

# GLOBAL ENGINEER

IFEES-GEDC QUARTERLY BULLETIN

VOLUME 3 ISSUE 2 | APRIL 2018

## Engineering Education Initiatives in Africa

Women Leaders in Sudan

Collaborating in Tanzania & Malawi

Fostering STEM in Uganda



**IFEES**  
INTERNATIONAL FEDERATION OF  
ENGINEERING EDUCATION SOCIETIES



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Cover Photo: Landscape in Nyika National Park (Malawi)

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## CONNECT



**IFEES**  
INTERNATIONAL FEDERATION OF  
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**GEDC**  
Global Engineering Dean's Council



[IFEES.net](http://IFEES.net)



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**Kristen Fledderjohn**  
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As the International Federation of Engineering Education Societies, IFEES plays an important role in defining a new paradigm in engineering education and beyond.

The global Industry 4.0 / Circular Economy movement is a special challenge for engineering and the engineers. But what is engineering? One most cited definitions is:

*Engineering is the discipline, art and profession of acquiring and applying scientific mathematical, economic, social and practical knowledge to design and build structures, machines, devices, systems, materials and processes that safely realize a solution to the needs of society.*

In short, this means: Engineering is the link between the sciences and society.

Visionaries in Japan already think and speak about “Society 5.0”, which includes all of the changes modern Information Technology causes in all areas of society and not only in industry. Progress in industry—and consequently in society—has always been connected with changes in educational technology. Both are closely interwoven and influenced by the internet, as the basic disruptive technology today and in the future. It is also interesting to observe “The Future of Work at the Human Technology Frontier: New NSF Big Idea Solicitation”, clearly, we are trying to predict “Society 5.0”.

Never before have the challenges in education—particularly engineering education—been as challenging as today.

We are currently observing a significant transformation in the evolution of education. Let us mention below some of the essential and challenging elements of this transformation process that has to be tackled, especially in engineering education.

**On the one hand we observe:**

- the impact of globalization on all areas of human life;
- the exponential acceleration of the developments in technology as well as of the global markets and the necessity of flexibility, transparency, and agility;
- and the enormous (and accelerated) growth of the area of engineering.

Further such challenging elements are:

- the challenging focus of engineering (*shifting from more technical subjects to subjects directed to Information Technologies and the daily life of mankind*);
- the increasing complexity of technical systems, which are more connected with non-technical systems (*social, cultural, environmental, ...*)
- the requirements of a sustainable and circular economy (*because in many fields the natural resources are being depleted; United Nations 17 Sustainable Development Goals*)

**On the other hand we have:**

- new technological reality of learning, the so-called technology enhanced learning (*with the internet as basic technology*);
- the new student generation, who grew up with the internet and is online at any time (*there is a dramatic shift in the way the younger generations experience the world and how students learn today*);
- and an enormous need for highly-qualified engineering graduates globally (*and the numbers will increase*).

What are the consequences? We need a paradigm change in engineering education. We have to renew engineering education in a disruptive manner!

This is exactly what we plan to discuss during our WEEF/GEDC 2018 summit from November 12 through 16, 2018.

Albuquerque, New Mexico, USA, will be the host city for the following events:

- VIII World Engineering Education Forum (WEEF)
- X Global Engineering Deans Council (GEDC)
- XV Global Student Forum (GSF)
- First Global Career Fair (GCF)

**WEEF-GEDC 2018** is the largest engineering education gathering in the world, combining several international conferences in order to bring a large number of diverse stakeholders together to learn, share, and build fruitful and long-term collaborations. Meet engineering educators, academic, industry, and government leaders, students, national laboratories, governmental organizations, non-governmental organizations, multilateral organizations, funding agencies, etc. The theme of WEEF-GEDC 2018 is: **peace engineering—the application of science and engineering principles to promote and support peace.**

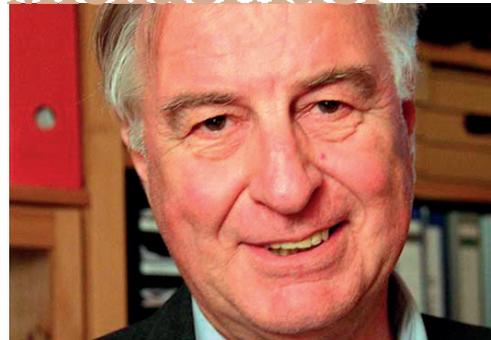
Engineers play a vital role in delivering creative solutions that can radically transform and improve lives. Peace engineering promotes prosperity, sustainability, social equality and diversity, culture of quality, ethics, transparency, innovation, and entrepreneurship.

We invite you to be an integral part of WEEF-GEDC 2018 as a sponsor and/or presenter. The call for workshops, abstracts for posters, and papers is open. For presentation themes and associated information, please see our Call for Abstracts (page 5).

The University of New Mexico School of Engineering, in conjunction with the Ibero-American Science & Technology Education Consortium (ISTEC) and the Global Innovation Network for Entrepreneurship & Technology (GINET), will host the combined WEEF-GEDC 2018 event. This prestigious event, held for the first time in the United States, will also feature a Global Entrepreneurship Challenge.

We welcome you to Albuquerque in November!

**Michael Auer**



IFEES President (2016-2018)

**Ramiro Jordan**



IFEES President Elect (2017-2018)

# EXECUTIVE Committees

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2016 - 2018 | Austria

**Ramiro Jordan**

President-Elect  
2017 - 2018 | United States of America

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First Vice President & Treasurer  
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2017 - 2019 | United States of America

**Peter Kilpatrick**

Immediate Past Chair  
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**Ahmet Öztas**

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2016 - 2019 | South Africa

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Executive Committee  
2017 - 2020 | United States of America

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2015 - 2018 | United States of America

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2017 - 2020 | Nigeria

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Executive Committee  
2017 - 2019 | Spain

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2016 - 2018 | United States of America

**Yao Zheng**

Executive Committee  
2016 - 2018 | China

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Ex-Officio Member (GEDC Chair)  
2017 - 2019 | United States of America

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2017 - 2020 | India

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Executive Committee  
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2015 - 2018 | India

**Michael Auer**

Ex-Officio Member (IFES President)  
2016-2018 | Austria

# CORPORATE Partners





# WHAT DOES PEACE ENGINEERING MEAN TO YOU?



## CALL FOR ABSTRACTS

WEEF-GEDC 2018 Albuquerque, NM, USA

[weef-gedc2018.org](http://weef-gedc2018.org)

The theme of the 2018 conference is Peace Engineering. Peace engineering envisions and works towards a world where prosperity, sustainability, social equity, entrepreneurship, transparency, community voice and engagement, and a culture of quality thrive. Engineers have the power to play a vital role in delivering creative solutions that can radically transform and improve human and natural wellbeing. As we educate future engineers, we must ensure that they embrace their role as engineers of peace. We must provide them with the skills, understanding, capacity for reflection, sense of social responsibility and ethics, and resources to successfully navigate the socio-political impacts of their projects, engage in transdisciplinary developments, and frankly, imagine, design, and create a better world for us all.

We hope you accept our invitation to be part of the WEEF-GEDC 2018 event this coming November 2018. We are providing you the opportunity to submit an abstract for consideration in one of the thematic focus areas listed below. We strongly encourage case studies with practical applications and demonstrable results.

## SUBMISSIONS PROCESS

The abstract submission process for WEEF-GEDC 2018 is through an online portal. For submission instructions, guidelines and templates, click the button below.



## DATES

**Workshop proposal submission**  
April 30, 2018

**Abstract submission**  
May 14, 2018

**Notification of Workshop/  
Abstract Acceptance/  
Rejection**  
June 4, 2018

**Accepted authors submit final paper**  
July 9, 2018

**Notification of paper acceptance & revisions**  
July 30, 2018

**Early Bird Registration Closes**  
August 15, 2018

**Registration deadline for accepted authors**  
August 30, 2018

**Registration deadline for accepted authors**  
September 24, 2018

## THEMES

- How do we teach/learn about Peace Engineering?
- Relationships among academia, industry, governments, multilateral organizations, NGOs
- Hands-on Education/Experiential Learning/Inquiry Learning/Problem Based Learning
- Entrepreneurship in the Circular Economy - 4th Industrial Revolution and Enabling Success
- Other Peace Engineering Challenges

## IFEES and the GEDC sign MoU with WFEO

*Marelene Kanga, WFEO President*

The World Federation of Engineering Organisations (WFEO) and the International Federation of Engineering Education Societies signed a historic agreement to collaborate on projects related to engineering education on the occasion of the WFEO 50th anniversary celebrations held in Paris on 7th March 2018.

The members of WFEO are world professional engineering institutions from some 100 nations. A key strategic objective for WFEO is to progress the United Nations Sustainable Development Goals through engineering. Engineering Education is key to achieving this objective so the partnership with IFEES is very important.

This membership of WFEO complements that of IFEES which has members of engineering education societies from around the world. The agreement will enable the two organizations to develop joint projects and events for the development of engineering education. The organizations will conduct joint activities devoted to promoting and supporting engineering education, especially in developing countries where there is a need to build capacity in this important area. Both organizations will also seek opportunities to cooperate in the preparation of policy statements in area of engineering education which may be made available to national and international organizations.



IFEES President Michael Auer and WFEO President Marelene Kanga shake hands after signing the MoU. Photo courtesy of WFEO.

In particular, the partnership between the two organizations will enable discussion on the experience of engineering accreditation and the effectiveness of Engineering Education standards globally, especially in a rapidly changing technology environment. The two organizations can also collaborate in building capacity among engineering educators in Asia, Africa and Latin America. Both these initiatives will progress the UN Sustainable Development Goal on education (SDG 4.0). Additionally, engineering education is the enabler for the achievement of all the other sustainable development goals so the work to be done is pivotal for achieving these goals.

WFEO was honored and delighted that President Michael Auer spoke at the WFEO Strategic Planning Workshop held on 6th March at UNESCO in Paris and presented a host of ideas that demonstrated the synergy that can be achieved with the two organizations working together. WFEO was pleased that the Symposium celebrating the 50th anniversary of WFEO, held on 7th March at UNESCO in Paris, was attended by President Dr. Michael Auer, General Secretary Dr. Hans Jürgen Hoyer, who also spoke at the Symposium, and Chair of the Global Engineering Deans Council Dr. Natacha DePaola. This was an auspicious start to what WFEO hopes



SEFI representative Françoise Côme speaks with IFEES President Michael Auer and GEDC Chair Natacha DePaola. Photo courtesy of WFEO.

## IAOE Partners with SlideWiki Project

IAOE—the International Association for Online Education, represented in IFEES by Danilo Zutin, is now one of the partners of the SlideWiki Project.

The Project's objective is to create a platform that allows for crowd-sourcing and collaboratively creating OpenCourseWare (OCW). Semi-automatic translation of content into over 50 languages and supporting engagement and networking of educators around the content are additional objectives for the SlideWiki project.

The browser-based platform allows users to import and create slides, share content, knowledge communities, and presentation rooms.

The SlideWiki Consortium is hosting an OCW competition and is inviting participants to create and import quality educational content on the platform. More details about the competition, including guidelines and prizes can be found by clicking [here](#).



On March 8, UNESCO held a joint meeting of key groups for their Engineering Report II. The report is being steered by the International Center for Engineering Education in China. The report will provide a comprehensive look at global engineering education and will be collaboratively compiled and is expected to be released in 2019.

GEDC Chair Natacha DePaola was part of the group, which also included WFEO President Marelene Kanga, ICEE Director Wu Qidi and IFEES Secretary General and GEDC Executive Secretary Hans Jürgen Hoyer.



## The GEDC's Carbon Free Innovation Network to Meet in Chicago This May

On May 14, 2018, GEDC Chair Natacha DePaola will host a workshop for the Carbon Free Innovation Network (CaFIN) at Illinois Institute of Technology (IIT), where she serves as dean of the Armour College of Engineering.

CaFIN was conceived during the GEDC's 2015 annual meeting in Adelaide, Australia and the inaugural meeting was held at McMaster University in Canada in 2016. The event brought together academics, industry and government officials to explore challenges to reducing carbon emissions, pathways to creating a carbon neutral economy and better incorporating green technology approaches into engineering education.

During the 2016 meeting, a declaration was signed between the engineering deans of the Illinois Institute of Technology, McMaster University, the University of Hong Kong, the University of Notre Dame, Seoul National University, and GEDC leadership to pledge their commitment to developing carbon neutral innovations, spurring local and national economies as a result and improving the well-being of nations.

The 2018 meeting will continue developing the CaFIN initiative and work on expanding the network. Deans, faculty, and industry representatives interested in being part of this initiative are welcome to join. More details at [GEDCCouncil.org/CAFIN-18](http://GEDCCouncil.org/CAFIN-18).

## Dassault Systèmes Extends Global Education Initiative to India

In Pune, India, an innovation hub and solar powered passenger vehicle and charging station are the first two projects for La Fondation Dassault Systèmes, who expanded its scope to include India this past February.

Bernard Charlès, the foundation's honorary chairman, notes that "La Fondation Dassault Systèmes leverages the power of experience to transform the way we learn and discover, and ultimately stretches the

limits of knowledge for the benefit [of] all." The foundation provides grants, digital content and skill sets in virtual technologies to education and research initiatives at forward-thinking academic institutions, research institutes, associations and other general interest organizations.

Established in 2015, the foundation had primarily focused on initiatives in Europe and the USA. For more details, visit [lafondation.3ds.com](http://lafondation.3ds.com).

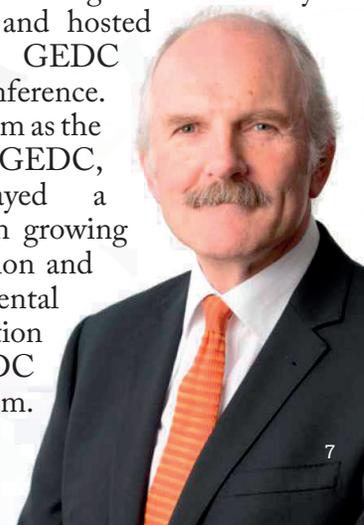


Kantha Reddy (center) from IUCEE was part of a delegation from India that visited Morgan State University (MSU), where he met with Jacob Astatke (right), 2016 GEDC Airbus Diversity Award recipient and Assistant Vice President for International Affairs at MSU.

They explored different ways to collaborate, especially on the use of the latest portable Electrical Engineering instrumentation to improve hands-on learning in universities throughout India. Astatke provided the latest portable board and parts kit for the delegation to share with colleagues in India.

## Former GEDC Chair John Beynon to Retire

Former GEDC Chair John Beynon (2013-2015) will be retiring from his role as Vice President and Executive Dean of the College of Science and Engineering at Flinders University in Australia this June. He formerly served as dean of engineering at the University of Adelaide, and hosted the 2015 GEDC annual conference. During his term as the Chair of the GEDC, Beynon played a pivotal role in growing the organization and was instrumental in the creation of the GEDC Industry Forum.



## Rajarambapu Institute of Technology's High Altitude Balloon Satellite Launch

*Sushma Kulkarni, Director of the Rajarambapu Institute of Technology*

On February 28, students from the Space Club at Rajarambapu Institute of Technology in Sakharale, India launched a high altitude balloon satellite. The first of its kind, it was the highest reaching student balloon satellite from India.

The satellite was built to reach up to the height of 31 kilometers and was dedicated to collecting dust particles. The launch used and tested the LoRa communication system for the first time in a high altitude balloon launch. The entire satellite was designed, developed, launched and recovered by RIT students.

As the balloon climbed at a speed of 1-2 meters per second and followed

horizontal wind flow, the satellite was tracked by a team from the university's space club using the LoRa Communication module and received GPS data every second. The launch received approval from the Director General of Civil Aviation and the Space Club was in contact with the Airport of Authority of India and local authorities throughout the event.

When the balloon's height reached 32 kilometers, it burst over Solapur as planned. The satellite slowly began descending, landing in a village. Farmers, who had been working in their fields, had found the satellite and reached out to the control room to provide the team with the location



of the landing site. The satellite was recovered and delivered back to Islampur.

The Space Club was established in June 2017 and have been working on this project since December 2017.

## Professor Aims to Create Collaborative Capstone Projects

*Submitted by McMaster Engineering*

Andre Phillion, an associate professor in Materials Science and Engineering, wants to smash walls between different disciplines, encouraging students to work collaboratively on capstone projects, the final major assignment of all engineering programs. Recently awarded a new position as a McMaster Engineering Faculty Leadership Fellow, he is working to realize his goal of creating an optional multidisciplinary capstone design project. The idea would allow students from different engineering disciplines to work together in order to solve an industry-driven engineering problem and communicate their engineering design to industry and the public.

“By its very nature, engineering is a multidisciplinary profession,” Phillion said. “Whether it be a modern bridge design requiring electronic sensors for life-cycle monitoring or circuit design

requiring classical heat transfer to ensure the device remains within its operating range, engineering design is most successful as part of a team effort with a range of expertise.”

McMaster students participating in a multidisciplinary capstone would learn about other disciplines and foster

their leadership skills, both of which are desirable skills for future employers, Phillion said.

To read the full article and learn more about Phillion's project and the Faculty Leadership Fellow program, click [here](#).



## Leaders Discuss Engineering's Impact in Latin America

At a working session in Bogotá, Colombia this past February, leaders from several engineering education organizations discussed the importance of the participation of Latin America in engineering. Emphasizing the goal to strengthen the region and have it serve as a global frame of reference, participants explored the regional context of contributions made by engineering.

They focused on engineering's impact in relation to natural phenomena, such as earthquakes and floods; the construction of public policies on engineering education; the quality and accreditation of programs; the training of professors; STEM education and the participation of women. To facilitate advancement of these ideas, the participants committed to present them for their boards' consideration.

The session—which had been organized by ACOFI—included several members of the IFEEES-GEDC community.



ACOFI Executive Director Luis Alberto González Araujo, ASIBEI Executive Director Jaime Salazar Contreras, LACCEI President Adriana Páez Pino and IFEEES Secretary General & GEDC Executive Secretary Hans Jürgen Hoyer.

## International Engineering Educators' Certification Program



A three-day, Phase-I, workshop was organized from Feb 3-6, 2018 as part of IUCEE's International Engineering Educators' Certification Program (IIEECP). 26 enthusiastic faculty from different colleges participated in the training program.

The workshop aimed at introducing faculty to novel strategies of engaging millennial students. Faculty also received training in harnessing technology for effective teaching. GEDC member S. Sudhakara Reddy from the Malla Reddy Engineering College in India, was one of the organizers of the workshop.

## International Online Laboratory Award

Annually, IFEEES member, the Global Online Laboratory Consortium (GOLC), gives awards to outstanding laboratories in three categories. For "visualized experiments", the Sustainable Laboratory Skill Education through Free Online Labs (India) won. For the "simulated experiment", the winner was the Electrical Circuit Lab (Netherlands). The OpenSTEM Labs (United Kingdom) was the award recipient for "remote controlled experiments".

GOLC is a leading international group that brings together researchers and practitioners in all forms of online experimentation. More details about the winners can be found [here](#).



In February, engineering deans gathered together in Maryland and included many several members of the GEDC community. The purpose of the meeting was to discuss strategy related to engineering issues. The meeting also showcased the University of Maryland College Park's new engineering building.

Pictured are GEDC members Steve McLaughlin from Georgia Tech (second from left) and Darryll Pines from University of Maryland College Park and host of the meeting (second from right).

## Blending Learning & Capacity Building

In January, GEDC Member Rupesh Vasani (Gujarat Technological Institute in India) was part of a delegation from Indian Higher Education Institutions visiting Warsaw, Poland to further explore the establishment of a program to improve teaching skills using information and communications technology.

The Work Plan 3 meeting, co-funded by the European Union, was primarily concerned with identifying pedagogical skills gaps, how to identify teachers who will attend trainings and next steps.

The group plans to conduct the capacity building through blended learning, with e-learning courses serving as a precursor to face-to-face courses. This will enhance the effectiveness of the training, simplify training logistics and ensure a cost-effective approach.

## NOMINATIONS OPEN

# 2018 IFEES DUNCAN FRASER GLOBAL AWARD FOR EXCELLENCE IN ENGINEERING EDUCATION

### Nomination deadline May 23, 2018

The IFEES Duncan Fraser Global Award for Excellence in Engineering Education recognizes individuals who have made innovative and meritorious contributions with a significant impact on the advancement of engineering education. IFEES encourages nominations of outstanding candidates from all regions of the world. IFEES will accept nominations until May 23.

The 2018 Global Award recipient will be honored in Albuquerque, USA during the 2018 World Engineering Education Forum (WEEF), which will be held from November 12-16. The recipient will receive a medal, citation, a one-time monetary prize of US \$1,000, round-trip economy class plane ticket, and three nights lodging to receive the award.

Members of the IFEES community are encouraged to nominate an individual who they believe falls within the criteria of having provided extraordinary leadership and impact in engineering education. It is not necessary for the nominee to be a member of an IFEES member society; however, the nominator must be the representative of an active IFEES member society. Guidelines are available in English, French, Spanish, Portuguese and Russian. Nominations must be submitted in English.

If you need assistance, have questions, or are unsure of an IFEES member who can endorse your nomination, please contact [Hans Jürgen Hoyer](#).

[Click here for Award Guidelines and the Nomination Form](#)

## NOMINATIONS OPEN

# IFEES-SPEED YOUNG-SCIENTIST AWARD FOR EXCELLENCE IN ENGINEERING EDUCATION AND PEDAGOGY

### Nomination deadline June 30, 2018

#### Application Process

The application will be in the form of a scientific paper and must include aspects of engineering education and pedagogy. The selection process of applications will be carried out through a double-blind reviewing process with reviewers being specialists in the field of engineering. Applicants must be younger than 30 years old to submit an application.

The submitted application in the form of a full paper should be original, unpublished and not in consideration for publication elsewhere at the time of submission. The winner will have one week to confirm the participation in the event, if confirmation is not given, the Award will be given to second place.

The Award ceremony will take place at the annual World Engineering Education Forum (WEEF) in Albuquerque, USA. WEEF is preceded by the SPEED Global Student Forum (GSF). Authors of the best paper (only one author per paper) will be awarded with: SPEED Membership, coverage of 50% of travel expenses (economy flight); 75% of the combined GSF-WEEF student registration fee (including accommodation).

Work will be included in the WEEF conference proceedings and indexed with other WEEF proceedings. Authors and co-authors will receive e-certificates endorsed by IFEES and SPEED.

[Click here to send an e-mail for more details or to submit an application.](#)

# Engineering Innovation Vital for Economic Development in the Gulf

*One of the region's leading voices in engineering, Dr. Richard Schoephoerster, believes that engineers—and the research they generate—will play a pivotal role in the realization of GCC governments' ambitions to create globally competitive, knowledge-driven economies.*

*Submitted by the American University of Sharjah*

**S**kills of engineers in driving innovation and entrepreneurship have a far-reaching economic impact. Dr. Richard Schoephoerster, GEDC Member and Dean of the College of Engineering at the American University of Sharjah (AUS) in the UAE, believes these skills will generate jobs and boost trade and commerce.

“Engineers have a vital function in the development of the economies of the Gulf Cooperation Council (GCC). [They have] both a direct, and indirect impact, in terms of both Gross Domestic Product (GDP), and employment” Schoephoerster explains. Indeed, the solutions to many of the economic challenges we currently face will come from engineers, including finding reliable energy alternatives as the region diversifies away from oil; developing intellectually-based industries to supplement declining oil prices; and imagining new systems and processes that will make existing GCC industries more robust and internationally competitive.

“Engineers are often responsible for spawning the technology that will address these problems, generating new products and new businesses in the process. The entrepreneurship initiated by the innovations of engineers has a significant flow-on effect for the wider economy, fostering jobs across a plethora of industries, and generating trade and commerce, here and abroad.”

For Schoephoerster, it essential that more people in the region receive a world-class engineering education, at both an undergraduate and graduate

level. He says that having a workforce of highly skilled and knowledgeable engineers, and engineering research that leads to development of intellectual property, is critical to having countries in the GCC meet their economic goals.

“Several of the goals articulated by the UAE’s Vision 2021 are inextricably linked to engineering education and research. Goals such as creating a sustainable environment and infrastructure; developing a world-class health-care system; and achieving a competitive knowledge-based economy, will all rely on having a strong cohort of engineers across a number of engineering disciplines, and a well supported research enterprise. Having the facilities in place to educate a requisite number of students in engineering fields, and support of engineering research, will have long-term benefits for the UAE, as well as many of its neighbors who share similar aspirations for their economies and societies.”

AUS’ College of Engineering is being proactive in educating future-fit engineers, and facilitating research which will contribute to innovation at a national level. The university, under the patronage of His Highness Sheikh Dr. Sultan bin Muhammad Al Qasimi, Member of the Supreme Council of the United Arab Emirates and Ruler of Sharjah, is investing heavily in the research capacity of AUS, allowing its faculty and students to pursue a higher number of research projects. Areas in which researchers are making significant headway include robotics, energy harvesting and cancer treatment.

In the field of robotics, a team from the College of Engineering have developed a robot that can detect leaks in oil and gas pipelines. Using an algorithm that enables high accuracy localization, the robot overcomes navigation problems often associated with in-pipe inspection robots. Wireless communications allow the operator to use the device remotely and receive real-time data, making it easier to find and repair leaks. Last year, the project received AED 1 million when it won the UAE AI and Robotics for Good. With the region’s continued reliance on oil and gas, the development of the robot looks set to receive widespread attention from investors.

AUS is spearheading a number of projects involving energy, cancer treatment, and much more. The upcoming establishment of the Sharjah Research, Technology and Innovation Park adjacent to the university will allow projects such as those mentioned above access to investors, making commercialization of innovations a real possibility.

Schoephoerster notes, “Too often important engineering breakthroughs do not have the economic impact that they should, because investors do not know that they exist. The College of Engineering at AUS is mindful of this, and puts in place mechanisms that allow for the great work our researchers do to reach the market. The new Sharjah Research, Technology and Innovation Park will provide an excellent opportunity for outstanding research work to reach the market, and make a real impact not only in the UAE, but around the world.”

# The Role of Higher Education in the Face of the Social Challenges in Latin America and the Caribbean

*Submitted by ASIBEI Executive Secretary, Jaime Salazar Contreras, who moderated the panel.*

**R**ectors from institutions in Ecuador shared their insights on higher education in Latin America and the Caribbean during ASIBEI's annual meeting. The panel consisted of four rectors from institutions in Ecuador: Jaime Calderón Segovia (National Polytechnic School in Ecuador), Fernando Sempértegui Ontaneda (Central University of Ecuador), Colonel Ramiro Pazmiño (University of the Armed Forces) and Marcelo Cevallos (Universidad Técnica del Norte). The panelists focused on three questions geared towards understanding the current conditions of higher education in the region.

## What are the social challenges that universities must address?

The university is a public good whose educational offering must respond to social needs. The university's duty is to choose a destination, seek human development and increase opportunities so that more people can realize their life project. The university must work in micro-territories—in collaboration with municipal authorities and local communities—to define interventions and improve on the quality of life. This commitment demands work of a holistic nature, framed in a true ethics of knowledge, based on scientific research, and articulated with the corresponding process that enriches and complements professional training.

The university's challenge is to help reduce poverty and inequality, which is an injustice in a region graced with abundant natural resources. This responsibility is in line with findings from the Economic Commission for Latin America and the Caribbean, an organization that highlights inequality

as one of the negative elements that impede improving the distribution of wealth.

Universities must propose viable, innovative, sustainable and competitive solutions that ensure a positive impact on society. In order to adequately address this purpose, it is imperative to strengthen institutions of higher education—especially public universities—to enable them to generate their own capacity for scientific and technological production. This serves as a way to connect with the basic needs of society while simultaneously providing a new economic model based on knowledge that is promoted to guarantee rights and expand the coverage of higher education without having to abandon the commitment to quality education.

Latin American universities need to consolidate the current models and adjust the pedagogical model, contents and practical training of engineers. As outlined in the proposal of the [Profile of the Ibero-American Engineer](#) (developed by ASIBEI), academic transfer and mobility between countries is essential. The Ibero-American open lecture on technological development and innovation must be incorporated into the curricula throughout the region to reinforce basic skills for engineers.

## With the original concept for universities blurred by accentuation of commercialization in higher education, how does this impact the fulfillment of a university's mission?

The central issue is to prevent higher education from being treated as a commodity and subject to the rules of a lucrative business. Universities focused on the educational business do not sufficiently invest in laboratories, direct their offers to low-investment careers and lack experimental components. Faced with a proliferation of institutions offering programs without infrastructure support or

higher level teaching, evaluation is needed to determine if these should be called universities.

Undergraduate training must be robust enough to guarantee a suitable professional exercise. Presently, it is not at an adequate level for the interests of academic development or economic growth in countries offering graduate programs to supply the deficit of professional training of engineers. This reality excludes a large part of the population, namely the lowest strata society—especially in the case of public universities.

To meet their mission, universities must seek ways to articulate and treat their functions equitably—seeking balance in recognition and assessment and teaching work in the classroom, while supporting research that leads to publication and the commercialization of research products. It is necessary to evaluate the impact and relevance of publications, especially in consideration of whether they really contribute to solving local problems or only favor the advancement of knowledge and production in industrialized countries.

## What ethical considerations should these challenges contain?

The most important ethical challenge of education is to contribute to the reduction of gaps and inequality. The university's primary ethical duty is to train and deliver highly qualified professionals to society—and give each young person the opportunity to impress values on their lives through the responsible exercise of freedom and autonomy, strongly influenced by the example of their teachers.

Higher education institutions are committed to providing society with professionals that contribute to the development of countries, who respect nature, scrupulously use public resources and are ethically strong enough to resist and defeat the provocations of corruption.

# Women Leaders in Sudan

## Success Stories and Challenges

*Tagwa Musa*

*Dean at the Sudan University of Science & Technology*



**S**udanese women have professionally distinguished themselves in every career level and are well-known in this regard in their African and Arab countries and regions. They are pioneers of the sciences, arts, medicine, engineering and other practical fields. They have proven themselves invaluable to nearly every business sector, both, within Sudan and abroad—while representing the majority of many.

Since the 1960s, they have been entitled to a pension and a salary equal to their male counterparts. The 1998 Sudanese Constitution provided women with the right to participate in the legislative, executive and judicial branches of government, with 25% of seats in parliament allocated to women between 2005 and 2015, with a 30%

increase (131 women) by 2020<sup>1</sup>. A Sudanese woman was nominated for the presidency of the country in the 2010 general election. In academia, there are several relevant positions for women. They are heads of departments, deans and vice chancellors distributed throughout all of Sudan's 30-plus public universities.

The Sudan University of Science and Technology (SUST) has 25 colleges, five of which are engineering related. Three of the deans are female, including the author, Tagwa Musa, who is serving as the Dean of the College of Petroleum Engineering and Technology. SUST also has 22 research centers and institutes with seven female managers. In its entirety, SUST consists of 117 departments, with 42 women serving as department heads, holding approximately 36% of the positions<sup>2</sup>.

## Personal Achievements and Challenges for Women in Leadership Positions

This article focuses on the Musa's own experience as the Dean of the College of Petroleum Engineering and Technology since November 2014. Currently, the college has 38 faculty members, 20 employees, and 25 workers. Females respectively occupy 36%, 65% and 80% of roles. However, of the 1,003 undergraduate students enrolled in 2018, only 96 students are female—only 9.6 % of the total number of the students in the college<sup>3</sup>.

Based on the author's own experience as a dean for one of the essential colleges at Sudan's most prominent university, she has witnessed the leadership of the university take interest in recruiting and retaining women for management positions and supporting them. Musa has had a very positive experience with the opportunities the university leadership offers to her to lead many initiatives and to represent the university locally, regionally and internationally. These incredible opportunities have allowed her to build character, show her strength and develop a network of privileged relationships. However, such tremendous commitments also represent a significant challenge for personal life and the family needs. This delicate balance between family needs and work requirements are quite challenging, requiring her to juggling responsibilities.

The work nature in academia in general, is not that difficult, particularly in the areas of teaching and research; however, sometimes the management duties are incredibly exhaustive, especially if staff and operations require frequent follow-up. The staff Musa manages a culturally diverse staff from different educational backgrounds. The pressing challenge for women in

the engineering field—especially in petroleum engineering—is that they have to be a part of an industry that also requires fieldwork. Some duties and long-term job commitments, specifically in oil and gas fields, are not acceptable in our culture and represent severe challenges for married women and others.

Based on Musa's experiences, the judgment of women in leadership roles depends on the impressions from staff and peers. Typically, a woman in such positions will be exposed to many tests. Few describe her as an "iron woman", while others refuse to accept her leadership role and assume that she is too thin and soft to be a dean.

Despite these challenges, Musa has been quite successful in creating a healthy work environment and maintaining productivity while working with many male leaders. Nevertheless, as a professor, she has been seriously challenged to find the time for research and other essential activities related to her field and academic recognition as been hindered due to the extensive service and administrative roles required of the dean of the college.

### Are Women Supporting Women Leaders?

Many women struggle to find better ways to balance work and personal lives, and often guilt stems from outside sources, like pressure from husbands, family and friends.

Musa's leadership has sometimes left her standing helpless to defend the women in her college because there are so many challenges. Some of these challenges she identifies include:

*Frequent requests for leave (in Sudanese culture requests can be made for marriage festivities, family issues*

*such as illness in the immediate family, maternity leaves, escorting the husband and children, etc.)*

*In some cases, female staff request Musa to engage in marital disputes; e.g., expecting her to obtain a permit from the husband if Musa needs a female staff to do additional work.*

*Staff and faculty are required to get their husbands' permission to travel. Such restrictions limit access to training opportunities or promotion.*

*Women at all levels of employment and all levels of the workplace are affected by sexual harassment—especially students and younger teachers.*

*The Sudanese oil fields are not well prepared to receive females, so the training opportunity for girls is limited to an office, with only a one-day visit to the field. The challenge for the leader is to search for another solution to meet the technical needs of female students.*

In summary, there significant success stories for Sudanese women in comparison with the region and among those with a similar culture. It also sheds the light of the author's own experience as the dean of one of the country's most massive engineering programs. However, there are still significant hurdles for potential women leaders in Sudan.

### References

- <sup>1</sup> Sudan National Assembly record and communication reports.
- <sup>2</sup> Human Recourses of SUST Annual Report of 2017
- <sup>3</sup> Records of the Registrar of the College of Petroleum Engineering and Technology, SUST, 2018.

# The Collaboration and Sharing Project

*Engineering educators collaborating and sharing student-centered teaching and learning methods through team teaching*

*Esther Matemba & Mark Hodge*

**T**he Collaboration and Method Sharing project is an initiative for engineering educators to collaborate and share student-centered teaching and learning methods through team teaching. This interdisciplinary teaching and learning (T&L) model incorporates professional skills of communication, teamwork, critical thinking, research and social knowledge which are all embedded within the learning of technical skills.

The founders of the project, Esther Matemba from an engineering background, and Mark Hodge from a humanities background are the main actors in this project. They have vast experience in a variety of student-centered learning approaches and they have witnessed the benefits of student-centered learning approaches, through experience teaching in African institutions, one being trained in Tanzania. It is their mission to introduce fellow engineering educators in Africa, and their students, in their own learning environments to these methods through interdisciplinary team teaching using student-centered methods.

## Student-Centered Learning and Non-Formal Education

Issues in engineering education are becoming more complex/challenging/prevalent with rapid changes taking place globally. There is a worldwide call to transform engineering education from a content based teaching style to student-centered teaching and learning, adopting inductive teaching methods such as project-based learning, problem-based education, just-in-time teaching, and inquiry learning. This is in line with the current

world job market that has become multicultural and multidisciplinary, requiring engineers to graduate with broad skills beyond their technical abilities. Student-centered education is an inductive approach to teaching and learning that has been successful in promoting deep learning. This has been credited for the development of skills such as critical thinking, lifelong learning, problem solving, teamwork and communication, all vital for engineering practice. Studies have also shown that student-centered teaching and learning methods such as problem-based and project-based learning are highly recommended because of their ability to cover a broad range of engineering skills while including the social elements required in the engineering profession.

However, despite evidence of success in student-centered learning approaches, particularly in developed countries, there is still resistance by educators to adopt these methods because of their preconception that good teaching is transmission of information. There is a possibility that this resistance among educators may be due to insufficient exposure or a lack of experience in these methods. In other words, the lack of guidance, mentorship, and awareness of the benefits can lead these educators to feel unacquainted or uncomfortable in implementing these new methods. Matemba and Hodge believe that a non-formal learning approach will be a suitable way to help familiarize these educators with student-centered methods. Non-formal learning has proven to be a more effective and preferred approach, for teacher training, than formal workshops, lectures and seminars.

The Collaboration and Method Sharing for Engineering Educators Project uses a non-formal concept of learning for educators to be

more effective in interdisciplinary collaborative teaching which in turn fosters professional development for academics. The approach involves Matemba, Hodge and African engineering educators collaboratively designing and delivering a one week student-centered T&L model at their international host institution, learning through practice and interaction.

## The Model

The one week T&L model is based on a course delivered to first year students at Curtin University in Western Australia. It uses the problem based learning (PBL) approach to integrate the teaching of technical skills, professional engineering skills. The approach, that requires students to design solutions to solve real life problems, has been drawn from Engineers Without Borders (EWB) projects, and applied at various universities in the United States, Australia and Europe, with evidence of success. PBL has also been recommended by local and international organizations for developing a more competent African engineer of the 21st century. The World Bank report in 2014, on Improving the Quality of Engineering Education and Training in Africa, recommends PBL to improve student problem solving skills and the acquiring of soft skills such as communication, team spirit, creativity and adaptability.



GEDC member and Dean of Engineering at the University of Malawi - The Polytechnic Thresea Mkandawire (front row middle) with the authors, Esther Matemba (front row left) and Mark Hodge (front row right).

## Project Aims

The main aim of Collaboration and Method Sharing for Engineering Educators Project is to establish collaboration in engineering education practice, between Australian and African educators for the purpose of sharing interdisciplinary student-centered methods of teaching and learning while students practice important professional engineering skills. The specific objectives of the project are:

*To demonstrate a teaching model and curriculum that integrates the learning of technical and professional engineering skills alongside communication skills in a single course (where the method has not yet been applied).*

*To facilitate student understanding and appreciation of important engineering roles by establishing and practising important skills including problem solving, communication, teamwork and design skills with the preface of developing their professional identity.*

*To stimulate discussions in Engineering Education Teaching and Learning between the two key Engineering faculties in Africa and Australia by bringing together academics and industry.*

*To establish a working relationship between educators from the two countries, that will allow sharing of knowledge and experience, through team teaching in the two countries.*

*To present findings of the project through peer-reviewed publications, institutional, national and international forums and conferences with the aim of the model being endorsed by disciplines other than engineering.*

## Project Outcomes

The project is expected to achieve five

main outcomes which are: (1) To be positively perceived by participants, (2) Adoption of the model (3) Students developing intended professional skills (4) Continued collaboration among educators, and (5) Project sustainability. Data will be collected throughout the project through surveys, observation, focus groups and interviews then analyzed based on its success in achieving the five main outcomes.

## Pilot Stage: Malawi and Tanzania

Pedagogies involving implicit involvement of students in teaching and learning (T&L) activities, as in the engineering foundations units at Curtin University have been shown to promote communication, teamwork, social knowledge skills and life-long learning. Preliminary investigations at the University of Dar-es-Salaam (UDSM) in Tanzania and the University of Malawi - The Polytechnic (The Polytechnic) indicate that such pedagogies are either not in place or not explicitly practiced in many universities in Africa.

The proposed project intends to introduce both engineering educators and students at UDSM and The Polytechnic to an interdisciplinary T&L model that entails the facilitation of students in a step by step process, to research and provide simple solutions to real life design problems. During this design process, they will be guided in the application of key engineering professional skills, like communication, teamwork, problem solving, decision-making, and reflective practice, to complete group submissions including a design report, a poster presentation and a reflection. This method will create, for the students, a better understanding of engineering practices and development of professional identity in a practical way.

The project consists of 2 phases completed over 2017 and 2018: (1) Fine-tuning content and logistics of delivery of model and (2) Delivery of the model.

Phase 1 involved the recruiting of

local educators and industry volunteers, organizing a delivery venue, participants and other logistics. This stage involved designing an appropriate curriculum for a short course with a clear set of intended learning outcomes (ILOs). Learning activities including levels and assessment tasks that are meant to meet the ILOs using constructive alignment practice.

Phase 2 involves collaborative delivery of one week program of the model/curriculum. In the program, volunteering students will be facilitated in a task to provide simple solutions to a real-life problem through the application of a step by step design process.

## The Future

Currently the project is at its pilot stage with the first phase being successfully completed in September 2017 involving interested educators from Tanzania and Malawi where the project was positively received by the participants. The University of Malawi The Polytechnic has asked Matemba and Hodge to proceed with phase 2 of the program and present the condensed course to approximately 400 students during orientation late in 2018. This will involve, as well as the students, educators from Malawi and Australia.

The authors believe that this project is a friendly and convenient way of establishing collaborations between engineering educators while creating a better understanding of engineering practices and the development of a professional identity for the students. Further, the method used can be adapted to a target audience in disciplines other than engineering to demonstrate realistic ways of engaging students with real life tasks that can achieve successful long-term learning.



Esther Matemba presents the project during WEEF 2017 Kuala Lumpur.

# Promoting STEM Subjects Through Learning Labs

**With one of the fastest growing populations in the world, engaging children in STEM could be the key to Uganda's future**

*Olema Vincent, Coordinator at Logik Labs*

Uganda has one of the highest rates of population growth in the world, with a large young population and high levels of unemployment. Uganda largely depends on agriculture with few other sources

of livelihood. However, climate change has shifted weather patterns leaving farmers unable to predict the rains. Farmers are grumbling about poor yields and food insecurity. Investing in STEM education and promoting innovation is Uganda's only option to resolve problems that include youth unemployment and inadequate resources.

This can only be done when Uganda and its partners promote STEM subjects in schools and inspire students to pursue science, technology, engineering and mathematics related professions. In Uganda's higher institutions, the number of students pursuing art courses is significantly higher than the number of students who pursuing STEM degrees. Drawing on my experiences going through Ugandan education system to become a telecom engineer, I have developed an innovative the Learning Lab to promote STEM subjects in Uganda. The Learning Lab provides a complete setup to engage children in STEM subjects. The lab also includes English literacy in an attractive way, and enables learning even without guidance from qualified instructors.

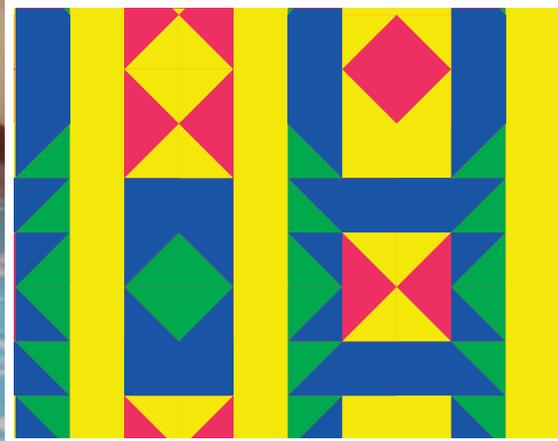


**The Learning Lab's colorful environment & interactive elements provide an attractive setting for children to engage in STEM**

The Learning Lab is stocked with hands-on learning materials from tablets which are fully installed with educational application software, to locally available materials such as bottle tops, dolls, pegs, stones, strings, Lego products and other relevant resources.

The Learning Lab is specifically designed to enhance Uganda's curriculum at the primary level. The educational system is adapted from the British System, which consists of: pre-primary, seven years of primary, four years of secondary education (Ordinary/O Levels), two years of upper secondary school or better known as (Advance/A Levels) and three to five years of post-secondary education, depending on the field. Furthermore, the lab promotes STEM and literature currently used in lower primary schools. Presently, we are working with the Kalinaabiri Primary School, in the Nakawa Division of the Kampala district.

The Learning Lab is designed with colorful materials to attract children's attention, and is stocked with games to make learning more interactive and engaging. Our studies have demonstrated that children can only concentrate between 30 and 40 minutes; however, the children always like to play inside the lab and when the classes are large, learners can be organized in groups so that each learner can engage in their own learning process.



**The Learning Lab is based in a primary school in Kampala and offers an array of learning apps to teach STEM and English literacy. The intuitiveness of the tablets allows the technology to be accessible.**

The Learning Lab emphasizes that the learning environment should be as safe as possible, where both the instructor and learner feel free and at peace in the learning process.

Additionally, although most of the Learning Lab is located at the Kalinaabiri Primary School, the neighboring schools can bring their students to the Lab, with no fee.

The full curriculum—with basic STEM topics, reading and writing aspects—has been converted into 100 unique apps tailor-made by pedagogical experts.

The apps, installed in Lenovo tablets for kids to access, help enhance regular classroom lessons. These touchscreen tablets offer possibilities for children to explore learning in a digital way. The tablets also provide easy interaction on the touchscreen and access to a multitude of intuitive, engaging learning applications.

The cognitive ability required to use the tablets is low and allows the children to learn very quickly. In observations of Learning Lab interactions, we have

found that the children are exposed to learning and practicing skills in an engaging and interactive environment since there are an array of games for the kids to play with and learn.

The Learning Lab is provided with different learning materials for kids, and includes Lego education materials, stones, cardboard materials, books, pencils, other science practical kits. The kids are left to come up with what they want to work on based on the topic to be covered. They can choose to play with Lego learning materials and build objects like cars, houses, etc. Some of the topics are elected from IEEE's education website, [TryForEngineering.org](http://TryForEngineering.org).

The Learning Lab is maintained by a volunteer teacher from the Kalinaabiri Primary School with a STEM background. He is responsible for the topics to be covered in the lab, organizes the lab for the next class and other tasks necessary to facilitate a positive and impactful learning experience for the children.

Since launching the Learning Lab

one year ago, it has become a tool with positive impact on kids to start loving science, technology, engineering and mathematics. The English literacy component introduced in the Learning Lab also helps children improve their English. The Learning Lab could become a promising tool for preschool and primary children to learn innovative skills to ignite a passion to pursue STEM careers in later years.

Although this study is helpful in illuminating the possibilities of how the Learning Lab can be used as method of promoting STEM subjects in primary schools in Uganda, it has limitations. It is still too early to determine whether the kids who are presently using the learning Learning Lab will pursue STEM careers in future. It is also important to point out that some of the learning materials are still expensive; like tablets, Legos, etc. It is not easy to get collaborators who are interested in promoting STEM through Learning Lab in Ugandan Primary Schools.

## Featured Dean

# KEN BALL



*Kenneth S. Ball, Ph.D., P.E. has served as the Dean of the Volgenau School of Engineering at George Mason University since 2012 and is a member of the GEDC Executive Committee. In late 2017, IFEES and the GEDC accepted Ball's invitation to host the Secretariat.*

### What benefits and opportunities do you envision hosting the IFEES and GEDC Secretariat at GMU?

I am delighted that George Mason University is able to host the IFEES-GEDC Secretariat. When exploring this possibility over a year ago with Hans, it was clear to both of us that this could be a real “win-win” situation for IFEES and Mason. Mason is the largest public research university in Virginia, and is in the U.S. National Capital Region with Washington, D.C. being a very short distance from our three largest campuses in Arlington, Fairfax, and Manassas, Virginia. We are convenient to three major airports—with many direct international flights to major cities all over the world. Washington, D.C. is a truly an international metropolitan area, home to many foreign embassies and consulates and attracting approximately 25 million visitors annually. This makes us a very logical and beneficial location for an organization that is global in its reach and scope.

We hope that Mason can serve as host for many meetings, workshops, and conferences affiliated with IFEES and GEDC over the years to come. We also will be working with Hans and IFEES-GEDC to develop our own institution's strategic plans for advancing engineering education in a global context, and engaging our faculty and students in global programs and initiatives.

Global engagement is also a key strategic goal of George Mason University. Mason seeks to expand opportunities for global learning by creating partnerships and programs to support student and faculty mobility and collaboration. One of our campuses is located in Songdo, Korea. We are committed to building a community that fosters global learning, creates global understanding, and seeks global impact. We hope to leverage our association with the IFEES-GEDC Secretariat to advance our global engagement.

### How do you manage relationships with corporate partners and what are some impacts of these relationships?

We are extremely fortunate to be located in the National Capital Region of Northern Virginia, which is home to thousands of companies. There are 15 companies on the Fortune 500 list that are headquartered in the D.C. area, including well-known government contractors. At Mason, we have developed strong relationships with dozens of corporate partners that benefit our students and faculty in many ways. Obviously, these companies hire many of our students, providing them with excellent career opportunities. A large number of our students also gain valuable work experience before they graduate through internships and cooperative education work experiences, not to mention part-time

employment during the academic year. A significant number of our capstone senior design projects are sponsored by companies in the region. Every academic program that we offer has an Industrial Advisory Board, and the Volgenau School of Engineering also has a large advisory board comprised of C-level executives from more than a dozen companies, as well as a number of retired executives and military leaders. Senior executives from a number of important government agencies are also represented on our advisory board. These advisory boards provide extremely valuable advice and guidance to support our academic programs in various ways. For example, they helped us to develop our relatively new degree programs in cybersecurity engineering (BS) and data analytics engineering (MS), both of which have proven to be highly successful with more than 300 students enrolled in each program after only three years. In a typical semester, we appoint approximately 150 adjunct professors—working professionals who teach classes that are highly relevant and who can offer a real-world perspective to our students.

To help manage all of these relationships, I have appointed an Associate Dean for Strategic Initiatives and Community Engagement and I also meet regularly with our advisory board's executive committee (approximately once per month).

### How does GMU sustain growth and increase diversity?

We are very fortunate to be located in a state that is growing in population. We are not experiencing the decline in the college-aged demographic that afflicts other regions of the country.

We also benefit from having the second largest community college system in the U.S. in our region, Northern Virginia Community College (NOVA), with whom we have nurtured a strong and mutually beneficial relationship. In some programs, as many as half of our students transfer from NOVA, after earning an Associate's Degree. A new partnership will assist students as they transfer from a two-year to a four-year undergraduate degree. Since the student population entering higher education through a two-year institution is demographically more diverse, our own student population will become much more diverse as well. Mason already is a minority-majority university, with more than half of our student population coming from underrepresented groups. We have a particularly large percentage of students who are first-generation Americans and first-in-their-families to attend a university, not to mention a large population of "Dreamers." Northern Virginia is ethnically a very diverse place, and our student population reflects this.

Like most engineering programs, we would like to see more women enroll in our programs. We have a number of outreach programs that have proven to be very effective to meet this goal. The number of young women who have participated in our outreach programs grows every year.

### What are your top five priorities as dean, and where do you plan to take the VSE over the next five years?

My top priority as dean is to sustain the amazing growth that we have experienced over the past five years.

When I began my tenure in 2012, VSE's enrollment was approximately 4600 students with about 160 full time faculty members, and our annual research expenditures were around \$18 million. Next fall, we expect to surpass 8200 students, and 230 faculty members, with expectations to exceed 10,000 students and 325 faculty members over the next four years. The most recent Carnegie classification of research universities added Mason to the ranks of the top tier "R1" research universities.

We will most likely develop several new degree programs, working with our corporate partners and advisory boards to identify current and projected workforce needs, and will expand our online course and degree offerings and professional education programs. Finally, we hope to significantly broaden our global engagement and establish many new partnerships with other institutions and organizations around the world.

### What are some significant issues that ought to be addressed by the global engineering dean community?

I am convinced that broadening participation in engineering, both in the U.S. and globally, will have an enormous positive impact on all societies worldwide. Our best chance for lasting peace and prosperity everywhere is to enhance the quality of life for all people. I am a big fan of the U.S. National Academy of Engineering's Grand Challenges and the Grand Challenge Scholars

Program—if successfully conquered, will transform lives in ways that everyone can understand.

In the U.S., less than 5% of all college majors are in engineering. Worldwide, this number is harder to estimate but is likely around 20% to 30%. How can we dramatically increase the number and diversity of our engineering students? How can we dispel widespread and mistaken stereotypes about engineering, such as all engineers are socially inept and we all design and manufacture gears and automobiles? Just try doing a Google image search with the keyword "engineer" and count the number of images of gears that appear!

Once it is widely understood that the world's most pressing problems can be effectively addressed and solved by engineers who have had a broad education with global experiences to extend their worldview and cultural awareness, we will begin to see real progress towards broadening participation in engineering. We all must work together to advance our profession worldwide, and IFEEES-GEDC certainly will play an essential role in bringing us together as leaders in engineering education to establish best practices, to create new programs and partnerships, and to expand our influence as a global engineering community to create peace and prosperity on every continent for all nations.

**Read Ken Ball's full interview at [GEDCouncil.org/Featured\\_Dean](http://GEDCouncil.org/Featured_Dean).**



Volgenau School of Engineering

# UPCOMING EVENTS

## ASIA

### **Asian Engineering Deans Summit (AEDS)**

May 21-23, 2018 | Tokyo, Japan

### **IFEES-IIDEA Workshops at Tsinghua University**

July 6-7, 2018 | Beijing, China

### **Engineering Education Forum (Beihang University)**

July 7-8, 2018 | Beijing, China

### **IUCEE Leadership Summit and Industry Forum**

July 19-21, 2018 | Goa, India

### **Japanese Society for Engineering Education Annual Conference (JSEE)**

August 29-31, 2018 | Nagoya, Japan

### **2018 Engineering Education Conference (KSEE)**

September 13, 2018 | Jeju, South Korea

### **Tsinghua University, IACEE & Aalborg University meeting**

September 18-22, 2018 | Beijing, China

### **International Forum on Engineering Education & Industry Practice (Tsinghua University & Quanser)**

September 24-25, 2018 | Beijing, China

### **Asian Deans' Forum 2018 - Rising Stars Women in Engineering Workshop (HKUST)**

October 4-7, 2018 | Hong Kong, China

### **International Conference on Wireless Networks & Embedded Systems (Chitkara University & IEEE)**

November 16-17, 2018 | Punjab, India

### **6th International Conference on MOOCs, Innovation & Technology in Education (MLR Institute of Technology)**

November 29-30, 2018 | Hyderabad, India

### **IEEE Globecom 2018 (Khalifa University)**

December 9-13, 2018 | Abu Dhabi, UAE

## NORTH AMERICA

### **First Annual Collaborative Network for Engineering and Computing Diversity Conference**

April 29-May 2, 2018 | Crystal City, USA

### **GEDC-CaFIN Workshop (Illinois Institute of Technology)**

May 14, 2018 | Chicago, USA

### **Institute of Industrial & Systems Engineers Annual Conference (IISE)**

May 19-22, 2018 | Orlando, USA

### **16th IACEE World Conference on Continuing Engineering Education**

May 22-25, 2018 | Monterrey, Mexico

### **2018 Global EPICS Symposium and Workshop**

June 11-15, 2018  
West Lafayette, USA

### **IFEES President's Round Table**

June 24, 2018 | Salt Lake City, USA

### **IFEES-GEDC Reception & Dinner**

June 24, 2018 | Salt Lake City, USA

### **2018 American Society for Engineering Education Annual Conference & Exposition (ASEE)**

June 24-27, 2018 | Salt Lake City, USA

### **28th Annual International Council on Systems Engineering International Symposium (INCOSE)**

July 7-12, 2018 | Washington D.C., USA

### **North American Materials Education Symposium (Granta Design)**

August 16-17, 2018 | Ann Arbor, USA

## SOUTH AMERICA

### **IV International Congress of Research & Innovation in Food Engineering, Science & Technology (ACOFI)**

May 16-18, 2018  
Cali, Colombia

### **Polytechnic Summit 2018**

June 4-6, 2018  
Lima, Peru

### **LACCEI 2018 - Summit of Engineering for the Americas**

July 18-20, 2018  
Lima, Peru

### **International Symposium in Innovation and Technology (IIITEC)**

August 6-8, 2018  
Ica, Peru

### **GEDC-Latin American Annual Meeting**

September 10-11, 2018  
Milagro, Ecuador

### **International Meeting of Engineering Education (ACOFI)**

September 18-21, 2018  
Cartagena, Colombia

## EUROPE

### **10th European Convention for Engineering Deans (SEFI)**

May 27-29, 2018 | Trondheim, Norway

### **International Engineering Alliance Meeting**

June 24-29, 2018 | London, United Kingdom

### **European Society for Engineering Education Annual Conference (SEFI)**

September 18-21, 2018 | Lyngby, Denmark

### **International Society for Engineering Pedagogy Annual Conference (IGIP)**

September 25-28, 2018 | Kos, Greece

# CALL FOR PAPERS

## **European Society for Engineering Education Annual Conference**

*Creativity, Innovation and Entrepreneurship for Engineering Education Excellence*

Paper submission deadline: April 30 2018

[Conference Website >>](#)

[Call for Papers >>](#)

## **Japanese Society for Engineering Education International Session**

*International Cooperation in Engineering Education*

Paper submission deadline: May 7 2018

[Conference Website >>](#)

[Call for Papers >>](#)

## **IEEE International Conference on MOOCs, Innovation & Technology in Education**

*International Cooperation in Engineering Education*

Paper submission deadline: June 15 2018

[Conference Website >>](#)

[Call for Papers >>](#)

## **IITEC International Symposium on Innovation & Technology**

Paper submission deadline: April 30 2018

[Conference Website >>](#)

[Call for Papers >>](#)

## **IAOE International Conference on Mobile Communication, Technologies & Learning**

*Mobile Technologies and Applications for the Internet of Things*

Paper submission deadline: June 1 2018

[Conference Website >>](#)

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## **Submit your Events and Calls for Papers**

If you would like us to share your conference details or call for papers, please send them to [k.hellal@ifees.net](mailto:k.hellal@ifees.net).

# RECOMMENDED MEDIA

## The Global State of the Art in Engineering Education

*Ruth Graham*

This report for the MIT School of Engineering is the culmination of a global two-year study on engineering education at the undergraduate level. For the study, Graham conducted interviews with 178 “individuals with in-depth knowledge and experience of world-leading engineering programs”. Participants distinguish between current and emerging leaders, provide their insight on constraints to the progress of engineering education and their thoughts of the field’s future.

Read Ruth Graham’s report [here](#).

## Global Expert Offers Insights on the Future of Engineering

*George Mason University*

Engineering students today should think broadly, honing their skills in communication, business, and global team building along with their math and technology expertise. They should search for industry internships early in their college years and plan on continuing to learn new skills throughout their careers. That is some of the advice IFEES Secretary General and GEDC Executive Secretary Hans Jürgen Hoyer gives in a recent interview with George Mason University, where he became resident scholar in global engineering this past January.

Click [here](#) or the full interview and learn more about the IFEES-GEDC Secretariat’s new home.

## 8 Guide Rails to Stay on Track when Communicating Change

*Monica Zimmer*

Monica Zimmer, an experienced communications professional, shares her eight key insights to more effectively communicate change. Click [here](#) to read the article.



## IGIP January Newsletter

*International Society for Engineering Pedagogy*

IGIP’s January issue is chock full of the organization’s achievements and initiatives in 2017. It also offers several brief columns of interest to the engineering education community, including designing inclusive engineering classrooms, written by Stephanie Farrell. The columns are an informative quick read.

Click [here](#) or the IGIP newsletter.

## Educating Engineers as Global Citizens

*John M. Grand*

In 2008, a group of 23 distinguished engineering educators convened in Newport, Rhode Island (USA) to discuss the globalization of U.S. engineering education. During ASEE’s 2018 Conference, a special panel session will reflect on the past decade and discuss the future of engineering education.

Click [here](#) to read the full report.

## IFEES/IIDEA Webinar Series



Watch IFEES’ latest webinar on industry and academia collaboration. Speakers include PJ Boardman from MathWorks and Xavier Fougere from Dassault Systèmes with an introduction by IFEES Vice President of Industry/Academia Relations. Click [here](#) to access the webinar.