THE INSTITUTION OF ENGINEERS, BANGLADESH

BOARD OF ACCREDITATION FOR ENGINEERING AND TECHNICAL EDUCATION

TRANSFORMING EDUCATION FOR THE INDUSTRY: ENGINEER'S PERSPECTIVE IN ACHIEVING VISION 2041

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DHAKA, BANGLADESH

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RUPOSHI BANGLA GRAND BALL ROOM, INTERCONTINENTAL HOTEL, DHAKA

PREAMBLE

The educators in engineering programs prepare their graduates for the industry. The industry in Bangladesh is advancing to make up for its grave post-independence deficits. The foreseen national growth per the national visions needs to be visible in the international arena.

Vision 2041 highlights the need for accelerated developments at higher altitudes with the local customization of high-end up-to-date engineering and technological know-how, which must trickle down into the profession as the fruits of Industry 4.0 and the upcoming Industry 5.0.

Engineers from all disciplines will be the prime movers. Our current graduates enhance their knowledge and skills through lifelong learning while the educators prepare our future graduates with up-to-date knowledge. The academic arena and the industry floors need to be under the same roof for the acquisition and delivery of knowledge and skills and their enhancement. A transformation in the teaching and learning process is on the horizon. Engineering graduates will display their learning in the industry at home and abroad consistently over time. In the future, our industry will have to recruit more high-grade professionals from our accredited engineering programs, which are well recognized at home and abroad. The local availability of capable engineers is an attractive ingredient for foreign direct investments (FDIs). The contribution to the national economy from enhanced FDIs is unfathomable. The international job markets will see our graduates as active contributors to the causes of the world. The country can expect to see them as high-income wage earners to enrich our foreign-currency reserves. The visibility in circularity in investment in engineering education is imminent.

All these accomplishments are rooted in an internationally recognized accreditation system for engineering education, which the Board of Accreditation for Engineering and Technical Education (BAETE) of the Institution of Engineers, Bangladesh has been pursuing since 2003 for the entire spectrum of engineering in Bangladesh. BAETE's accreditation criterion, the "Program Outcomes and Assessment," focuses on the industry's needs and describes the industry's most sought attributes in engineering graduates. The "Interaction with Industry" criterion focuses on how the students are exposed to the relevant industries. The "Program Educational Objectives" provide a means to monitor the graduates' development for up to 5 years after graduation.

BAETE's accreditation has led to the formation of industrial advisory panels in many engineering programs to bring the industry closer to academia. Our continuous effort is to bring them even closer together. As BAETE updates its requirements for graduates with the incorporation of sustainable development goals, we must start with the right footing. Our goal is to set a guiding path for the programs to be on the right course, and we need the industry's close collaboration to do that.

With this aim, we are organizing the first national symposium with the theme "Transforming Education for the Industry: Engineer's Perspective in Achieving Vision 2041" to bring faculty members and industry personnel under the same roof.

Transforming education for the Industry: Engineer's Perspective in Achieving Vision 2041-

Industry-Academia Interaction Model at United International University

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Professor, Dept. of Electrical and Electronic Engineering

United International University

Dhaka, Bangladesh

April 20, 2024 (Saturday)

Preamble

Engineering graduates of Bangladesh must play a major role in of transforming the country through sustainable development by balancing the growth with the integration of social and environmental impacts of economic activities. While the educators of engineering programs prepare the students for this paradigm shift, practicing engineers must enhance their knowledge and skills through lifelong learning. To match the changing needs of the industry, i.e., graduate attributes, an effective exchange of ideas and dialogue between the industry and academic is necessary. The quality of the graduates of more than four hundred engineering programs can be assured through benchmarking of the programs against a set standard. All these accomplishments are rooted in an internationally recognized accreditation system for engineering education, which the Board of Accreditation for Engineering and Technical Education (BAETE) of the Institution of Engineers, Bangladesh has been pursuing since 2003 for the entire spectrum of engineering in Bangladesh. BAETE's accreditation criterion, the "Program Outcomes and Assessment," focuses on the industry's needs and describes the industry's most sought attributes in engineering graduates. The "Interaction with Industry" criterion focuses on how the students are exposed to the relevant industries. The "Program Educational Objectives" provide a means to monitor the graduates' development for up to 5 years after graduation. BAETE's accreditation has led to the formation of industrial advisory panels in many engineering programs to bring the industry closer to academia. Our continuous effort is to bring them even closer together. As BAETE updates its requirements for graduates with the incorporation of sustainable development goals, we must start with the right footing. Our goal is to set a guiding path for the programs to be on the right course, and we need the industry's close collaboration to do that. With this aim, we are organizing this national symposium with the theme "Transforming Education for the Industry: Engineer's Perspective in Achieving Vision 2041" to bring faculty members and industry personnel under the same roof.

Basic understanding of Industry and Academia

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- Industry need
- Industry practice
- New idea/concept of business or product

- Academic requirements
- Curriculum design
- Internship

Bridging between Industry and academia

- Training before joining
- Modality of training
- New idea/concept of training
- Associated research of product development for the industry

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Industry perspective

- Industry need - this is governed by the stakeholder choice or need
- Industry practice – launch a product or service asap to penetrate into the market at first
    - Risk, profit, leadership in the market etc.
- New idea/concept of business or product – for sustainable development, industry always hunts for new business or product

Tesla - an example of new concept, stakeholder need, cutting edge technology, new business model etc.

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Industry perspective (Contd.)

- Expert working group in a specific domain to move forward the business
- Examples:
  - Power plant investors always hunt for expert (!) fresh graduates
  - Data science industries hunt for ML and AI experts (!)

Subject matter oriented curriculum design could be a path towards the solution to address the issues

Academia perspective

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- Academic requirements - a cohort will not work in the same industry
- Curriculum design- it has to be designed with breath and depth of knowledge of the program
- Risk- it may not fully depend on the industry's vision or its pathway.

  Example- communication engineering has little prospect now in Bangladesh.
- Reduce the stress on pen & paper based assessment, with more real life hands on assessment
- Internship- a flavor of industry during student life

Industry required Intensive training could be the solution to address the issues

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Bridging between Industry and academia

- Involvement of Industry experts in curriculum design
- Discuss the cutting edge technology in the classroom study- example United Power
- Research idea/ outcomes shared by the academia
- Research theme / proposal shared from the industry side- example Niagara Textile, Neural Semiconductor and others.
- Resolve issues of the industries by the academia- example United Power
- Associated research of product development for the industry
- Industry visit, Training, attachment and internship

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Bridging between Industry and academia (contd.)

Training- the best way for skilled human resource production

- Training before/after joining in the industry
- Modality of training
    i. Intensive
    ii. Extensive
- New idea/concept of training

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Training example @ UIU

Training- VLSI training, a chip design technique for integrated circuit design

tsmc

Qualcomm

AMD

intel

TOSHIBA

……And many more

- It requires licensed software, which is pretty much expensive
- At least a trainer is required for trainee(s)

- Academia has the facility/ logistic support to train

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Training example @ UIU (contd.)

- Industry has invested to the academic institutions for training
- Trainer and course materials have been selected by the industry
- Trainee will give the training fee
- After successful training and entrance to the job, trainee will get back the training fee (industry investment)- seems industry expenses the amount to train the fresh recruited person
- If the trainee does not get any job, his/her fee will not be returned

So far 28+29 trainee has been trained, under 2 batches

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Thank you all

SHORT BIO OF PROFESSOR INTEKHAB ALAM

Professor Intekhab Alam, an accomplished Electrical and Electronic Engineer, boasts over 14 years of experience in education. Renowned for his teaching prowess, he also excels in curriculum development, having spearheaded accreditation efforts for United International University's Electrical and Electronic Engineering program. With a PhD in optical devices, his expertise spans power systems as well. Holding academic credentials from Kyushu University, Ritsumeikan University, and Bangladesh University of Engineering and Technology (BUET), he brings valuable industry insights from roles at United Ashuganj Energy Limited and Niagara Textile. Professor Alam's dedication to renewable energy is evident in projects like solar nano grids and solar-powered boats, showcasing his commitment to sustainability. His leadership extends to consulting roles in the power sector, underlining his capacity to innovate and drive change.

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