



Engineering Skills Development:-

Imperative to Africa's Sustainable Future

Engr. Mustafa B. Shehu, *FNSE, FAEng., FSESN*

Executive Vice President, World Federation of
Engineering Organizations (WFEO)



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Presentation Outline

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- *Hard and Soft Skills*
- *Dynamics of the Engineering Profession*
- *Challenges Created*
- *The Moroccan Example*
- *What to do?*
- *Conclusion*





Meet the Presenter

Engr. Mustafa B. Shehu, *FNSE, FAEng., FSESN.*

- Executive Vice President, World Federation of Engineering Organizations
- Past President, Federation of African Engineering Organisations
- Past President, Nigerian Society of Engineers
- Chairman/CEO- MBS Engineering Limited, Nigeria
- Engineer with 35+ years of experience in practice, management and leadership





About WFEO

- The international organization for the engineering profession
- Founded in 1968
- Under the auspices of UNESCO
- 90+ national engineering institutions
- Representing more than 30 million engineers
- Recognised NGO at UNESCO, with association status
- Member of UN Scientific and Technological Community Major Group
- 10 Standing Technical Committees and 3 Working Groups
- Executive Council
- Executive Board
- Supported by a small secretariat based in Paris
- On March 7, 2018 WFEO co-organized with UNESCO a half-day symposium at UNESCO headquarters in Paris.
- Top representatives from UNESCO, WFEO national and international members, and partnering NGOs presented their views on advancing the Sustainable Development Goals through engineering.
- The Paris Declaration was signed by WFEO President and UNESCO Assistant Director General for Science, the first ever joint commitment by UNESCO and any organization to promote engineering as a means of building sustainable development.





About WFEO- *Contd*

- WFEO received some 80 letters of support from international and national institutions, academies and national commissions to UNESCO, representing 23 million engineers around the world towards the realisation of World Engineering Day for Sustainable Development
- The 40th General Conference of UNESCO has adopted the resolution to proclaim 4th March of every year a World Engineering Day for Sustainable Development in November 2019.
- 4th March was chosen to commemorate the date that WFEO was established on same day in 1968
- First world Engineering day was celebrated on 4th March 2020
- The day provides an opportunity to celebrate the important contributions of engineers and engineering to sustainable development and modern life.
- Organizations and offices of the United Nations system, and most importantly, governments, civil society, the public and private sectors, schools, universities, and more generally, citizens, are expected to make the international day a springboard for awareness-raising actions.





WFEO Partners





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Definition of Engineering Skills

- The knowledge and talents required to enable an engineer or technologist to discharge his/her duties successfully, effectively and efficiently
- the taking of initiative and responsibility of the individual for business situations that he confronts.
- Participation to solving problems in group
- It includes Hard and soft Skills





Hard and Soft Skills in Engineering
As there is no limit to the definition of hard and soft skills the following are just indicative examples but not limitative

SOFT SKILLS

- **Unquantifiable attributes that cannot be proven but must be demonstrated through work style and approach**
- **Successful demonstration of soft skills is left to subjective opinion**
 - Adaptability
 - Problem thinking
 - Organization
 - Teamwork
 - Creativity
 - Critical Thinking
 - Willingness to learn
 - Empathy
 - Integrity
 - Dependability
 - Effective communication
 - Open-mindedness
 - Leadership

HARD SKILLS

- **Specific and quantifiable knowledge or abilities; usually absolutely necessary for success**
- **Can be demonstrated through tangible evidence such as a degree, certificate or examples of work**
 - SEO/ SEM Marketing
 - Database Management
 - Data mining
 - Mobile development
 - UI/UX Design
 - Programming
 - Languages (Python, etc)
 - Cloud Computing
 - Data Science
 - Business Analytics
 - Network security
 - Computer Skills
 - Foreign Languages
 - Math Skills
 - Programming Skills



CAREERCLIFF.COM

HARD SKILLS VS SOFT SKILLS

SOURCE: SBA.GOV





Dynamics of the engineering profession

- Due to advancing technologies in ICT, robotics, big data, Artificial Intelligence and the advent of quantum computing, the amount of new technical information is doubling every two years, meaning that for students starting a 4-year engineering degree program, half of what they learn in the 1st year will be outdated in the third year of study.
- We are currently preparing students for jobs that don't yet exist, using technologies that haven't been invented in order to solve problems we don't even know they exist.
- The Top 10 in-demand jobs today did not exist 15 years ago
- Increasingly there are more and more renowned and prestigious companies that no longer require a degree for work.





Challenges Created

- Many skilled jobs are being lost to automation, AI and robotics now and more will be lost in the nearest future
- Even without the effect of automation and robotics, there is a declining trend in skilled manpower in Nigeria and many African countries.
- The trend is contributing to high unemployment rate of Africa's youth population
- On the other side, there is high rate of proliferation of new Universities as against Polytechnics, Technical Colleges and Skills Acquisition Centres, with attendant mad rush for degrees and higher qualifications, which do not necessarily translate to ability get a job or to solve practical problems facing our communities or countries.
- Inadequate skilled manpower to meet the emerging dynamics in a country hampers economic growth and prosperity





The Moroccan Example

- One of the best Skills Acquisition Programmes in Africa
- Over 2,000 Institutions/ Vocational Training Centres across the Kingdom run by both public and private sectors
- over 600,000 young Moroccans from the age of 15 years upwards are being trained annually in skills of different trades covering building, ICT, automobile, electronics, hospitality, aviation, agricultural and other industries
- Products of the Skills Centres are not only serving in Morocco, but many end up to serve in Middle East and Europe, where they are received with dignity and honour





Recommendations

- There is urgent need to revisit our educational and industrialisation policies to ensure that it reflects and meets the emerging trend in engineering and technological developments.
- It is in our best interest as engineers and leaders to see to the development of engineering skills in Africa to ensure delivery of quality infrastructure using local human resources.
- More needs to be done to ensure that the jobs lost due to advances in the ICT, Robotics Big data are substituted by up-skilling of our technical and engineering personnel to meet the changing trends
- Public, private sectors as well as professional engineering institutions need to strengthen their partnership in developing relevant Skills Acquisition Centres to meet the evolving needs of our societies, thus creating the much-needed employment opportunities for our youths for sustainable development.





Conclusion

With the advances in technology globally, there is an urgent need to give a second look into our educational system in order to meet the skills gap needed by the emerging trends. As engineers we have to be concerned about the quality of the skilled manpower that is involved in the delivery of the infrastructure we design and construct.

Constructive engagement with Government and private sector is the therefore imperative to meet the skills need for sustainable future of our continent using indigenous human resources





Thank you



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