also progressed very far in having member governments signing the mutual recognition agreement (MRA) of engineering qualifications and certification of engineering experience. Under the ASEAN MRA, the ASEAN Engineer Register has been established and the “ASEAN Engineer” designation is much valued. However, only half of the ten member countries of ASEAN have established national Board of Engineers/Engineering Council.

IEM is the Secretariat of the ASEAN Federation of Engineering Organisations (AFEO). AFEO has been responsible for the ASEAN MRA and the ASEAN Engineer Register. I must acknowledge that both the ASEAN MRA and the ASEAN Engineer Register have been based on the pioneering work of WA and the APEC Engineer Agreement.
The Role of UNESCO

UNESCO is the acknowledged and undisputed global custodian in Education and Culture.

However in Science and Technology, there are many UN organisations and specialised agencies in charge of specific arena of science and technology like FAO in food and agriculture, WHO in medicine and health care, UNEF in environment, WMO in climate change, ITU in ICT, UN HABITAT in urban planning, and UNIDO in industry and technology etc.

However, global engineering is undoubtedly UNESCO’s turf. I have mentioned FEIAP and WFEO being established by UNESCO before. WEFO head office is in UNESCO Paris.
The assumption of the intergovernmental leadership in accreditation of engineering qualifications is in line with UNESCO’s engineering initiative for Africa. It will be a great service to the engineering profession in Africa and other South countries.

I submitted my proposal for UNESCO to assume the global role in accreditation of engineering educational qualifications to HE UNESCO Director General Irina Bokova in person during ISTIC 5th Anniversary Celebration Conference in May 2013 Kuala Lumpur which she came to officiate.
HE UNESCO D.G. Irina Bokova Delivering Keynote Address at Opening 22 May 2013
I informed her and UNESCO A.D.G. for Natural Sciences, Dr. Gretchen Kalonji that everything was in place by the professional engineering community using the WA guideline and methodology. What is needed desperately by the developing world is the UNESCO stamp. I told them UNESCO Logo is as good as gold!

Their response was very positive.

To assure UNESCO of the comprehensive groundwork done by the professional engineering community, it was decided that FIEAP, ISTIC and UNESCO Regional Science Bureau for Asia and the Pacific in Jakarta would work together in our region. By a fortunate circumstance, the Deputy Director of UNESCO Jakarta, Dr. Shahbaz Khan is an eminent water resources engineer. He embraced the project with enthusiasm.

After a working visit to FIEAP Secretariat in IEM Kuala Lumpur, Professor Chuah and Dr. Shahbaz visite Myanmar together to meet with the newly established Myanmar Engineering Council. Dr Shahbaz then suggested that the trial project should be extended to three other countries in our region, namely PNG, Timur Leste, and Pakistan.
ISTIC and FIEAP agreed. It was further proposed to extend the trial project to Africa i.e. East Africa and West Africa as well as Peru in South America. The last is the first FIEAP national member from South America.

I tried to interest MERCOSUR countries through Argentina to participate in the UNESCO trial program. However, I was informed they have their own accreditation program:

“SISTEMA ARCU-SUR CRITERIOS DE CALIDAD PARA LA ACREDITACIÓN DE CARRERAS UNIVERSITARIAS TITULACIÓN INGENIERIA

MERCOSUR EDUCATIVO

DIMENSIONES, COMPONENTES, CRITERIOS E INDICADORES PARA LA ACREDITACION ARCU-SUR

TITULACIÓN: INGENIERIA

SISTEMA ARCU-SUR

OCTUBRE 2009”
Dr Shahbaz and I were in Yangon May 2014 meeting with Myanmar Engineering Council (MEC). MEC is expected to visit BEM in September 2014.

Dr Shahbaz and I will meet Pakistan Engineering Council in Islamabad 25 August 2014 with an one-day UNESCO/ISTIC/PEC Accreditation of Engineering Educational Qualifications Seminar with Stakeholders from Government, Academia and Industry.

In November 2014, we plan to visit Abuja Nigeria to discuss with COREN to spread the UNESCO Trial Program to other countries in West Africa.

Visits to Timur Leste, PNG and Peru are scheduled in 2015.
ISTIC returns home to UNESCO Paris once every 18 months to order to brief missions of member states about ISTIC’s agenda. I realise it is not enough to get UNESCO’s top management on board, I must also get the support of member states through their missions in UNESCO.

I realise that the great majority of the heads of delegations are from Ministries of Education. That is why I pitch my advocacy to them as accreditation of engineering educational qualifications instead of accreditation of engineering qualifications.

I am very pleased to have this opportunity to speak to key stakeholder in higher education in the Asia Pacific region this morning.

It is my hope that with the active participation and/or advocacy of UNESCO Jakarta, Bangkok and Paris, the momentum for international accreditation of engineering educational qualifications in South countries will be very much expedited, leading to UNESCO assuming the global leadership in the not too distant future.