Acredita CI Seminario Internacional 2023

Las mejores prácticas para el proceso de autoevaluación de una ingeniería en el marco de la acreditación reconocida por el Acuerdo de Washington

Best practices for the process of self-assessment of engineering within the framework of accreditation recognized by the Washington Agreement

Future focused engineering education, accreditation and mobility

Em Prof Elizabeth Taylor AO

Chair Washington Accord

Deputy Chair International Engineering Alliance

INTERNATIONAL ENGINEERING ALLIANCE

The presentation will address:

The purposes of the Accord and its importance as such.

Why it is important to ensure the quality of engineering training.

The role of the engineer, which is why it is important to consider the graduate attributes proposed by the IEA and the important mobility in their current professional performance worldwide, which is facilitated by this process.

International Engineering Alliance

Facilitating engineering mobility and quality – creating networks, sharing ideas

The International Engineering Alliance (IEA) is a global not-for-profit organisation, which comprises members from 41 jurisdictions within 29 countries, across seven international agreements.

These international agreements govern the multi-lateral recognition of engineering educational qualifications and professional competence and facilitate quality and engineering mobility.

	Professional	Technologist	Technician
Education - entry to practice	Washington Accord	Sydney Accord	Dublin Accord
Registration/ Chartered	International Professional Engineer Agreement (IPEA)	International Engineering Technologist Agreement (IETA)	Agreement for International Engineering Technicians (AIET)
	Asia-Pacific Economic Cooperation (APEC) Engineers Agreement		

International Engineering Alliance

Facilitating engineering mobility and quality – creating networks, sharing ideas

E Taylor: data as at Aug 2020

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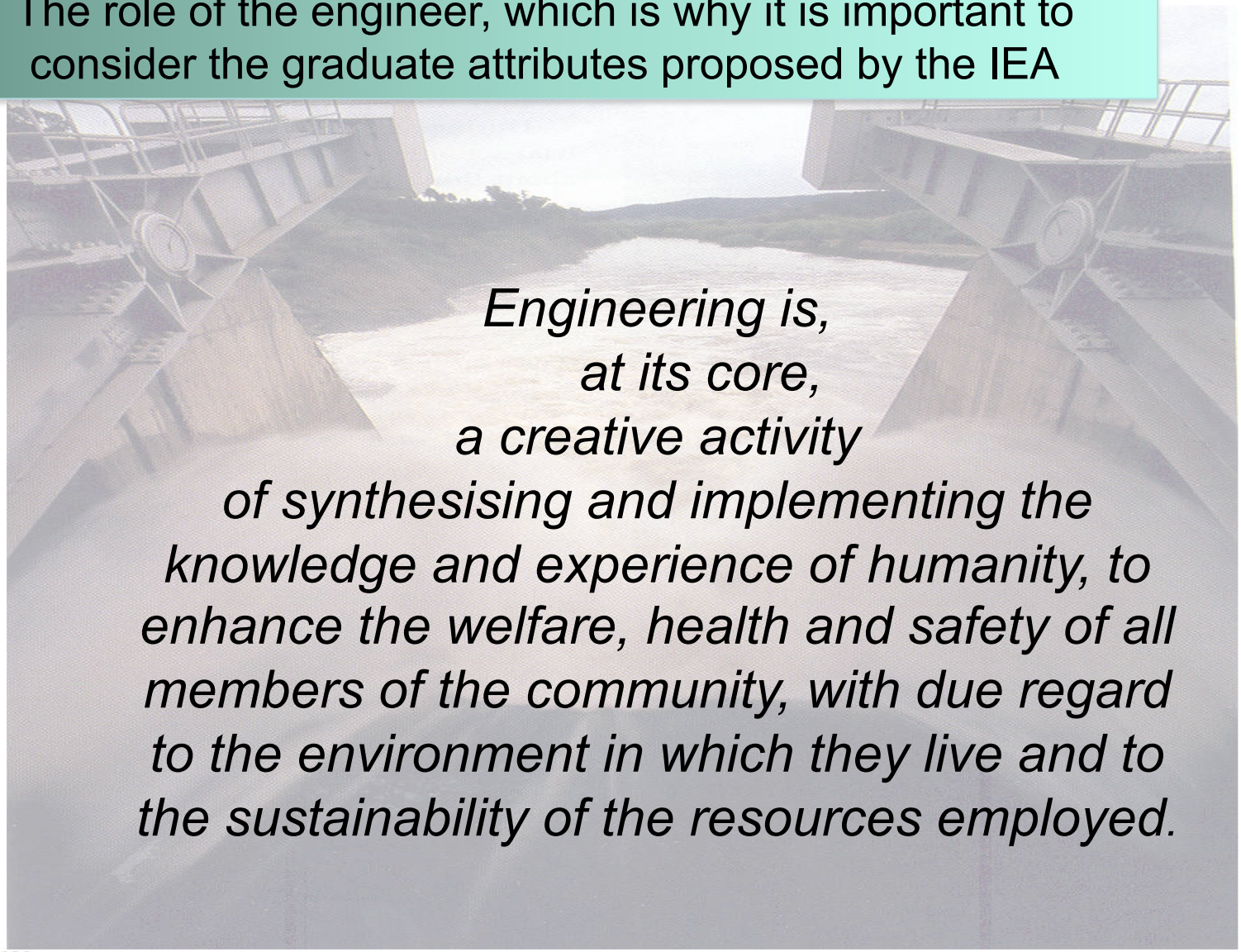
Engineering accreditation

The Accords and Agreements validate jurisdictional accreditation and registration/chartered systems, embedding the diversity arising from cultural and jurisdictional imperatives.

MUTUAL RECOGNITION OF SUBSTANTIAL EQUIVALENCE

The Graduate Attributes and Professional Competencies are the basis of determining equivalence

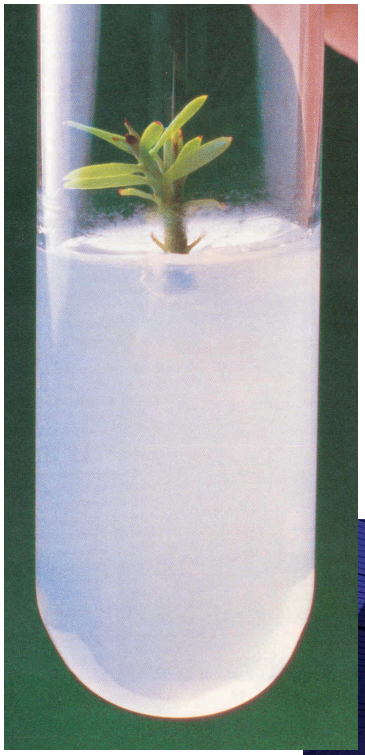
The role of the engineer, which is why it is important to consider the graduate attributes proposed by the IEA



Engineering is,
at its core,
a creative activity
of synthesising and implementing the knowledge and experience of humanity, to enhance the welfare, health and safety of all members of the community, with due regard to the environment in which they live and to the sustainability of the resources employed.

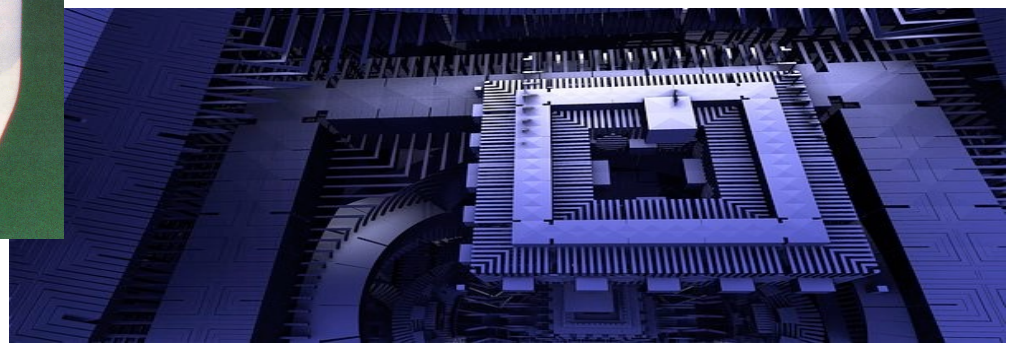
Science, engineering and society are never static

Engineering appears to be on the cusp of a new technologies revolution.



The physical, digital and biological are blurring.

A melting pot of technologies and cyber-physical systems offer great potential and challenge.



Within engineering circles discussion of the challenges raised by these new technologies generally revolve around accommodating emerging technologies:

- Applied anthropomorphism in AI evolution
- Cyber Security and Privacy
- Genetic engineering/modification/manipulation

BUT

We are ill equipped to consider the social environmental political consequences of our grand and noble narratives and consider whose interests we serve.

We engineered the present

Are engineers the tools of extinction?

Can humans grasp the idea that we are expendable?

The environmental-socio-geopolitical landscape is shifting rapidly.

This has, and will increasingly have, significant impact, with poverty, inequality, climate, and environmental degradation continuing to be borne heavily and inequitably across our communities.

The shift requires a recalibration of our engineering relationship with our communities.

It impacts how we operate into the future and therefore how we must educate and accredit for the future.

challenges encapsulated by the UNSDG

SUSTAINABLE DEVELOPMENT GOALS

The United Nations Sustainable Development Goals are the blueprint to achieve a better and more sustainable future for all.

They address the global challenges we face:

poverty,
inequality,
climate,
environmental degradation,
prosperity, and
peace and justice.

and engineering has a large role to play

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future focused benchmark standards

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GRADUATE ATTRIBUTES & PROFESSIONAL COMPETENCIES

PROUDLY SUPPORTED BY:

World Federation of Engineering Organizations
Fédération Mondiale des Organisations d'Ingénieurs

unesco

PREAMBLE

The International Engineering Alliance is pleased to announce that all Accords and Agreements have approved revisions to its Graduate Attributes and Professional Competencies (GAPC) international benchmark. The review, supported by UNESCO, was undertaken by a joint IEA-WFEO Working Group who engaged extensively with IEA signatories, WFEO members and WFEO partners representing academics, industry and women globally. They reflect requirements for new technologies and engineering disciplines, new pedagogies and values such as sustainable development, diversity and inclusion and ethics. They are well positioned to support the engineering role in building a more sustainable and equitable world.

Our thanks to UNESCO and WFEO for their constant support and endorsement and to the GAPC Working Group members, who commenced this work three years ago and who have worked tirelessly to bring this to fruition.

VERSION: 2021.1

The documents presented in this compendium are current as of 21 June 2021.

https://www.ieagreements.org/

Approved at IEA Annual meeting in June 2021 and presented at WFEO General Assembly in March 2022

The International Centre for Engineering Education (ICEE) at Tsinghua University, a member of the joint IEA - WFEO Working Group, undertook translations of the GAPC into the five other official UNESCO languages: French, Spanish, Arabic, Russian, Chinese.

[NOTE: the official language of the IEA is English. Translations assist the work of IEA members but are not the basis for IEA decisions]

All signatories/members have agreed that, by 2024, they will have a road map for implementation across their jurisdiction. In line with our aspirations for our profession and the communities we serve, we are working together to develop firm deadlines that minimise the time to implementation.

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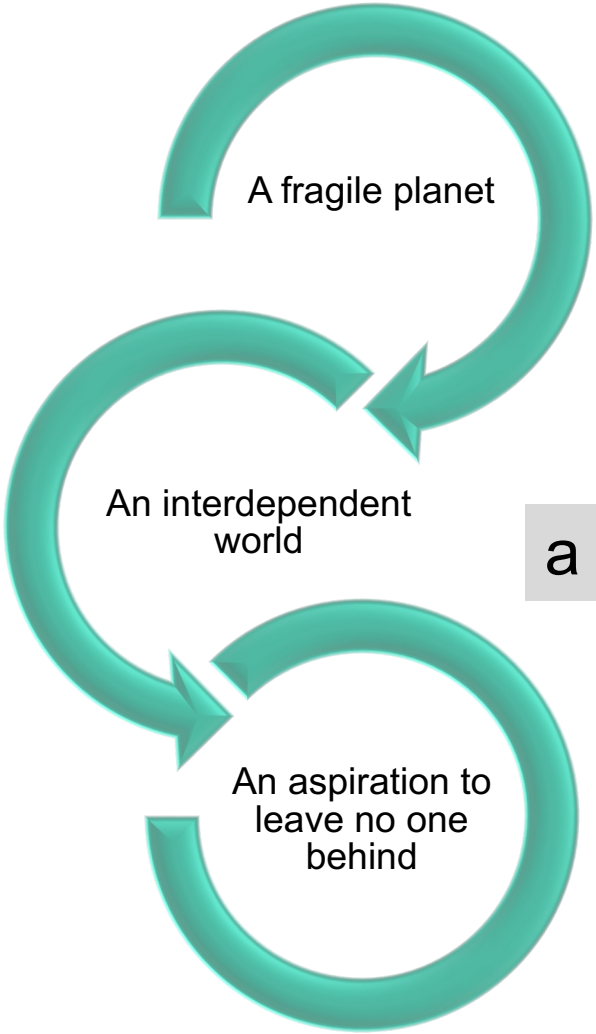
UNSDG and engineering



Achieving Sustainable Development will require very different engineering capability to that which has underpinned our past.

Building engineering capability <u>for sustainable development</u> will require:

a metamorphosis in engineering thinking

transformed engineering practice

innovative educational models

robust accreditation

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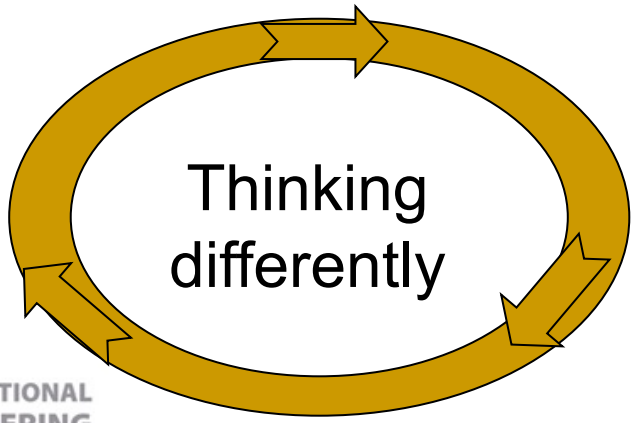
A metamorphosis in engineering thinking

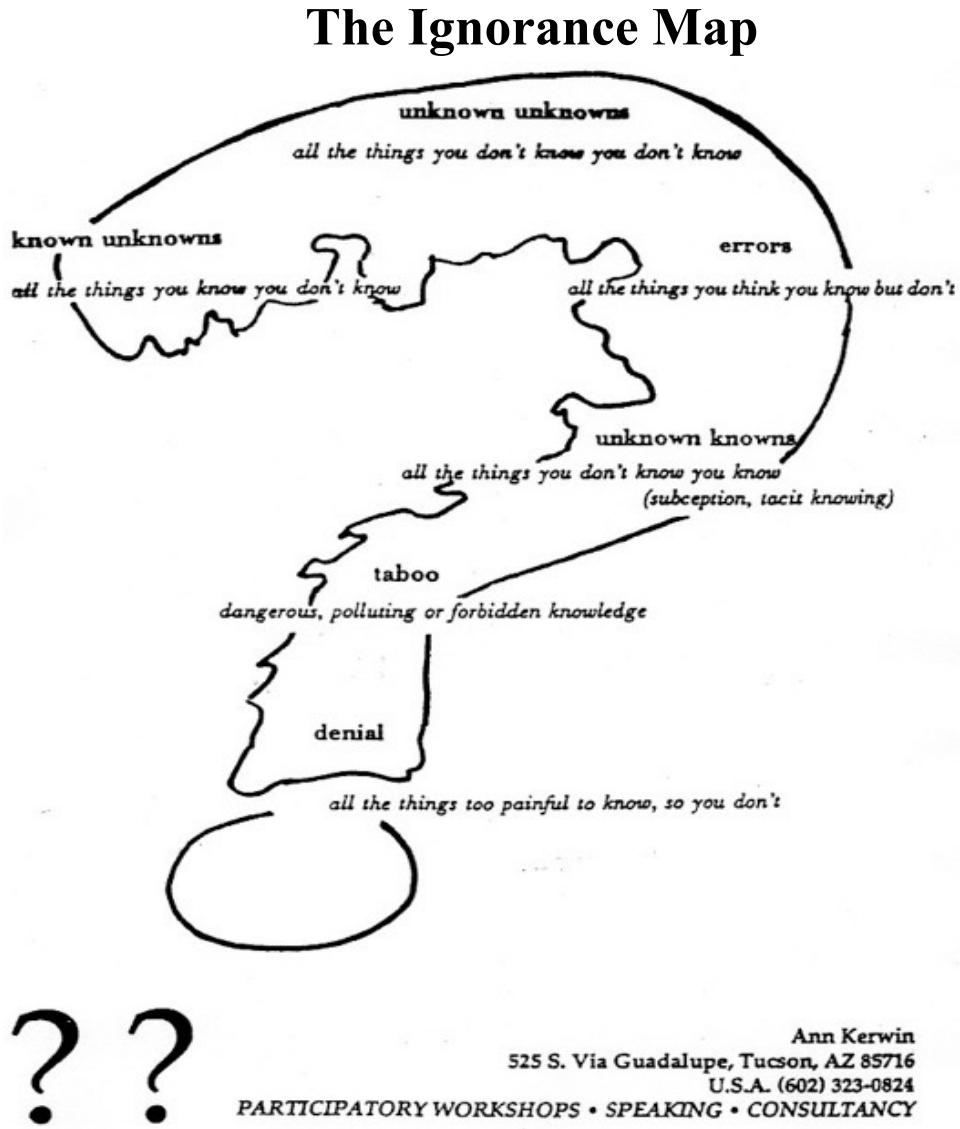
Engineering is about change and uncertainty

Taking individual responsibility within the larger system

Being open

Visualising other futures





http://www.ignorance.medicine.arizona.edu/ignorance.html

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a metamorphosis in engineering thinking

From a linear view of the future …..

towards Sustainable Development

Are engineers the tools of extinction?

Can humans grasp the idea that we are expendable?

innovative engineering education

A metamorphosis in engineering thinking transformed engineering practice innovative educational models

Shifts in education discourse

teaching to learning

certainty to chaos

contested ‘truth’

porous professionalism

fact plus initiative plus innovation

knowledge silos to interdisciplinary

theory and practice interdependence

‘sage on the stage’ to student-centred

connected universities – “gown and town”

http://commons.wikimedia.org/wiki/File:Meeting_of_doctors_at_the_university_of_Paris.jpg

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Future focused engineering education

Outcome-based education or **outcomes-based education** (**OBE**), also known as **standards-based education**, is an educational theory that bases each part of an educational system around goals (outcomes).

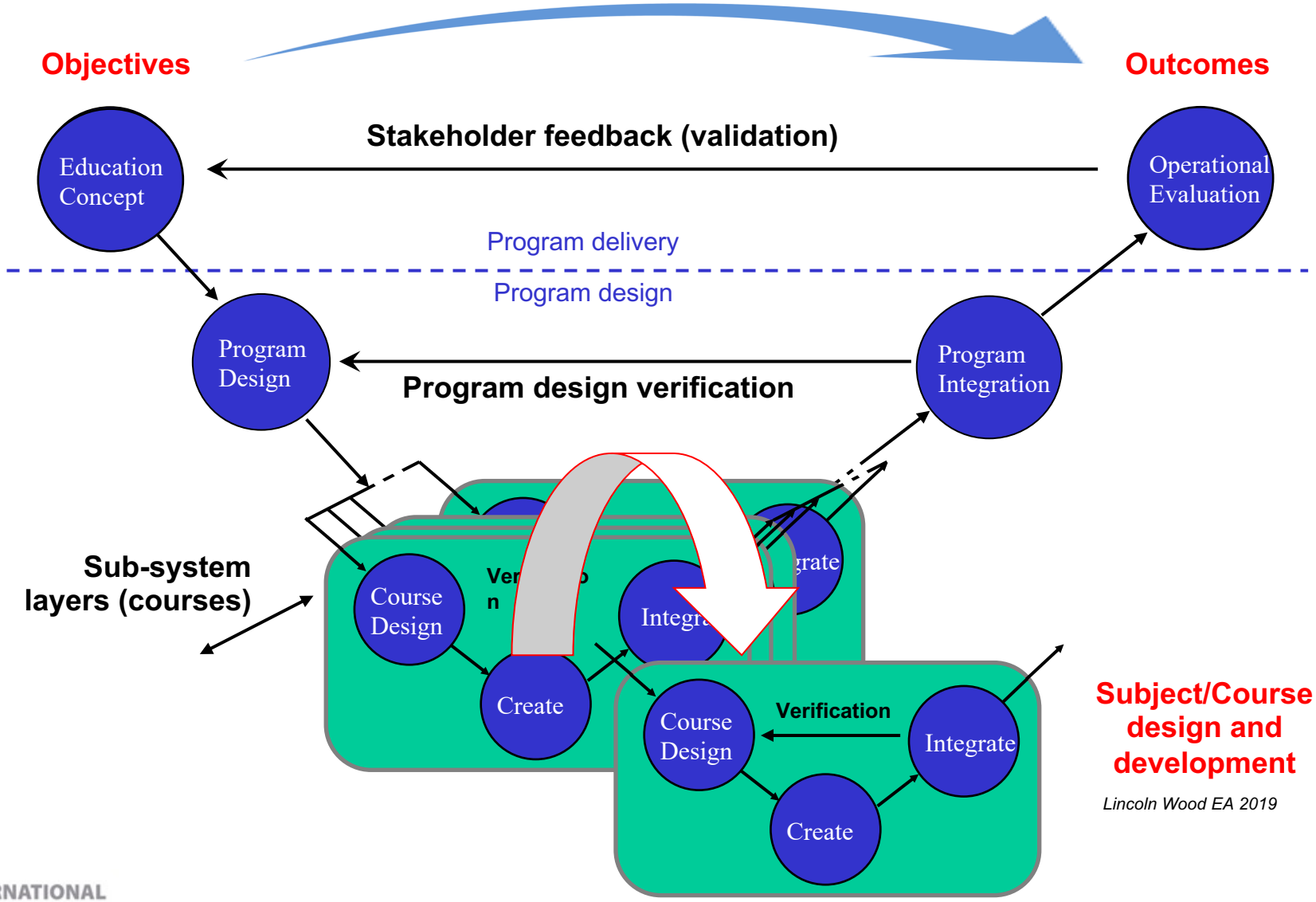
By the end of the educational experience, each student should have achieved the goal.

There is no single specified style of teaching or assessment in OBE; instead, classes, opportunities, and assessments should all help students achieve the specified outcomes.

The role of the faculty adapts into instructor, trainer, facilitator, and/or mentor based on the outcomes targeted.

https://en.wikipedia.org/wiki/Outcome-based_education

Systems model of an education program



Subject/Course design and development

Lincoln Wood EA 2019

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Quality Assurance: External validation
Accreditation visits to education providers by independent panels

Education objectives

Faculty/School objectives
Program objectives
Design approach

Provision of objective evidence supporting the self-assessment

Accreditation criteria

- Academic Program
- Operating Environment
- Quality System

Independent assessment of evidence, including meetings with staff and students

Education outcomes

Knowledge, skills, attitudes, and values that a graduate will need for entry to the profession of engineering

Meetings with graduates and industry representatives

Report of the Visit Panel

robust engineering accreditation

https://pixy.org/619753/

National education requirements
Community expectations
Industry input
Benchmarking

IEA Graduate Attributes and Professional Competencies

Career experiences

... inform

... inform

... inform

... inform

EA Initial Professional Competencies Stage 1

Australian Perspective

Expected learning outcomes (discipline-specific)

... feedback

Graduate capabilities

... inform

Specified learning outcomes

Engineering Education Program

mapping

Professional career

... inform

Expected learning outcomes (institutional)

EA Stage 1

EA Stage 2

Educational intentions

Education program

Educational outcomes

Professional practice

Lincoln Wood EA 2018

Accords

Agreements

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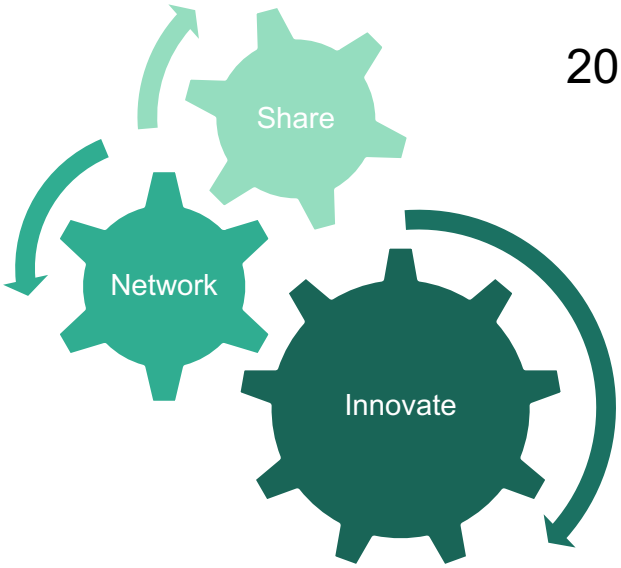
Harnessing diversity and collaboration

Sociological, anthropological and ecosystem studies suggest that diversity in our systems drives innovation and capacity to meet complexity, disruption and change.

Whenever a system is captured by one culture, by one world view, or one intellectual tradition and iterates to one metric (standard) of success, its capacity for intellectual flexibility and agility is significantly reduced.

Active engagement by all results in rich outcomes



2015 **IEA/ENAEE** publication: “Best practice in Accreditation”

Federation of Engineering Institutions in Asia and the Pacific (FEIAP) developing pathways to facilitate IEA Accord signatory status. Most recently this includes developing collaboration with the Federation of African Engineering Organisations.

In June 2018 the **World Federation of Engineering Organisations (WFEO)** and IEA established a project to address the needs of its members in the developing world, referenced to IEA standards.

=>Two working groups were established.

In 2019 **UNESCO, WFEO and IEA** signed a Declaration on “Global Engineering Education Standards and Capacity Building for Sustainable Development”. The Declaration detailed the commitment to work together on a number of actions to “*progress the supply of competent professional, technologist and technician engineers, in order to help achieve the Sustainable Development Goals*.”

International Engineering Alliance

Initiatives and efforts that support the mobility of professional engineers

Training Courses

developed by Prof LOCK Kai Sang and Prof KWON Ohyang

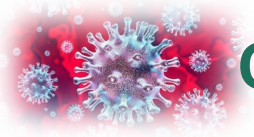
- IEA Accord Reviewer Training Workshop (May 21)
- IEA Mentoring Training Workshop (Apr 21)

Participation in the WFEO Academy

This training platform has been developed in collaboration with UNESCO, the International Engineering Alliance, the International Federation of Engineering Education Societies, the Global Engineering Deans Council and WFEO members to provide an education training platform in the spirit of Open Science Principles and as part of the WFEO Engineering 2030 Plan to enable more countries to have more engineers with the right skills for sustainable development.

https://wfeoacademy.com/

harnessing diversity and collaboration

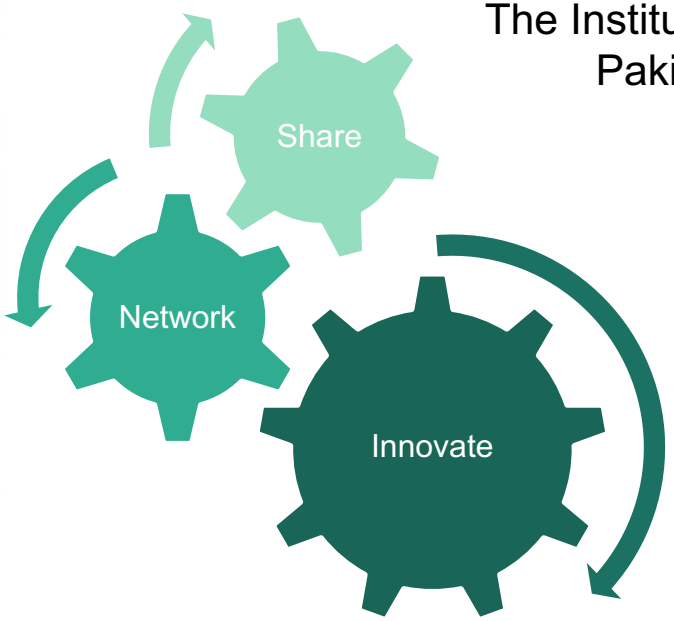


COVID disruptor – IEA Response

Welcome to the IEA **Accreditation in a Virtual World** Basecamp site set up 30 April 2020

Washington Accord Workshop – Sharing Best Practices and Policies for Online Teaching Learning and Assessment System and Virtual/Remote Accreditation Process

Organized by
The Institution of Engineers Singapore, IES and
Pakistan Engineering Council, PEC.
Saturday 13 June 2020



Symposium
Conferences
Discussion Groups
Seminars
Meetings
Collaboration

https://pixy.org/619753/

Working together to create a shared and better future

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The role of the engineer in society is why it is important to consider the Graduate Attributes proposed by the IEA and the important mobility in their current professional performance worldwide.

The International Engineering Alliance leverages our diversity to facilitate engineering mobility and quality and ensure that engineering education and accreditation meets the needs of the future.

17 PARTNERSHIPS FOR THE GOALS

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