06. WFEO and the International Engineering Alliance,

Prof. Yashin Brijmohan, Chair WFEO Capacity Building Committee, Chair Committee on International Education

Engineering Capacity Building Education in the IEA

Chair: Engineering Capacity Building Committee WFEO
Yashin Brijmohan
Executive Dean: Monash South Africa

Human Capacity Building

Infrastructure Capacity Building

Focus on Sustainable Development Goals

Quality Education

Partnership for the Goals

Good Jobs and Economic Growth

Strong Relationship: Economic Growth Infrastructure Development and the Number. of Science and Engineering Graduates

The Constraints / Issues

- No. of Graduates in Engineering
  - Several Countries have a low number of Graduates
  - Sub-Saharan Africa (1 Engineer to 6000 persons vs countries that have 1 Engineer to 200 – 800 persons)
  - Some Countries have Surplus / and deficiencies in certain area of Specialisation
- Inconsistent Quality Standards of Graduates Around the World
- Lack of Regulatory Intuitional Capacity to Regulate the Engineering Profession
- Lack of Acceptance for Mobility

INVESTIGATE and CREATE SOLOUTION

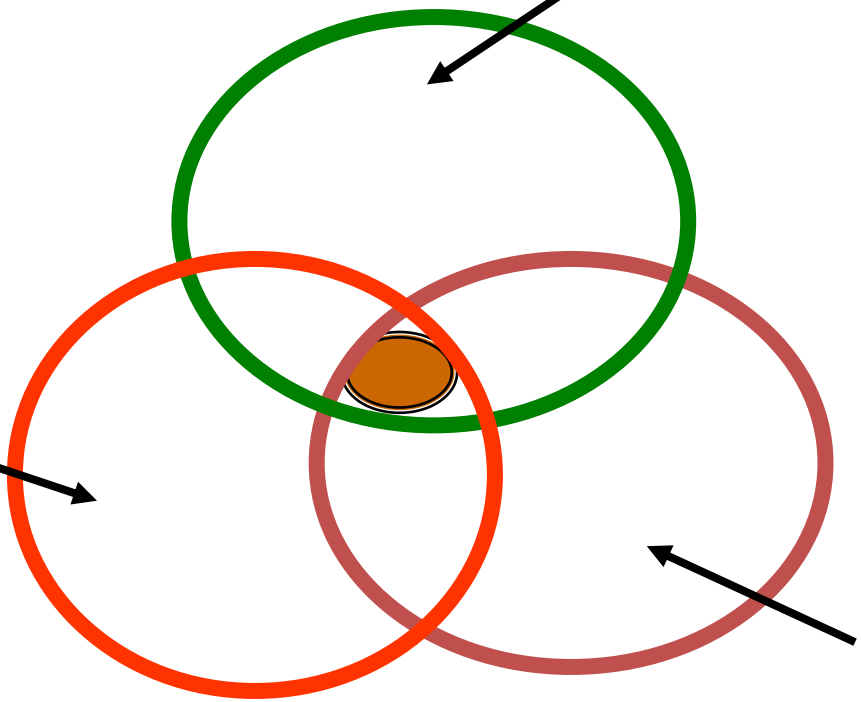
CAPACITY DEVELOPMENT THEMATIC PIPELINE

Primary Education	Higher Education Institutions	Young Professionals	Professional / Expert/ Management
Career Marketing	Learner Care Function	YP Care Function	Professional Care Function
Expo / Awards	Industry Tertiary Support	YP Development	Programme Development
Institutional Development	Academic Development	Awards	Networking for Professionals
Bursary Promotion	Awards		Awards
Identification of Potential Candidates			
Support to Primary Education			

Investigate and Create Solutions

- State of Educational Institutions
- Industry University Integration
- Regulatory Institutions for Learning
- Critical Mass and Throughput
- Gap between Higher and Primary Education
- Gap between Higher Education and Industry
- Surplus / Shortage in Specialisation areas

Capacity Building Programmes



Bodies to regulate Engineering Education Competency Agreements

Institutions for Education Delivery e.g Higher Education

WFEO Plays a Role to Bring Partners Together to address Common Goals

- ICEE
- UNESCO
- IFEES
- GEDC
- WFEO STCs
- IEA

INTERNATIONAL ENGINEERING ALLIANCE

“WORKING TOGETHER TO ADVANCE EDUCATIONAL QUALITY AND ENHANCE GLOBAL MOBILITY WITHIN THE ENGINEERING PROFESSION.”

“The International Engineering Alliance (IEA) is a global not-for-profit organisation, which comprises members from 36 jurisdictions within 27 countries, across seven international agreements. These international agreements govern the recognition of engineering educational qualifications and professional competence.

Through the Educational Accords and Competence Agreements members of the International Engineering Alliance establish and enforce internationally bench-marked standards for engineering education and expected competence for engineering practice.”

Educational Accords and Competence Agreements (Cont'd)

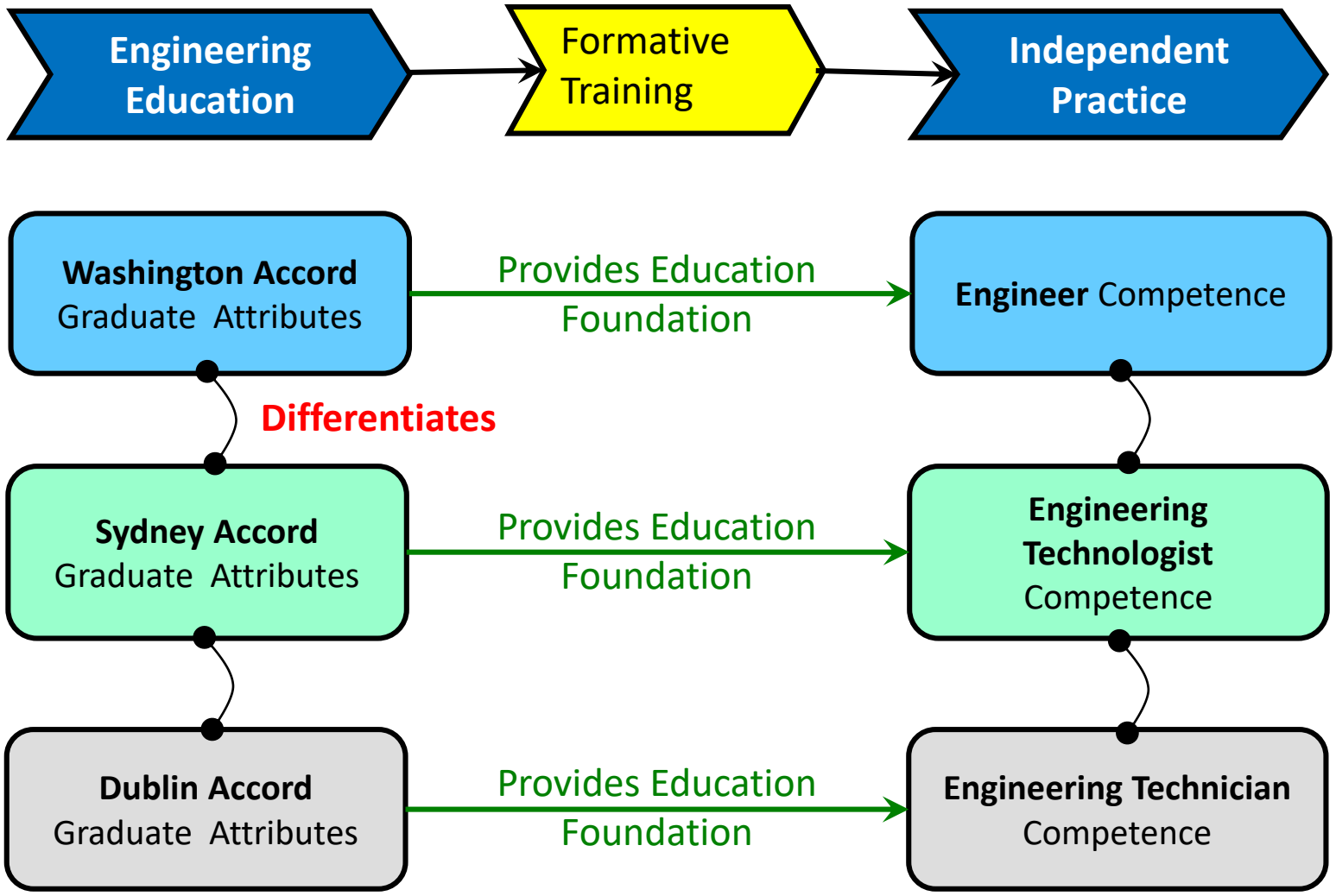
Three (3) Educational Accords

Washington Accord	Sydney Accord	Dublin Accord
• Engineers	• Engineering Technologists	• Engineering Technicians

Four (4) Competence Recognition/Mobility Agreements

International Professional Engineers Agreement	Asia Pacific Economic Cooperation	International Engineering Technologists Agreement	Agreement for International Technicians Agreement
• Professional Engineers	• Professional Engineers • Regional Agreement	• International Engineering Technologists	• International Engineering Technicians

Graduates Attributes and Professional Competencies



Available at: www.ieagreements.org

Intent for Countries:
To be signatories of the International Accords, Competency Recognition and Mobility Agreements

WFEO IEA Agreements
WFEO Operating Committee

- WFEO and IEA seek to collaborate and promote **accreditation and competence assessment** and to **build the capacity of national bodies** around the world to the point where they can **join the Accords** and the Agreements.
- WFEO and the IEA agree that the purpose of this agreement is to raise the competence of engineers around the world to ensure the **ethical practice** of engineering without corruption by:
- raising awareness of the importance of accreditation of engineering qualifications and competence assessment to **global standards**;
- building **political and financial commitment for the development of national engineering accreditation and competence assessment bodies**;
- building the capacity of national accreditation and competence assessment agencies and underlying facilities, so that those agencies can be **mentored** to achieve best global practice by the IEA/WFEO and their members;
- building the capacity of national accreditation and competence assessment bodies to the point where they can join the Accords and Agreements as **provisional and eventually full members**; and
- seeking partners and resources that will enable the achievement of these aims globally.

The Need for Systematic Resourcing for Capacity Building in Education

- WFEO, National, and International Partners
- Convergence of Interest
- Optimisation of Resources

WFEO Capacity Building Projects in Africa

- Compendium
- Africa Catalyst
- Mobilising the Engineering Initiative

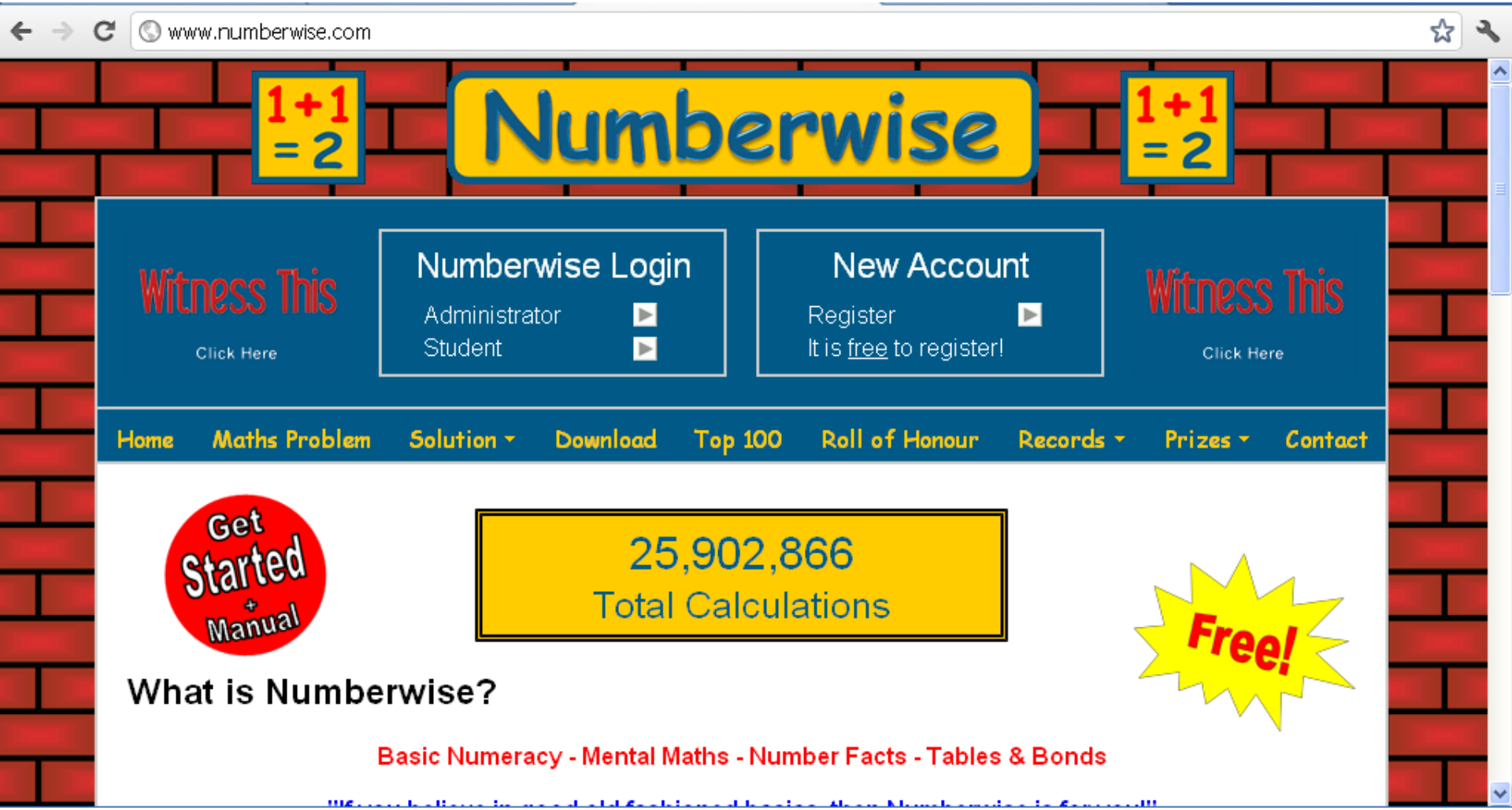
THE COMPENDIUM

- Repository for All Efforts
- Developed the Guidebook for International Use

the six pillars of capacity for sustainable engineering

Numeracy Problems

www.numberwise.com



The Africa Catalyst

- Building **engineering capacity** by improving engineering **education** at all levels and enabling degree courses to meet recognised international standards.
- Supporting the development of **professional engineering institutions** that can effectively support the profession and promote professionalism.
- Supporting the **Federation of African Engineering Organizations (FAEO)** - established in 2012 - in its leadership role across the continent.
- Strengthening the evidence base, for example through developing UNESCOs work mapping engineering capacity in Africa.

Concept to Mobilizing the UNESCO Engineering Initiative

WFEO co-ordinated a strategy through creating a platform called the UNESCO Africa Engineering Week to assist the Profession to gain support from Governments, Industry, and Society to Develop Engineering Capacity. Below are the outputs achieved

1) The profession has leveraged on this to create a platform where Engineers across the Continent come together debate and agree on Technical matters, which further strengthened Institutional Capacity

2) Mobilised the Profession to participate in influencing policy and restructuring themselves to develop the profession

3) Created the environment to address the Public and Society on Engineering Matters, and participate in attracting more learners to take up the profession of Engineering

Concept to Mobilizing the UNESCO Engineering Initiative

Further Outputs Achieved

FAEO managed to leverage the platform which gave birth to the Africa Engineering Conference

The participation of the Profession improved significantly and the profession for the first time has been invited to participate in Ministerial Congregations which also took place at the African Union level at the All Ministers meeting

Mobilised support by State Presidents and Ministerial support to Engineering which has been an output of this initiative (There have been many firsts in this regards where addresses where given at high political levels.

Created the environment to improve inclusivity within the Profession – Gender and Equity

Several Projects have been generated out of these platforms and the main events are managed by the International Member FAEO – for Sustainability

Relevance of Educational Outcomes and Impact of Technology on Educational Pedagogy and Delivery (STC on Education, Capacity Building)

- Skills Required of the New Age Engineering Professional
  - Beyond Technical Competence
  - Multidisciplinary Teams
  - Social and Environmental Context – Intercultural Competence
  - Entrepreneurship and Business Skills
  - Inter-Cultural Competence

- System of Longevity of Qualifications
  - Continuous Professional Development (Aligned)

(Half of what Engineers learn in their first year of studies outdated by end of the programme?)

Education Delivery: The Impact of Technology Pros

Enabler

Flexibility: Working Professionals / Increase Access

Cost efficiencies

Learning effectiveness

Education Delivery: The Impact of Technology Cons

Screen usage:

Grey matter Shrinkage,

Poor Cognitive Performance,

Attention deficiencies,

Metabolic syndrome: processing emotions, mortality risks

Environment

Responsible Education Systems : Legalities in Education

Responsible Education Systems

Responsible Educators

Ethical Leadership in Engineering Education

Thank You

I would like to Congratulate and take this moment to Celebrate the successes in this 50th Year Celebration

I would also like to recognise and celebrate all members, partners , and leaders that have led to the building the Engineering Profession, and would like to take this opportunity to congratulate WFEO on this 50th Year Celebration which has brought together National members and Leaders from all over the World to Work together to achieve the common goals of Humanity.

African Proverb

If you want to go **FAST**

Go **Alone**,

If you want to go **FAR**,

Go **Together**

Thank You