



UNESCO Member States Information Update

Advancing education in engineering

***Dr. Marlene Kanga AO FTSE FISC HonFIEAust HonFIChemE
WFEO President 2017-2019***



27 October 2022



WFEO – Office of Climate Change Education (OCE)
Climate Change Education Project
Mauritius - WFEO National Member
Small Island Developing State (SIDS)
Nov 2019 – Nov 2022



Climate Change Education Project – Mauritius 2019-2022

Partnerships for Climate Change Education

- UNESCO
- World Federation of Engineering Organisations (WFEO)
- Office of Climate Change Education (OCE)
- National Environment Agency Singapore (NEA)
- Mauritius Institute of Education (MIE)
- Institution of Engineers Mauritius (WFEO National Member)
- Mauritius National Commission to UNESCO
- Mauritius Ministry of Education, Tertiary Education, Science and Technology

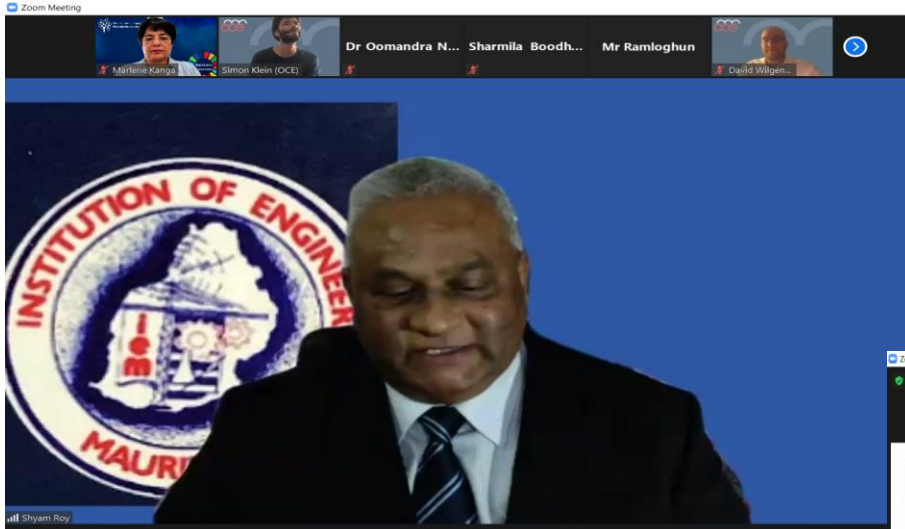
Project: Teacher training for world class climate change education for primary and secondary schools in Mauritius.

- first session – virtual - 29-30 June 2021.
- second session – 22-25 November 2022, in person in Mauritius

Funding: Donation of US\$10,000 WFEO Innovation Prize in Nov 2019 from National Environment Agency Singapore



Climate Change Education Project - Mauritius



Mr Shyam Roy, President of the Institution of Engineers Mauritius, welcomes delegates at the opening of the Climate Change Education Workshop, 29 June 2021

A screenshot from a Zoom meeting showing a presentation slide. The slide is titled 'Government of the Republic of Mauritius - Strong Commitment'. It features a diagram of the National Climate Action Plan. The diagram shows 'International Drivers' and 'National Drivers' (e.g. MID) leading to the 'National Climate Action Plan'. This plan is supported by the 'Ministry of Environment, Solid waste Management and Climate Change', the 'Ministry of Education, Tertiary Education, Science and Technology', and 'Other Government bodies and stakeholders'. A flowchart on the right shows 'Formal Education' leading to 'Non-formal Education' and 'Informal Education'. A video feed of Associate Prof. Dr Ravee Bholah is visible in the bottom right corner. The Zoom interface shows 57 participants and a 'Live' button.

Associate Prof. Dr Ravee Bholah, Associate Professor Head, Science Education Department Mauritius Institute of Education presents on the strong commitment of the Government of Mauritius to addressing climate Change, 30 June 2021



Climate Change Education Project - Mauritius

The screenshot shows a Zoom meeting window. The main content is a presentation slide titled "OUR RESOURCES - SUMMARY FOR TEACHERS". The slide includes a diagram of the water cycle with labels for "Warming atmosphere", "Warming ocean", "Melting glaciers", "Melting ice sheets", and "Sea level rise". Below the diagram is a line graph titled "Global mean surface air temperature Change relative to 1986-2005" showing historical data and two projected scenarios (RCP4.5 and RCP8.5) from 2000 to 2100. A text box on the right titled "CLASS ACTIVITY" describes an experiment to understand the effect of ocean acidification on corals. A video feed of Simon Klein is visible in the bottom right corner of the presentation area.

Dr Simon Klein presents information from the Office of Climate Change Education, UNESCO Category II Centre

Interactive session with teachers from Mauritius, Ms Rauma Imrit asks a question, 29 June 2021

The screenshot shows a Zoom meeting window. The main content is a video feed of Ms Rauma Imrit. Above the video feed is a participant list with icons for Rauma Imrit, Marlene Kanga, David Wigenton, Simon Klein, and Mathilde Tricore. The Zoom Meeting title bar at the top right says "Shakeel Mauritius". The Windows taskbar at the bottom shows the date and time as 3:45 PM on 30/06/2021.



Climate Change Education Project - Mauritius



22 - 25 November 2022



Climate Change Education Project – Mauritius - Outcomes

- Training for primary and secondary school teachers, approx. 80 in Mauritius and Rodrigues
- Training for Teacher Trainers
- Curriculum development for ongoing teaching of climate change – causes and effects
- Uses UNESCO SANDWATCH resources
- Ongoing long term benefits for the people of Mauritius





International Federation of Engineering Education Societies



WFEO – Engineering Education Projects



WFEO – UNESCO
Declaration, signed on March 7, 2018



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



United Nations
Educational, Scientific and
Cultural Organization



WFEO / FMOI

Paris Declaration

Advancing the United Nations
Sustainable Development Goals
through Engineering



The World Federation of Engineering Organizations (WFEO) is the main body for engineering globally, representing nearly 100 nations and some 30 million engineers.

The members of WFEO are the national and regional professional engineering institutions of the world. WFEO is a member of the United Nations Scientific and Technological Community (UN STC) Major Group and has an official Associate status with UNESCO.

UNESCO, as the United Nations agency for education, science and culture, supports engineering through its Natural Sciences Sector, and acknowledges engineering as a powerful means to achieve sustainable development, capacity-building in engineering education and gender equality in developing countries, as well as the safeguarding of world heritage.

CELEBRATING 50 YEARS OF INTERNATIONAL ENGINEERING LEADERSHIP

WFEO / FMOI

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Engineering for Sustainable Development

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1 **Increase the number and quality of engineering graduates...**

2. **Inform global standards for engineering education, support the development of a range of engineering education systems to comply with agreed standards...**

3. **Support Capacity Building through strong institutions for engineering education...**

Accordingly, we declare:

1. WFEO, a recognized member of the UN STC Major Group and UNESCO, through its Natural Sciences Sector, will work together and in cooperation with other UN organizations, including UNEP, UNFCCC and UNISDR towards achieving the SDGs through engineering.
2. WFEO and UNESCO are committed to the following principles for action through engineering to achieve the SDGs:
 - a. Increase the numbers and quality of engineering graduates that meet the needs of sustainable development with rapidly changing technologies, in collaboration with educators, government and industry;
 - b. Inform global standards for engineering education, support the development of a range of engineering education systems to comply with agreed standards and facilitate the mobility of engineers;
 - c. Support capacity-building through strong institutions for engineering education and the development of accreditation bodies for the recognition of professional credentials;
 - d. Establish policy frameworks and best practices, notably through WFEO Standing Technical Committees, as digital technologies, data sciences and artificial intelligence have ethical and social implications.

Signed in Paris, 7 March 2018

Marlene Kanga
Marlene Kanga
President
World Federation of Engineering Organizations

a.i. Flavia Schlegel
a.i. Flavia Schlegel
Assistant Director-General for Natural Sciences
UNESCO

stage in bringing together the WFEO members and partners to develop the *WFEO Engineering 2030 Plan*.

Note: "standards" used in 2018, Since 2019, using "benchmarks" to align with IEA definitions

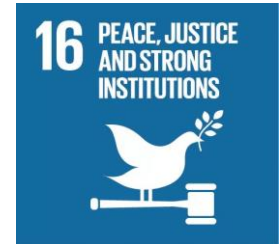


Since GA 2017 our vision has been that every one of the UN Sustainable Development Goals are advanced through engineering

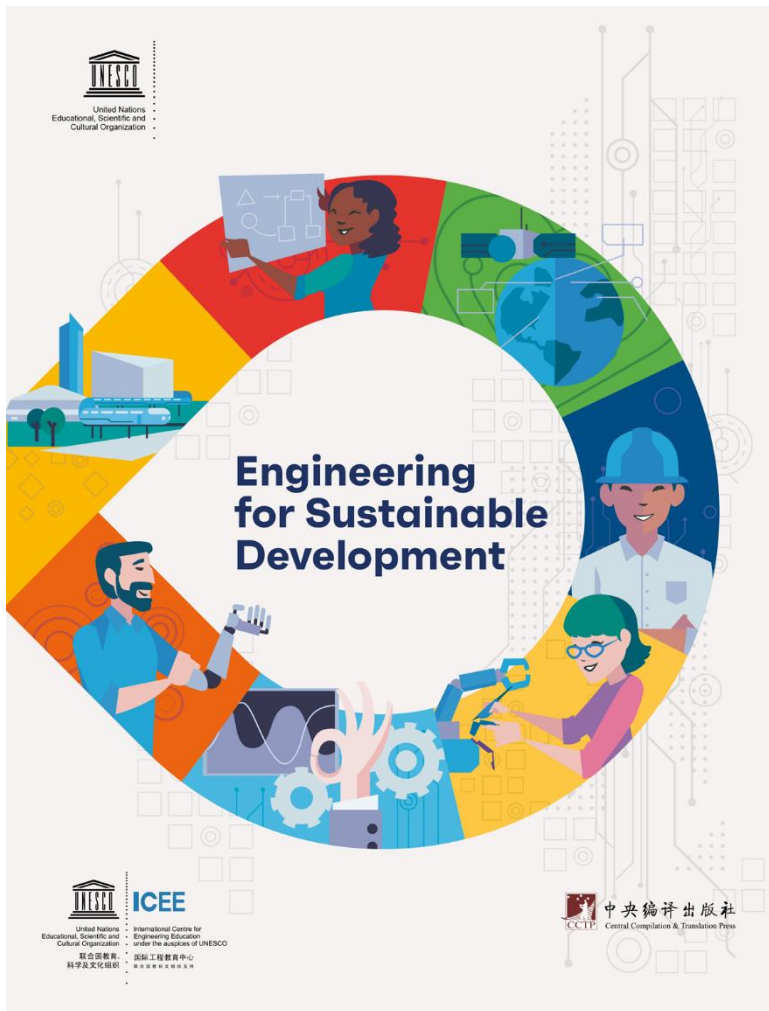


These projects:

1. Engineering education for the right skills - Goal 4
2. Develop institutional capacity – Goal 16 accreditation bodies and professional engineering institutions
3. Working in partnership – Goal 17
UNESCO, WFEO members, International Engineering Alliance and signatories, international engineering organizations



UNESCO Engineering Report – Engineering for Sustainable Development, 4 March 2021



The second UNESCO Engineering Report – “Engineering for the SDGs”, Chapter 1, author Dr Marlene Kanga recommends:

1. **“Government, engineering educators, industry and professional engineering institutions need to collaborate to increase the number and quality of engineers.**
2. **There is also a need to work in partnership to develop the necessary international engineering education benchmarks for sustainable development.**
3. **These need to be recognised across the world and form the basis of national engineering education systems for engineers with the right skills especially Asia, Africa and Latin America.”**

EN <http://on.unesco.org/Eng2021>, FR: <http://on.unesco.org/Ing2021>

ES <http://on.unesco.org/Ingen21>

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IEAM Approval 21 June 2021 Publication September 2021



**INTERNATIONAL
ENGINEERING
ALLIANCE**

**INTERNATIONAL ENGINEERING
ALLIANCE**

**GRADUATE ATTRIBUTES &
PROFESSIONAL COMPETENCIES**

PROUDLY SUPPORTED BY:



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



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GAPC Translations into six official UNESCO languages: EN FR SP RU CN AR completed Jan 2022. Awaiting approval by IEA and publication.



WFEO and IEA: Collaboration for Impact – Advancing Standards in Engineering Education



1. **Global action to support WFEO members around the world – Asia, Africa, Latin America**
2. **Development of national engineering education systems to comply with agreed benchmarks while meeting local requirements**
 1. Training for mentoring and support for development of education assessment systems and accreditation of programs
 2. Training for educators – complementary programs by partners e.g. IFEEES
3. **Building institutional capacity for accreditation bodies and professional engineering institutions – to deliver high standards of engineering education, training and professional development**
 1. Governance for accreditation bodies and PEIs
 2. Training and development for leadership, governance and systems



Reach of Current Mutual Recognition Systems and planned areas for project



Source: <https://www.engc.org.uk/international-activity/international-relationships-map/>



Collaboration for support across the world

Deep appreciation for support for this important project to:

Assistant Director General Dr Shamila Nair-Bedouelle for her ongoing support

Em. Prof. Elizabeth Taylor, Chair of the Washington Accord, and the IEA Signatories that have generously agreed to provide mentoring support:

- **Pakistan** Engineering Council – Dr Nasir Khan, Dr Ashfaq Ahmed Sheikh, Dr Fazal Khalid and others (IEA Signatory, WFEO Affiliate)
- National Board of Accreditation, **India** –Dr K.K. Aggarwal, Dr Sanjay Agrawal and others (IEA Signatory)
- Board of Engineers **Malaysia** – Dr Abdul Aziz, Ir Hasril Hasini (IEA Signatory)
- Engineering Council of **South Africa** – T C Madikane, Prof Brandon Collier-Reed (IEA Signatory, WFEO National Member)
- **China** Association of Science and Technology (CAST) – Prof Wang Xue (IEA Signatory, WFEO National Member)
- Association for Evaluation and Accreditation of Engineering Programs, (MÜDEK), **Turkey**, Mr Yavuz Ercil (IEA Signatory)

The **Myanmar** Engineering Council, Prof Dr Zaw Min Aung, Secretary Ms Su and Mr Yin Htwe Thet and others provided all the meeting and secretariat facilities despite a difficult working environment.

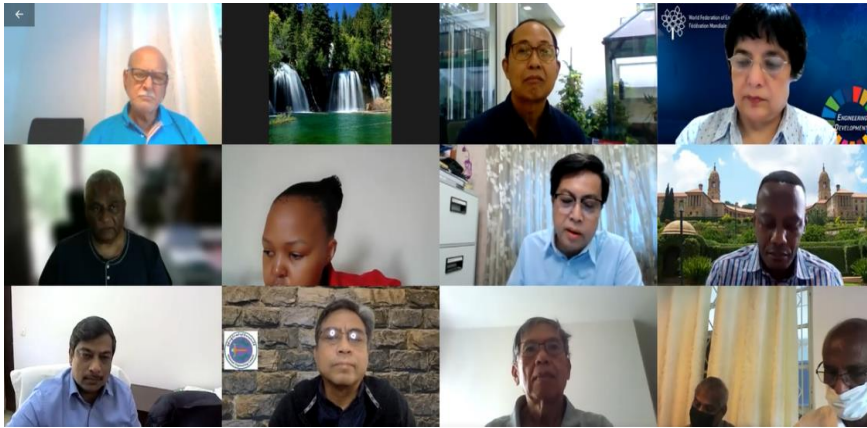
I personally attended all meetings and will continue to lead and support the project

Engineering for Sustainable Development

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Collaborative Mentoring Meetings - Advancing Engineering Education



The mentoring session of Institution of Engineers Mauritius (IEM) with National Board of Accreditation (NBA, India) & Engineering Council of South Africa (ECSA)



Meeting with Engineers Board of Kenya (EBK) with Pakistan Engineering Council (PEC) & Board of Engineers Malaysia (BEM)



Meeting with the Ghana Tertiary Education Commission (GTEC) with China Association for Science and Technology (CAST) & Association for Evaluation and Accreditation of Engineering Programs (MÜDEK)



WFEO: Capacity Building in Engineering Education – Site Visit to Mauritius by Mentors and WFEO 27 June-1 July 2022



Opening Session: L to R: Chair Quality Assurance Authority, Chair Council for Registration of Professional Engineers, President Institution of Engineers Mauritius, WFEO President 2017-2019 Dr Marlene Kanga, Vice Prime Minister and Minister for Science and Technology Mauritius, Dr S Agrawal, Mentor NBA India, Dr Andrew Chan, Chair Engineering Accreditation Board Mauritius, Chair Mauritius Institute of Education, Chair Tertiary Education Commission Mauritius, 27 June 2022



Assessor team (Chem Engg.) and observers at University of Mauritius 28 June 2022



WFEO Academy website – on line training in engineering education at no cost



WFEO Training website - Courses



- **Activates UNESCO Open Science Principles**
- Enable knowledge transfer from experts in engineering education from members, affiliates and partners of WFEO via webinars
- This is a sustainable approach, using the knowledge and good will of hundreds of experts that have given their time willingly for the webinars and will build knowledge and skills in the spirit of the UNESCO Open Science Recommendations.
- The training is available on demand, at any time and any place around the world,.
- The website is available in more than 100 languages
- **The content is available at no cost to individuals that are members and affiliates of the Federation.**
- The training benefits are expected to have long term impact on the economies that are supported and thus support the mandate of both WFEO and UNESCO in building capacity for engineering education.
- Visit: www.wfeoacademy.com



WFEO Academy website : UNESCO Support



WFEO-UNESCO-Shamila
from Adrian

unesco

unesco

04:09

vimeo

unesco

UNESCO OPEN SCIENCE

WFEO is proud to support UNESCO Recommendations on Open Science with free access to capacity building in engineering education and professional development for individuals and institutions to ensure the world has more engineers with the right skills for sustainable development.

UNESCO is a key supporter of this project and will engage its member states in promoting it. This project activities the UNESCO Open Science Recommendations and uses innovation and technology to transfer much needed skills to developing countries in Asia, Africa and Latin America.



WFEO Academy website – Maximising access with translation

تسجيل خروج | تيشي

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المقدمة | صلاحياتنا | الخدمات | التصنيفات | معلومات عنا

أبدا الدورة

إعادة تحديد المعايير لخريجي الهندسة // IFEES
بالمهارات المناسبة للتنمية المستدامة

1 ساعة و 7 دقيقة الفيديو

प्रविष्टि | लॉग आउट

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हमारे बारे में | बैचिने | पाठ्यक्रम | संर्क करें | पसंदीदा

शुरू करें

IFEES // सतत विकास के लिए सही कौशल के साथ इंजीनियरिंग स्नातकों के लिए बेंचमार्क फिर से सेट करना

वीडियो 1 मिनट

Testy | Toka nje

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KUHUSU SISI | KATEGORIA | KOZI | WASILIANA NASI | VIPENDWA | KISWAHILI

Ongeza kwenye Orodha ya Matamiano

IFEES // Kuweka upya Vigezo kwa Wahitimu wa Uhandisi wenye Ustadi Sahihi kwa Maendeleo Endelevu

Mihadhara 1

မင်္ဂလာပြုခြင်း | ဝတ်လုံခြုံရေး

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ကြိုဆိုချက်အတွက် | အပူချိန်အားဖြင့် | သင်တန်းများ | ကြိုဆိုချက်အတွက်အကျဉ်းချုပ် | အချိန်ပိုင်းများ | မြန်မာ (ဗမာ)

သင်တန်းစတင်ပါ။

IFEES // ရေရှည်တည်တံ့သောဖွံ့ဖြိုးတိုးတက်မှုအတွက် မှန်ကန်သောကျွမ်းကျင်မှုများဖြင့် အင်ဂျင်နီယာဘွဲ့ရများအတွက် စံသတ်မှတ်ချက်များကို ပြန်လည်သတ်မှတ်ခြင်း

ဗဟိုပြုချက်များ





***Engineering* for Sustainable Development**

- **Participation**
- **Influence**
- **Representation**



**The world's engineers
united in rising to
the world's challenges.
For a better, sustainable world**



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