

Engineering Africa's Future – The female factor

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Introduction

- Engineering is essential for Africa's development
- Large numbers of engineering practitioners will be needed in diverse fields to achieve the AU's vision for Africa Agenda 2063 and the UN's Sustainable Development Goals (SDG's)
- Diversity in the Engineering Workforce will be required but the participation of females in the engineering workforce in Africa is very low in many countries
- There are many barriers to female entry into the engineering workforce and challenges to their retention and urgent action is required to remove these barriers and retain females

Engineering and Africa's Development

- African countries have spelt out their vision for Africa's future in the AU's Agenda 2063 - *The Africa we want* and there is little doubt that engineering will be required to achieve their vision
- African countries have also signed up to the UN's Sustainable Development Goals (SDG's) which can also not be achieved without engineering input

AU's Agenda 2063 goals

1

A high standard of living, quality of life and well-being for all citizens

4

Transformed economies

5

Modern agriculture for increased productivity & production

6

Blue/ocean economy for accelerated economic growth

7

Environmentally sustainable and climate resilient economies and communities

10

World class infrastructure criss - crosses Africa

Sustainable Development Goals (SDG's)



2
6
9
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13
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Engineering Skills Required

Agriculture, Forestry, Fishing	Manufacturing
Construction	Mining and Quarrying
E-government	Real Estate
Electricity, Gas and Water	Transport
Finance and Insurance	Communication

Typical Engineering Disciplines

Aeronautical	Marine
Agricultural	Mechanical
Chemical	Metallurgy
Civil	Materials
Electrical	Mining
Electronics,	Oil and gas
Industrial	Systems & Telecommunications

Why Must Females Participate

- The need for gender equality is recognised in the AU's Agenda 2063 and the SDG's
- The numbers of engineering practitioners required to deliver on the vision for the *Africa we Want* offers an excellent opportunity to engage large numbers in meaningful occupations. This must include females
- In engineering a future for Africa, solutions must be delivered for a population that is roughly half female. It is therefore imperative that those crafting and delivering these solutions include a similar proportion of females
- Africa cannot afford to miss out on the potential of half of its population

Barriers to Female Entry

- Biases and Stereotyping
- Cultural and traditional beliefs
- Institutional Barriers e.g. inadequate science placements in second cycle institutions
- Inadequate teaching of science and mathematics
- Lack of female role models

Barriers to Female Retention

- Unfriendly workplaces
- Difficulties from work family life balance
- Sexual Harassment
- Unfair treatment in job allocation
- Lack of female role models especially in management
- Insufficient capacity building opportunities

Removing the Barriers to Entry

- Sensitisation of Teachers and Parents and improved career guidance
- Improving science and maths teaching in schools
- Exposure to female role models
- Removing Institutional barriers such as providing more opportunities for science and maths study

Ensuring Retention of Females

Promote the adoption of:

- Gender sensitive policies in educational institutions policies and workplaces
- Affirmative action to encourage the employment of females in engineering organisations
- Workplace policies that recognise the need for females to balance work and family
- Specific action to ensure that females get the training they need to build their confidence

Specific Proposals for Engineering Education Accreditation

- Accreditation teams may require Institutions to develop a specific gender policy document
- Gender policy may include favourable policies for the enrolment of females into engineering.
- Gender policy should ensure that females that undertake engineering courses have a conducive atmosphere in which to learn
- Faculty and Students must receive orientation so that they do not engage in behaviours that females will find offensive
- Educational Institutions must ensure that support systems are in place for mentoring and monitoring females during their course.(E.g. Women in Engineering groups)

Specific Proposals for Capacity Building of Professionals

- Engineering regulation bodies must register engineering firms and make it a requirement for them to commit to the development of engineering practitioners
- Engineering firms must be encouraged to sign agreements to cover the training of engineering practitioners to ensure all the trainees whether male or female receive the necessary training
- Quota requirements appropriate to the country and company can then be recommended for number of female engineering practitioners employed and trained can then be recommended
- The availability of appropriate workplace gender policies can be a requirement for registration

Conclusion - 1

- The vision for Africa's future as defined by the AU in its Agenda 2063 and the UN's SDG's cannot be achieved without the application of engineering skills
- A significant number of engineering practitioners will be needed to deliver on the vision and this presents an opportunity for Africa to engage its youth in meaningful occupations and females must not be left behind
- Females in Africa face many obstacles which prevent their entry and retention in the engineering workforce. These may be social or Institutional
- Intentional actions must be taken to address the problem

Conclusion - 2

- Engineering Accreditation Bodies may be used to ensure gender sensitive policies in education
- Engineering Regulation bodies may be used to help address some of the work place challenges

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