

# **AFRICAN ENGINEERING EDUCATION ASSOCIATION**

## **EVOLUSION AND THE JOURNEY SO FAR**

### **1.0 INTRODUCTION**

In 1998, we attended the Global Congress on Engineering Education which was held at the University of Mining and Metallurgy, Cracow, Poland between 6th and 11th September, 1998. The programme was organised by the UNESCO International Centre for Engineering Education (UICEE), Australia under the leadership of Prof. Zenon J. Pudlowski. At the conference, there were 140 participants with only 2 black one from Nigeria and the other from South Africa. I also met a colleague, Prof. Duncan Fraser from South Africa who was very knowledgeable in engineering education. The thrust of discussion at the congress centered on globalisation of engineering curriculum, international collaboration and problems that were prevalent in developing countries, unfortunately participants from developing African nations were inadequately represented. This concern led to my meeting with the Secretary-General of the Nigerian National Commission for UNESCO (NATCOMUNESCO) on my arrival in Nigeria. The Secretary-General shared my view that African nations must come together in a single forum and identify how to work together and how each nation would be relevant globally in engineering education.

In 1999, I was appointed as one of the Consultants to work on UNESCO Draft Programme and Budget for 2000/2001 (30C/5) which was subsequently submitted to UNESCO Paris.

In the document, we identified some projects for sponsorship by UNESCO out of which approval was given for the 'Sub-Regional Workshop on New Engineering Curriculum'. When the approval of the proposal was conveyed to us in January, 2002, we decided to expand the scope to include other African countries to enable us come together as a family and examine our common problems in engineering education with a view to finding appropriate solutions to them.

At the inception, the maiden conference was titled '1st African Regional Conference on Engineering Education (ARCEE) 2002' to mark the beginning of series of such programmes to follow in the African region. However, along the line, NATCOM-UNESCO felt the title of the programme should reflect the name for which the grant was given rather than having it as a sub-theme as existed in the conference 'call for papers'. In view of this, sub-regional workshop on new engineering curriculum was added to the conference title. Consequently, the two programmes were co-located.

The programme, ARCEE 2002, was partly sponsored by UNESCO while Faculty of Engineering with the assistance of University of Lagos, Federal Ministry of Education, Federal Ministry of

Science and Technology and Nigerian Television Authority (NTA) provided the counterpart funding in its determination to provide leadership in engineering education in Nigeria and beyond.

In all, Forty-Five (45) papers were presented by participants from Nigeria, U.S.A, South Africa, Ghana, Kenya, Sierra Leone, Liberia, Senegal and Togo. At the end of the programme, a meeting was held between the foreign and local participants. It was agreed that the Regional Conference on Engineering Education should be held biennially and that efforts should be made to link up with the New Partnership for African Development (NEPAD) to enable full participation of member Nations in 2004. University of Lagos was enjoined to host the 2<sup>nd</sup> edition of the conference in 2004. The conference was partly funded by the Directorate of Technical Cooperation in Africa (DTCA), African Network for Scientific and Technological Institutions (ANSTI) and United Nations for Educational Scientific and Cultural Organisation (UNESCO). Apart from sponsoring the conference, Dr. Sule Bassi, Director-General of DTCA, used his good offices to advertise the conference to individuals and organisations. Among was Prof. Folarin Osotimehin, the Senior Science partner, UNESCO Paris who used his good offices to sponsor participants from Senegal, Sierra Leone and Ethiopia to the conference. Prof. J. G. M. Massaquoi, the Director of ANSTI, apart from providing funds for the conference was very particular about the sustainability of the programme. For effective coordination, an arm of the Organising Committee was set-up in the NEPAD office, Abuja.

At the end of the 2<sup>nd</sup> African Regional Conference on Engineering Education at the University of Lagos, Nigeria a stakeholders' meeting was held to:

- (i) discuss on how to further continue with the biennial conference
- (ii) consider the need to have an identity for the conference.

It was agreed that (i) the 3<sup>rd</sup> edition of the conference should be held in South Africa and to be hosted by the University of Pretoria in 2006 and (ii) the issue of an identity for the conference was raised and discussed but the discussion was inconclusive. It was slated for further deliberation in South Africa in 2006.

The 3<sup>rd</sup> African Regional Conference on Engineering Education was hosted by the University of Pretoria, South Africa on 26<sup>th</sup> and 27<sup>th</sup> September, 2006. The conference was well attended and many papers were presented.

## **2.0 ESTABLISHMENT OF THE AFRICAN ENGINEERING EDUCATION ASSOCIATION (AEEA)**

At the end of the 3<sup>rd</sup> ARCEE in 2006 at the University of Pretoria, South Africa a stakeholders' meeting was held to finalise the issue of an identity for the conference and to decide on the sub-region to host the next conference. It was agreed after an engaging discussion that the African Engineering Education Association (AEEA) be taken as the name under which the African Regional Conference and other related activities on Engineering Education (ARCEE) would be holding. It was also agreed that the 4th edition of the conference should hold in 2008 in Tanzania, East Africa. The Association was later registered on 05 March, 2012 in Nigeria with the Registration number 50807. The registration documents were endorsed by the President, Prof. Funso Falade from University of Lagos, Nigeria and the former President of Association of Cameroon Engineers, Engr. Raymond Tachago. The official address of AEEA is at the Faculty of Engineering, University of Lagos, Nigeria. The website of the Association is [www.aeeonline.org](http://www.aeeonline.org)

### **3.0 THE OBJECTIVES OF THE ASSOCIATION ARE TO:**

- Promote excellent quality education in various engineering disciplines in Africa and bridge the North-South divide
- Provide a mutual support network of engineering educators, through the established African Regional Conference on Engineering Education (ARCEE).
- Improve teaching and learning in educational institutions, through workshops for engineering and technology educators.
- Mount sensitization programmes on the need for governments' support for engineering education, including the provision of adequate infrastructure and staffing.
- Encourage the involvement of the Africans in Diaspora in the development of engineering education in Africa, through exchange programmes.
- Enhance the development of the next generation of engineering educators, through the establishment of regional Postgraduate Training Centres.
- Promote exchange of students (both undergraduate and postgraduate) across the continent through removal of international fee barriers.
- Strengthen collaboration with other institutions with similar objectives, such as ANSTI, DTCA, AU, NEPAD, WFEO CCB, UNESCO and other relevant regional and International Engineering Education Societies/Associations.
- Promote technological careers for women, so as to increase the proportion of women in the engineering workforce.
- Source and direct funds towards achieving excellence in engineering education in Africa.

- Collaborate with like-minded international organizations to promote research and development in engineering education in Africa.

#### **4.0 STRUCTURE OF THE ASSOCIATION**

A structure was put in place for AEEA to ensure good coordination of resources within the continent of Africa.

Five sub-regions were identified namely, Southern Africa, East Africa, Central Africa, West Africa and North Africa. It was agreed that the President would emerge from a sub-region while the remaining four sub-regions would have Vice-Presidents. The Secretary-General could come from any sub-region. After the Inauguration of the Association the elected office bearers were:

- (i) President: Prof Funso Falade (West Africa), University of Lagos, Lagos, Nigeria.
- (ii) Vice President (North Africa): Dr. Aisa Jadi, The Higher Institute of Engineering, Hoon, Libya.
- (iii) Vice President (Southern Africa): Prof. Chris Pistorius, University of Pretoria, South Africa
- (iv) Vice President (Central Africa): Engr. Raymond Tachago, Alumni Association of Engineers, Yaounde, Cameroon
- (v) Vice President (East Africa): Prof. Burton Mwamila, University of Dar es Salam, Tanzania
- (vi) Secretary General (South Africa): Prof. Duncan Fraser, University of Cape Town, South Africa
- (vii) Liaison Office (South Africa): Dr. Zola Mbaguta, who later became Vice-President after Prof. Pistorius emigrated from South Africa.

The pioneer Secretary-General of AEEA, Prof. Duncan Fraser, died in 2014 and later Prof. Efe Ikponmwosa was appointed to fill the position.

Currently, the office bearers of AEEA are:

- (i) West Africa (President) – Prof. Funso Falade, University of Lagos, Nigeria.
- (ii) North Africa (Vice-President) - Dr. Aisa Jadi, The Higher Institute of Engineering, Hoon, Libya.
- (iii) Central Africa (Vice-President) - Prof. Raymond Houé Ngouna, Saint Jerome Catholic University Institute, Doula, Cameroon (currently in Paris, France).
- (iv) East Africa (Vice-President) - Prof. Henry Alinatiwe, Makerere University, Kampala, Uganda.
- (v) Southern Africa (Vice-President) - Prof. Alfred Ngowi, Central University of Technology, Free State (CUT), Bloemfontein, South Africa.
- (vi) Secretary-General - Prof. Efe Ikponmwosa, University of Lagos, Nigeria.

## 5.0 ACTIVITIES OF AEEA TO DATE

The activities of AEEA to date include:

### 5.1 Organisation of African Regional Conference and Capacity Building Workshop on Engineering Education:

- (a) 1<sup>st</sup> and 2<sup>nd</sup> in 2002 and 2004 respectively at the University of Lagos, Nigeria.
- (b) 3<sup>rd</sup> ARCEE 2006 at the University of Pretoria, South Africa.
- (c) 4<sup>th</sup> ARCEE 2008 at the University of Dar es Salaam, Tanzania.
- (d) 5<sup>th</sup> ARCEE 2013 at the University of Lagos, Nigeria.
- (e) 3-Day Workshop on Capacity Building for Engineering and Technology Educators at the University of Lagos in 2015.
- (f) 3-Day Workshop on Capacity Building for Engineering and Technology Educators in Central Africa between 27<sup>th</sup> and 29<sup>th</sup> April, 2016 at Saint Jerome Catholic University Institute, Douala, Cameroon.
- (g) 6<sup>th</sup> ARCEE 2016 at the Central University of Technology, Bloemfontein, South Africa.
- (h) 3-Day Workshop on Capacity Building for Engineering and Technology Educators at the University of Lagos in 2018.
- (i) 7<sup>th</sup> African Engineering Education Association International Conference (7<sup>th</sup> AEEA-IC) at University of Lagos, Nigeria in 24<sup>th</sup> – 27<sup>th</sup> September, 2019.

### 5.2 In 2008, AEEA co-hosted the 7<sup>th</sup> America Society of Engineering (ASEE) Global Colloquium on Engineering Education and 2<sup>nd</sup> Summit of the International Federation of Engineering Education Societies (IFEES) at the University of Cape Town, South Africa.

The global colloquium was attended by many experts around the globe including Prof. Wu Qidi, the Vice Minister of Education in China who also doubled as a Professor in Tsinghua University. We entered into a conversation with her with emphasis on their assistance for the growth of our new Association - African Engineering Education Association. She facilitated and got approval from Chinese government for a three-week capacity building workshop for AEEA delegates at Tsinghua University, China.

### 5.3 China – AEEA Capacity Building Workshop for 21 AEEA members from the five (5) African Sub-regions was held at the Tsinghua University was mounted between 26<sup>th</sup> November and 16<sup>th</sup> December, 2009. The delegation comprised top African engineering experts from Nigeria, South Africa, Tanzania, Cameroon, Libya, Uganda, Egypt, Morocco, Zimbabwe and Namibia.

### 5.4 Inauguration of the African Engineering Deans' Council (AEDC) took place during the 5<sup>th</sup> African Regional Conference on Engineering Education (ARCEE 2013) in Nigeria, in order to provide additional continental platform for engineering deans to network and take advantage of the collective strength to advance engineering education and research as well as sensitize

stakeholders on the importance of engineering education to economic growth and industrial development globally in general and Africa in particular.

5.5 Production of Maiden Edition of African Journal of Engineering Education (AJEE) in English and French in 2016. Copies were produced and distributed to all attendees of the 6<sup>th</sup> ARCEE in Bloemfontein, South Africa.

It is worth noting that AEEA at different times had invited many African in Diaspora to facilitate at the conferences and capacity building workshops for engineering and technology educators.

## **6.0 DONATION OF MOOC PLATFORM FROM CHINA**

In 2016, Professor Falade was invited to Tsinghua University as the representative from Africa along with others invitees from other developing countries around the world. One of the places visited was the Tsinghua University MOOC Centre (Xuetangx.com). It was requested that the Authorities of Tsinghua University locate the beaming centres of their MOOC facilities in Africa. The request was approved. The proposed implementation strategy suggested the first phase of the project was to be located in West Africa Sub-region with the pilot project at the University of Lagos. The proposal was accepted and the Authorities of Tsinghua University working with the Chinese Academy of Engineering obtained permission from the Chinese government for the project. The platform was developed - <http://unilag.xuetangx.com>. It can also be accessed on google UNILAG MOOC The platform was launched on 22nd May, 2017. It represented the 1st phase in Africa and to be extended to other sub-regions.

## **7.0 PARTNERSHIP WITH OTHER ENGINEERING EDUCATION SOCIETIES/ASSOCIATIONS**

The African Engineering Education Association (AEEA) has relationships with some International Engineering Education Societies/ Associations.

- (i) AEEA is a member of the International Federation of Engineering Education Societies (IFEES).
- (ii) AEEA has MOU with each of the underlisted engineering society:
  - ✓ American Society for Engineering Education
  - ✓ Chinese Society for Engineering Education
  - ✓ Global Educational Supply and Solution (GESS).
  - ✓ Industrial Engineering and Operations Management (IEOM Society).
  - ✓ Korean Society for Engineering Education.
  - ✓ International Centre for Engineering Education, UNESCO Category II Centre, Tsinghua University.

(iii) In 2022, AEEA joined six other engineering education societies to sign an agreement to organize Multi-Society Global Colloquium on Engineering Education (MSGCEE) as an integral part of each society's programme. These signatories are:

- ✓ AEEA – African Engineering Education Association
- ✓ ASEE – American Society for Engineering Education
- ✓ CEEA/ACEG - Canadian Engineering Education Association/Association canadienne de l'éducation en genie
- ✓ CSEE – Chinese Society for Engineering Education
- ✓ JSEE – Japanese Society for Engineering Education
- ✓ KSEE – Korean Society for Engineering Education
- ✓ LACCEI – Latin American and Caribbean Consortium of Engineering Institutions

AEEA is hosting the 1<sup>st</sup> Multi-Society Global Colloquium of Engineering Education in Cape Town in November, 2022 during WEEF which is being jointly organized by the International Federation of Engineering Education Societies, Global Engineering Dean's Council and African Engineering Education Association (AEEA).

## **8.0 CHALLENGES**

There are some challenges that mitigate against the effective running of the African Engineering Education Association (AEEA). Some of these are:

### **(i) Poor Awareness of the Thrust of Engineering Education.**

The concept of 'engineering education' is not well received by many Faculty members in Engineering. Most of the faculty members posit that anybody that wants to work on engineering education should go to faculty of Education. This attitude does not encourage interested faculty members to whole-heartedly participate in the activities of AEEA. For example, in 2013, the African Engineering Dean's Council (AEDC) was inaugurated during the 5<sup>th</sup> ARCEE at University of Lagos. The then sitting Dean was unanimously elected to run the affairs of the organization. But after a period of inactivity, we met him to inquire why nothing was happening and discovered that he was just not interested. We have to plead with the Chairman of the Committee of Deans of Engineering and Technology (CODET) in Nigeria to kindly take up the leadership of AEDC. Publications in engineering education are more often than not considered for promotion. This does not encourage faculty members to carry out research on engineering education.

But I perceive there is light at the end of the tunnel. The level of participation of Africans at the just concluded ASEE Annual Conference in Minneapolis was highly impressive. the African participants were in the categories of those who travelled from the shore of Africa to do their

Ph.D in Engineering Education and post-doctoral candidates in engineering education as well as professors of engineering education in US universities.

### **(ii) Paucity of Funds**

Africa is a resource-constraint continent. It is difficult to raise money for conferences and workshops. When funds are raised and members are funded to attend the programmes the impacts are short-lived. For the same reason there is still a sub-region where no activity of AEEA has taken place since its inception.

The Presidency of AEEA was supposed to be rotated among the sub-regions, unfortunately the inconsistency in the leadership at the sub-regional level has made it impossible. The drivers of the Association have been Nigeria and south Africa. Within the space of time there have been some changes in the vice-presidency in South Africa either as a result of emigration or changes in place of work. We have been driving the Association since its inception to sustain the programme otherwise the vision would have died by now.

The ongoing discussion to actively involve the Africans in Diaspora in the running of AEEA is a step in the right direction.

## **9.0 GOING FORWARD**

The collaboration between those of us that are residents in Africa and the Africans in Diaspora will fast-track the growth of AEEA and further enhance the promotion of the awareness of our colleagues on the thrusts of engineering education and its relevant in the production of quality engineers that are industry-ready after graduation.

The collaboration will also enable us to maximize the opportunities inherent in all the MOUs that we have with other engineering education Societies/ Associations around the world.