THE INSTITUTION OF ENGINEERS, BANGLADESH

BOARD OF ACCREDITATION FOR ENGINEERING AND TECHNICAL EDUCATION

INTERNATIONAL SYMPOSIUM ON

QUALITY ASSURANCE IN ENGINEERING EDUCATION THROUGH ACCREDITATION-III

DATE: **11-12** May 2023

VENUE: Radisson Blue Water Garden Hotel
Dhaka, Bangladesh

IEB and BAETE

The Institution of Engineers, Bangladesh (IEB) was founded as The Institute of Engineers, Pakistan, which was registered on 7 May 1948, by the Registrar of Joint Stock Companies, East Bengal. It was recognized as the representative body of qualified engineers when its constitution was ratified by the government of what was then Pakistan in September 1952. After Bangladesh emerged as an independent country in 1971, the society's name was changed from The Institute of Engineers, Pakistan, to The Institution of Engineers, Bangladesh. The new organization was registered by the Registrar of Joint Stock Companies, Government of the People's Republic of Bangladesh, in July 1972.

To become a member of IEB and provide professional services in Bangladesh, an individual must hold an engineering degree recognized by IEB. Additionally, IEB oversees the growth and quality of engineering education in Bangladesh. To this end, the IEB constitution encompasses the accreditation of programs within the country that award engineering degrees.

The Board of Accreditation for Engineering and Technical Education (BAETE) was established by IEB in accordance with provision enshrined in IEB constitution. BAETE, thereafter, referred to as "The Board", is empowered to function as an independent and autonomous body to establish the policy, procedure, criteria, and related systems to conduct engineering program accreditation.

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Print: Progressive Printers Private Limited

BACKGROUND

Bangladesh boasts to be the fastest developing economy in South Asia. Major elements of civilization that Bangladesh needs to possess to gear this progress are being identified and constructed. Achieving excellence in new developments can reduce the cost of redevelopments at the end of the lifecycle and hence make the entire process more sustainable. Apart from the monetary benefits, this will also utilize resources efficiently, fight with climate change challenges and be in line with the UNSDG goals. Engineers must play their roles in making progress towards these goals. The engineers of the near future need to demonstrate the capacity to develop solutions for problems with enormous complexities not only in environmental and economic contexts but also in the societal context. To achieve this, our engineering education system will need further transformation. This will equip our engineers with the required attributes in the job market, both at home and abroad.

OBJECTIVES AND **ORGANIZATION**

The upcoming symposium focuses on discussing how our engineering education curriculum embraces the challenges of SDG goals, how to better address the issues and how to fill up the gaps. International Engineering Alliance has introduced new graduate attributes keeping the attainment of professional competencies as the far-reaching vision. The accreditation system will also therefore see a departure in the coming era. We wish to discuss all in depth with you in the contexts of past, present and future scenarios so that we can achieve a smoother transition, a pathway, which is a necessity for making progress toward our national and global goals.

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PUBLIC UNIVERSITIES OFFERING ENGINEERING PROGRAMS

1. Bangabandhu Sheikh Mujibur Rahman Aviation And Aerospace University
2. Bangabandhu Sheikh Mujibur Rahman Digital University
3. Bangabandhu Sheikh Mujibur Rahman Maritime University
4. Bangabandhu Sheikh Mujibur Rahman Science & Technology University
5. Bangabandhu Sheikh Mujibur Rahman Science & Technology University, Pirojpur
6. Bangabandhu Sheikh Mujibur Rahman University, Kishoreganj
7. Bangamata Sheikh Fojilatunnesa Mujib Science and Technology University
8. Bangladesh Agricultural University
9. Bangladesh Open University
10. Bangladesh University of Engineering & Technology
11. Bangladesh University of Professionals
12. Bangladesh University of Textiles
13. Begum Rokeya University, Rangpur
14. Chittagong University of Engineering & Technology
15. Chittagong Veterinary and Animal Sciences University
16. Comilla University
17. Dhaka University of Engineering & Technology
18. Hajee Mohammad Danesh Science & Technology University
19. Islamic University
20. Jagannath University
21. Jahangirnagar University
22. Jatiya Kabi Kazi Nazrul Islam University
23. Jessore University of Science & Technology
24. Khulna Agricultural University
25. Khulna University
26. Khulna University of Engineering & Technology
27. Mawlana Bhashani Science & Technology University
28. Noakhali Science & Technology University
29. Pabna University of Science and Technology
30. Patuakhali Science And Technology University
31. Rajshahi University of Engineering & Technology
32. Rangamati Science and Technology University
33. Shahjalal University of Science & Technology
34. Sheikh Hasina University
35. Sylhet Agricultural University
36. University of Barishal
37. University of Chittagong
38. University of Dhaka
39. University of Rajshahi

PRIVATE UNIVERSITIES OFFERING ENGINEERING PROGRAMS

1. Ahsanullah University of Science and Technology
2. American International University-Bangladesh
3. Anwer Khan Modern University
4. Asian University of Bangladesh
5. Atish Dipankar University of Science & Technology
6. Bangladesh Army International University of Science & Technology, Comilla
7. Bangladesh Army University of Engineering and Technology, Qadirabad
8. Bangladesh Army University of Science and Technology, Saidpur
9. Bangladesh University
10. Bangladesh University of Business & Technology
11. Bangladesh University of Health Sciences
12. BGC Trust University Bangladesh
13. BGMEA University of Fashion & Technology
14. BRAC University
15. Britannia University
16. Canadian University of Bangladesh
17. CCN University of Science & Technology
18. Central University of Science and Technology
19. Central Women's University
20. Chattogram BGMEA University of Fashion and Technology
21. Chittagong Independent University
22. City University
23. Cox's Bazar International University
24. Daffodil International University
25. Dhaka International University
26. East Delta University

List of Private University continued .....

27. East West University
28. Eastern University
29. European University of Bangladesh
30. Exim Bank Agricultural University
31. Fareast International University
32. Feni University
33. First Capital University of Bangladesh
34. German University Bangladesh
35. Global University Bangladesh
36. Gono Bishwabidyalay
37. Green University of Bangladesh
38. Hamdard University Bangladesh
39. IBAIS University
40. Independent University, Bangladesh
41. International Islamic University Chittagong
42. International Standard University
43. International University of Business Agriculture & Technology
44. Khulna Khan Bahadur Ahsanullah University
45. Khwaja Yunus Ali University
46. Leading University
47. Manarat International University
48. Metropolitan University
49. N. P. I. University of Bangladesh
50. North Bengal International University
51. North East University Bangladesh
52. North South University
53. North Western University
54. Northern University Bangladesh
55. Northern University of Business & Technology, Khulna
56. Notre Dame University Bangladesh
57. Port City International University
58. Premier University
59. Presidency University
60. Prime University
61. Primeasia University
62. Pundra University of Science & Technology
63. Queens University
64. R. P. Shaha University
65. R. T. M. Al-Kabir Technical University
66. Rabindra Maitree University, Kushtia
67. Rajshahi Science & Technology University, Natore
68. Royal University of Dhaka
69. Shanto-Mariam University of Creative Technology
70. Sheikh Fazilatunnesa Mujib University
71. Sonargaon University
72. Southeast University
73. Southern University Bangladesh
74. Stamford University Bangladesh
75. State University of Bangladesh
76. Sylhet International University
77. The International University of Scholars
78. The Millennium University
79. The People's University of Bangladesh
80. Trust University, Barishal
81. United International University
82. University of Asia Pacific
83. University of Brahmanbaria
84. University of Creative Technology, Chittagong
85. University of Development Alternative
86. University of Global Village
87. University of Information Technology & Sciences
88. University of Liberal Arts Bangladesh
89. University of Science & Technology Chittagong
90. University of Skill Enrichment and Technology
91. University of South Asia
92. Uttara University
93. Varendra University
94. Victoria University of Bangladesh
95. World University of Bangladesh
96. Z. H. Sikder University of Science & Technology
97. ZNRF University of Management Sciences

INTERNATIONAL UNIVERSITY OFFERING ENGINEERING PROGRAMS

1. Islamic University of Technology, Gazipur

ACTIVITIES AND INTERACTIONS
OF BAETE IN NATIONAL AND INTERNATIONAL ARENA (2016 – 2023)

2023

9th Accreditation Decision Meeting Virtually Observed by Verification Review Team of International Engineering Alliance, 12 February 2023

World Engineers Day Celebration at Sydney, Australia, 4 March 2023

2022

Hands-on Orientation for New Program Evaluators, 13 May 2022

Hands-on Orientation for New Program Evaluators, 14 May 2022

2022

Hands-on Orientation for New Program Evaluators, 27 May 2022

Hands-on Orientation for New Program Evaluators, 28 May 2022

2022



Interaction Session with the BAETE Program Evaluators, 11 September 2022


Interaction Session with the BAETE Program Evaluators, 12 September 2022


Interaction Session with the BAETE Program Evaluators, 14 September 2022

2022

Hands-on Orientation for New Program Evaluators, 28 October 2022

Hands-on Orientation for New Program Evaluators, 29 October 2022

2022

Orientation and Discussion Sessions for Program Evaluators from Industry, 21 October 2022

Orientation and Discussion Sessions for Program Evaluators from Industry, 22 October 2022

2022

Interaction Session with the BAETE Program Evaluators, 12 November 2022

Re-training of BAETE Program Evaluators on Accreditation Manual for Undergraduate Engineering Programs Version 2.1, 3 December 2022

2021

8-11 February 2021

8-11 March 2021

Interaction Session with the BAETE Program Evaluators, 13 August 2021

Interaction Session with the BAETE Program Evaluators, 20 August 2021

2020

International Symposium-II, 26-27 August 2020

2019

Interactions Across the Sectors, March - October 2019

International Symposium-I, 13-14 March 2019

2019

International Symposium-I, 13-14 March 2019

2019

Hands-on Orientation Session on OBE, 18 June 2019

Interaction Session with the BAETE Program Evaluators, 18-19 June 2019

2019

International Engineering Alliance Meeting, Hongkong, 18 June 2019

Orientation and Discussion Session for Assessing, Drafting and Finalizing On-site Program Evaluations, 5 August 2019

2019

Orientation and Discussion Session for Assessing, Drafting and Finalizing On-site Program Evaluations, 5 August 2019

Hands-on Orientation Session for New Program Evaluators (Group A), 18 June 2019

2019

Hands-on Orientation Session for New Program Evaluators (Group B), 19 June 2019

Hands-on Orientation Session for OBE, 8 October 2019

2019


Hands-on Orientation Session for OBE, 8 October 2019




Orientation and Discussion Session for Program Evaluators from Industry, 7 October 2019

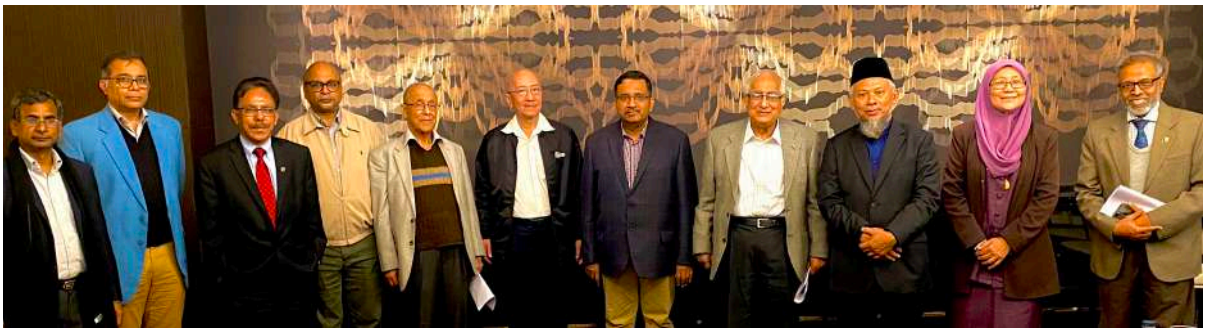

ABET Visit to Northeastern University as Observer from BAETE, 3-5 November 2019

2019

ABET Visit to Northeastern University as Observer from BAETE, 3-5 November 2019

2019

Visit to ABET, 6 November 2019



64th Board Meeting, 21 December 2019

2019


BAETE Received Mentors from Board of Engineers, Malaysia and The Institution of Engineers, Singapore, January - December 2019





National Level Workshops, Experience Sharing Sessions and Intensive Training of Program Evaluators, January - December 2019

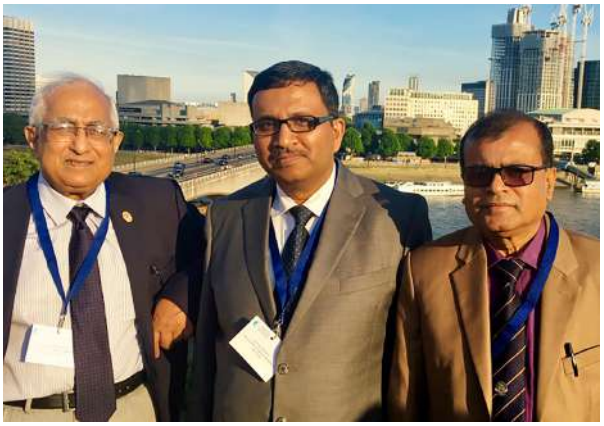
2019






National Level Workshops, Experience Sharing Sessions and Intensive Training of program evaluators, January - December 2019

2018

International Engineering Alliance Meeting 2018 at London, UK

2018

BAETE Received Mentors from Board of Engineers, Malaysia and The Institution of Engineers, Singapore, January - December 2018

2018

BAETE Conducted Customized On-site Trainings for Programs all over Bangladesh, January - December 2018

2018

BAETE Conducted Customized On-site Trainings for Programs all over Bangladesh, January - December 2018

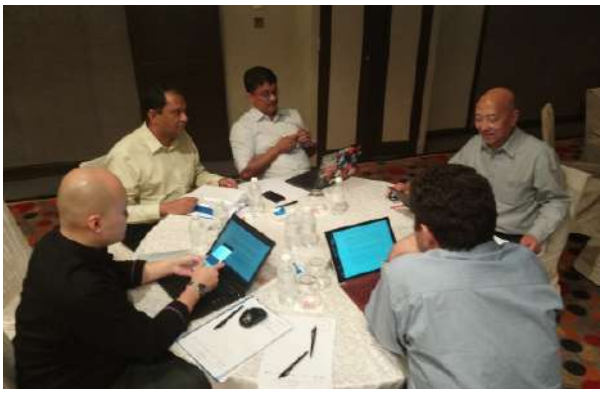
2017

International Engineering Alliance Meeting 2017 at Anchorage, USA

BAETE Received Mentors from Board of Engineers, Malaysia and The Institution of Engineers, Singapore, January - December 2017

BAETE was Observer to the Accreditation Procedures in Malaysia and Singapore, May - December 2017

2017



BAETE was Observer to the Accreditation Procedures in Malaysia and Singapore, May - December 2017

2016

BAETE Received Mentors from Board of Engineers, Malaysia and The Institution of Engineers, Singapore, September 2016

National Level Workshops, Experience Sharing Sessions and Intensive Training of Program Evaluators, September 2016

2016






Intensive Grooming Sessions for OBE Educators by Board of Engineers, Malaysia Mentors in a Retreat Visit Outside Dhaka, December 2016

2016

International Engineering Alliance Meeting 2016 at Kuala Lumpur, Malaysia

PROGRAM **AT A GLANCE**

DAY 1: 11 MAY 2023, THURSDAY

09:30 AM – 10:30 AM	Registration, Tea and Socialization
10:30 AM – 01:15 PM	Session 1
01:15 PM – 02:15 PM	Lunch Break
02:15 PM – 03:00 PM	Continuation of Session 1
03:00 PM – 04:00 PM	Opening Ceremony
04:00 PM – 04:30 PM	Tea Break
04:30 PM – 06:30 PM	Session 2
06:30 PM – 07:00 PM	Break
07:00 PM—08:30 PM	Dinner

DAY 2: 12 MAY 2023, FRIDAY

09:30 AM – 11:00 AM	Session 3
11:00 AM – 11:30 AM	Tea Break
11:30 AM – 12:00 PM	Continuation of Session 3
12:00 PM – 02:30 PM	Lunch Break
02:30 PM – 05:30 PM	Session 4
05:30 PM – 06:15 PM	Closing Ceremony
06:15 PM - 06:45 PM	Tea and Socialization

DETAILS OF **THE SESSIONS**

Day-1: 11 May 2023, Thursday

SESSION-I: Engineering Education for Sustainable Development

Chair: Em Prof. Elizabeth Taylor
Chair, Washington Accord, International Engineering Alliance

Keynote Talk 01:
Strengthening the structure of engineering education in line with SDGs
Prof. Dato Ir. Dr. Wan Hamidon Wan Badaruzzaman

Keynote Talk 02:
Global alliance in education and professional practices for sustainable development
Prof. Kai Sang Lock

Keynote Talk 03:
Addressing SDG in the culminating courses
Prof. Siti Hawa Hamzah

Keynote Talk 04:
A glance at GAPC from both sides of the table
Prof. Arif Bülent Özgüler

SESSION-II: Development Perspectives of Bangladesh

Chair: Prof. Kai Sang Lock
Deputy Chair, Washington Accord, International Engineering Alliance

Plenary Talk 1:
Graduate engineers' attributes for sustainable development: pathway set by the accreditation board
Prof. AFM Saiful Amin with Prof. Kazi Bayzid Kabir

Plenary Talk 2:
Future focused engineering education, accreditation and mobility: supporting national development
Em Prof. Elizabeth Taylor

Day-2: 12 May 2023, Friday

SESSION-III: Workshop-I on the Draft of BAETE Accreditation Manual Version 3.0

Chair: Prof. Dato Ir. Dr. Wan Hamidon Wan Badaruzzaman
Chairman, Smart and Sustainable Township Research Centre, Universiti Kebangsaan Malayasia

Keynote Talk 05:
BAETE Manual Version 3 [Draft]: Introducing GAPC V4 – a pathway for sustainable transformation
Prof. M. Sohel Rahman with Prof. Arshad M. Chowdhury

Open Discussion on BAETE Manual Version 3.0 [Draft]

Keynote Talk 06:
Incorporation of SDGs into engineering education in Bangladesh
Prof. Kazi Bayzid Kabir

SESSION-IV: Workshop-II on Best Practices in Accreditation

Chair: Prof. Siti Hawa Hamza
Vice President, The Institution of Engineers, Malaysia

Keynote Talk 07:
Learning from our international community
Em. Prof. Elizabeth Taylor

Keynote Talk 08:
Educating the sustainability engineers of the future
Dr. Mandy Liu

Keynote Talk 09:
Best practices in evaluation for accreditation of programs - BAETE perspectives
Prof. Anisul Haque

Keynote Talk 10:
BAETE accreditation preparation - program's perspective
Prof. Salekul Islam

PLENARY TALKS

PLENARY TALK 1

GRADUATE ENGINEERS' ATTRIBUTES FOR SUSTAINABLE DEVELOPMENT: PATHWAY SET BY THE ACCREDITATION BOARD

Prof. AFM Saiful Amin
Acting Chairman and Vice Chairman-1
Board of Accreditation for Engineering and Technical Education

Prof. Kazi Bayzid Kabir
Member Secretary
Board of Accreditation for Engineering and Technical Education

ABSTRACT

Bangladesh is one of the booming economies of Asia, steadily driving with a strong growth in GDP. The country is on track to be removed from the UN's list of least developed countries in 2026. By maintaining a steady growth rate, Vision 2041 of Bangladesh strives to eradicate extreme poverty and gain upper-middle-income country status by 2030 and high-income country status by 2041. This transition requires a large number of engineers to meet emerging development needs. The country's need for engineering professionals is overwhelmingly met by local engineers. Also, engineers from Bangladesh are employed in the U.S., Europe, Australia, England and in the Middle East. The need for engineers is a driving factor in the recent expansion of engineering programs at the tertiary level.

The Board of Accreditation for Engineering and Technical Education (BAETE), an independent organization under the Institution of Engineers, Bangladesh is currently benchmarking engineering programs within the geographical area of Bangladesh, per the graduate attributes set by the International Engineering Alliance (IEA). The IEA is further working with the signatory countries to set a pathway to incorporate the UN SDG goals within a set of realigned graduate attributes. Realizing the desired professional competencies is important to reach the goal. The new changes encourage institutions of higher education to realign their programs with national and global goals.

Our discussion is focused on how engineering programs should make this transition and how it is likely to change certain aspects of the curriculum, teaching, learning and assessment.

Saiful Amin has been with BAETE since its first few visits conducted in input-based accreditation system about two decades ago. He is a leading proponent and promoter of engineering education and the development of sustainable infrastructure in Bangladesh. Prof. Saiful Amin worked for BAETE in inking the first OBE Manual in 2016 and implemented it in 2017 across the country. The manual went through subsequent revisions with his close supervision in subsequent years. He was the member secretary of BAETE 2016–2020 when it pursued major capacity building for OBE. Prof. Amin is now the first vice chairman and acting chairman of BAETE. He was responsible for guiding BAETE through the challenges of the COVID-19 era, introducing digitization and hybrid modes of communication in the processes of the board at the very onset of COVID-19, which eased day-to-day activities and maintained nationwide operations and international activities for capacity building.

Born and raised in Bangladesh in a research, education and engineering-centered middle-class family, he was awarded with a Government of Japan fellowship and several German fellowships/grants for his doctoral and post-doctoral studies, respectively. As an experienced civil engineer and leading engineering researcher, he has been teaching and researching as well as designing, constructing, repairing, and maintaining major installations for over 25 years as an advisor and consultant in Bangladesh. Apart from his professorship in Department of Civil Engineering of BUET, currently, he holds the Director position at the Institute for Disaster Prevention and Urban Safety of BUET, focused on research of disaster management and disaster risk reduction to create a more skilled workforce. He is the chair of the Bangladesh Group of International Association for Bridge and Structural Engineering (IABSE) and also the founding member of the IABSE Academy responsible for e-learning initiatives in bridge and structural engineering. He is the Institution of Civil Engineers United Kingdom representative in Bangladesh.

Prof. Saiful Amin was honored with a gold medal from Prime Minister Sheikh Hasina in 1996 and is an F. R. Khan scholar, recipient of several merit scholarships in Bangladesh and several distinctions from Europe, Asia and the Far East.

Prof. Amin is a fellow of The Institution of Engineers, Bangladesh; Institution of Civil Engineers, United Kingdom and International Association for Bridge and Structural Engineering.

Kazi Bayzid Kabir is a Professor of Chemical Engineering at Bangladesh University of Engineering and Technology (BUET). Dr. Kabir completed his PhD from Monash University in 2014. Before that, he completed his MSc in Chemical Engineering in 2009 and BSc in Chemical Engineering in 2004 from BUET.

Dr. Kabir has been involved in energy research with emphasis on solid fuel conversion (pyrolysis and gasification), syngas conversion to liquid and gaseous fuels via heterogeneous catalysis, waste-to-energy through hydrothermal treatment, and life-cycle assessment and techno-economic assessment of energy conversion processes. Apart from teaching and research, Dr. Kabir also has keen interest in academic quality assurance. He is currently the Additional Director of BUET's Institutional Quality Assurance Cell and works closely with the Strategic Planning and Quality Assurance Division of UGC. Dr. Kabir is also the Member Secretary of the Board of Accreditation for Engineering and Technical Education since March 2021.

Prof. Kabir is a Life Member of The Institution of Engineers, Bangladesh, as well as Senior Member of the American Institute of Chemical Engineers and Associate Member of the Institution of Chemical Engineers.

PLENARY TALK 2

FUTURE FOCUSED ENGINEERING EDUCATION, ACCREDITATION AND MOBILITY: SUPPORTING NATIONAL DEVELOPMENT

Em Prof. Elizabeth Taylor
Chair, Washington Accord, International Engineering Alliance

ABSTRACT

The Bangladesh engineering profession has had a major role in Bangladesh national development. The World Bank notes Bangladesh has moved from one of the poorest nations at birth to now one of the fastest-growing economies. While celebrating such success, the UN Sustainable Development Goals (SDG) remind us of the significant challenges that lie ahead. The capacity of engineering to meet those challenges will be tested so it will imperative we evolve our profession, recognising our strengths but also accepting our weaknesses and learning from them. Past engineering brought great progress (for some). It did so without accounting for environmental impact, the finiteness of resources and the health, welfare and safety of all humanity. These, and perhaps other issues still emerging, will frame the future. So, in meeting the SDG challenges, we engineers must develop decision tools that avoid creating a future that is a linear extension of poverty, inequality, climate, and environmental degradation, borne heavily and inequitably across the world. This presentation will explore future focused engineering education, accreditation and mobility ideas that seek to build an engineering profession designed to drive a better future for all.

Elizabeth Taylor specialises in governance effectiveness and analysis of complex projects and ecosystems.

Her career has spanned industry, design and construction, and academe. Since 2013 she has focused on analysis of complex engineering projects. Elizabeth has built extensive Board-level leadership in professional organisations and innovative technology entities. Currently she is Chair of SmartCrete Collaborative Research Centre (focused on concrete) and Chair, Washington Accord, and Deputy Chair, Governing Group, of the International Engineering Alliance.

Elizabeth has always engaged in diverse pro-bono work. Currently she is Chair of the Cambodian Childrens' Trust Australia. Previously she was Chair of RedR Australia, an humanitarian response agency, and Chair of RedR International.

Elizabeth is an Officer of the Order of Australia, an Honorary Fellow of Engineers Australia, Fellow of the Australian Institute of Company Directors, Fellow, Academy of Technological Sciences and Engineering and has been recognised as one of Australia's 100 most influential engineers. In 2021 she was awarded Engineers Australia's Peter Nicol Russell Career Achievement Memorial Medal.

KEYNOTE TALKS

KEYNOTE TALK 1

STRENGTHENING THE STRUCTURE OF ENGINEERING EDUCATION IN LINE WITH SDGS

Prof. Dato Ir. Dr. Wan Hamidon Wan Badaruzzaman
Chairman, Smart and Sustainable Township Research Centre, Universiti Kebangsaan Malayasia

ABSTRACT

Recently, the International Engineering Alliance has explicitly introduced Sustainable Development Goals (SDG) in the Graduate Attributes or Programme Outcomes of engineering graduates produced by the signatories of the Washington, Sydney and Dublin Accords. This requirement needs serious thinking to migrate all engineering programmes that were to be accredited by the signatories to include the SDG components and conditions in the academic curriculum. Every one of the goals of the SDG is likely linked to science, engineering and technology. The Malaysian Council of Engineering Deans provides a platform to help build knowledge, experience and appropriate approaches to enhance the technical capacity of engineers in order to adapt engineering-related infrastructures to SDGs. The standard of engineering education must be correct for nation-building; hence, developing and implementing solutions involving SDG in the academic curriculum with the right approach is necessary. This paper's objective is to share the MCED experience in approaching the way forward towards the adoption of the requirement of the inclusion of the SDG explicitly in the academic curriculum. The sharing includes the planning, timeline, and possible approaches to reach the set goals. It is hoped that the sharing will benefit participants attending this symposium.

Dato' Wan is a Professor of Structural Engineering. He wasthe former Dean of the Faculty of Engineering and Built Environment, Universiti Kebangsaan Malaysia and the formerMalaysian Council for Engineering Deans (MCED) Chairman. He was the Director of the Engineering Accreditation Department, Board of Engineers Malaysia (BEM) (2014 – 2016) and is currently a member of the BEM's Engineering Accreditation Council (EAC). He is currently one of the Washington Accord mentors for BAETE.

He has been appointed to various positions and committees under the BEM that has helped uphold and enhance the high standard of engineering and technology education in Malaysia. He played a significant role in facilitating the transformation of engineering education in Malaysia. He was the Chairman of the Working Group that drafted the first-everBoard of Engineers Malaysia (BEM)'s Manual for Accreditation of Engineering Programmes based on OBE launched in 2006. He was heavily involved in the processes that made Malaysia accepted as a full signatory of the Washington, Sydney and Dublin Accords.

He has patented an Industrialised Building System (IBS) known as the 'Profiled Steel Sheeting Dry Board (PSSDB)System' and has published more than 300 papers/publications. He has won various research products awards: Winner of the Malaysian Construction Industry Development Board (CIDB)Construction Innovation and Design Award (2001); Gold Medal for 26th International Exhibition of Inventions, Geneva, Switzerland (1998); Malaysian National Inventor's Award, MOSTE (1998); and Gold Medal for the World Intellectual Property (WIPO) Best Overall Invention, MINDEX/INNOTEX Design & Invention Exhibition (1997).

KEYNOTE TALK 2

GLOBAL ALLIANCE IN EDUCATION AND PROFESSIONAL PRACTICES FOR SUSTAINABLE DEVELOPMENT

Prof. Kai Sang Lock
Professor (Engineering), Singapore Institute of Technology
Deputy Chair, Washington Accord
Past President & Past Chairman of Engineering Accreditation Board, Institution of Engineers, Singapore

ABSTRACT

Sustainable development is a global challenge that requires collective action and collaboration across sectors and regions. To achieve sustainable development, it is crucial to build global alliances in education and professional practices to facilitate the sharing of knowledge and best practices, build capacity, foster collaboration across sectors, develop common standards and guidelines, promote innovation, and address global challenges. Engineering education has to reshape curriculum and practice to develop green skills which encompass the knowledge, abilities, and competencies required to operate in a green economy.

Lock is the Deputy Chair of the Washington Accord. He is a Professor (Engineering) at the Singapore Institute of Technology (SIT), the 5th government-funded university in Singapore. He is an Emeritus President of the Institution of Engineers Singapore (IES). He served as Chairman of the Engineering Accreditation Board, IES, from 2002 to 2009, leading IES to become a signatory of the Washington Accord in 2006. He successfully mentored the engineering accreditation board in India and Pakistan to gain full-signatory status in Washington Accord. He served as Washington Accord review team member and team chair for review visits to South Africa, South Korea, USA, China and UK. He is currently a WA mentor for BAETE.

Professor Lock has a unique blend of practicing and academic experience acquired through a career which is equally split between the industry and the academia. He is a registered Professional Engineer (Electrical) and has served as a Board Member of the Professional Engineers Board, Singapore for 14 years. He is a Fellow of Academy of Engineering Singapore, an Honorary Fellow of the Institution of Engineers, Singapore and an Honorary Fellow of the ASEAN Federation of Engineering Organizations. He received both his B.Sc. (1975) and Ph.D. (1979) degrees in Electrical Engineering from the University of Strathclyde, UK. He was a faculty at the Department of Electrical Engineering, National University of Singapore for 17 years when he left to set up his consulting practice in 1997. He returned to the academia as a professor in 2016 after 20 years in the industry. He is the co-Laureate of the 2021 WFEO Medal for Excellence in Engineering Education awarded by the World Federation of Engineering Organisations.

KEYNOTE TALK 3

ADDRESSING SDG IN THE CULMINATING COURSES

Prof. Siti Hawa Hamzah
Vice President, Institution of Engineers, Malaysia.

ABSTRACT

The accrediting bodies for engineering qualifications use outcomes based criteria for evaluating the programmes. The recent revision to the graduate attributes and professional competence (GAPC v4 2021), reflect requirements for new technologies and values such as sustainable development, diversity and inclusion, and ethics. Constructive alignment to address the SDG, WK, WP and EA are shown in the culminating courses. At the end of this presentation, educators should be able to design the teaching plan, learning outcomes and assessment evidences; simultaneously addressing the SDG.

Siti Hawa Hamzah is a retired Professor in Civil and Structural Engineering from UiTM Shah Alam (1983-2017); the former Director of the Engineering Accreditation Department, BEM (2020-2022); and was the EAC Associate Director (2014 – 2020). Currently, she is the Vice President with IEM (2023-2025), an IEM Fellow since 2006, completed serving as an ordinary council member (2021-2023), and had served as council and excomm in sessions 2001 until 2004. She specializes in load bearing wall panel structures and engineering education. She has been providing extensive trainings on OBE and engineering education. She made impactful contributions in Malaysia, Afghanistan, Bangladesh and Qatar on OBE and quality assurance; and affiliated with the International Engineering Alliance, as a mentor to BAETE-IEB and a reviewer to HKIE. Her awards include the Hon. Distinguished Fellow SEEM, Hon. MAFEO, IEM Woman Engineer and more than 20 research accolades. Her recent recognition is through the Who's Who in Engineering Malaysia, 2022. Ir. Dr. Siti published 15 books in structural engineering and more than 175 technical papers. To date, she had examined more than 65 P.Eng candidates. She holds bachelor and master degrees in civil engineering; and certificate of education from the USA. She completed her PhD in Civil and Structural Engineering from UKM. She's a PEPC, FIEM, APM, MRM and PSWM.

KEYNOTE TALK 4

A GLANCE AT GAPC FROM BOTH SIDES OF THE TABLE

Prof. Arif Bülent Özgüler
Bilkent University, Ankara

ABSTRACT

IEA Graduate Attributes primarily concern first, the engineering programs at higher education institutions and second, the evaluators at engineering accreditation organizations. The immediate task for programs is implementation of the attributes into their engineering curriculum whereas accreditors' task is to have a clear mind as to what evidence to look for. Programs must demonstrate adequately and accreditors must evaluate candidly. The burden of proof is on HEIs and accreditors have the responsibility to carry out an equitable evaluation.

This talk aims to provide helpful clues to both parties. The suggested clues are based on a classification of attributes into hard-soft and the required cognitive student skills into knowledge-awareness. Renewed emphasis in the revised IEA-GAPC may be expressed by the keywords: Sustainable Development Goals, creativity, continuous development, broader view, diversity/inclusion, digitization, and automation. This talk indicates how each of these are incorporated in the "knowledge profile" as well as in the "graduate attributes profile." Through specific examples, hints for implementation in an engineering four-year curriculum are given and what may count as evidence for attainment of attributes in student works are offered.

Arif Bülent Özgüler has been with the Electrical and Electronics Engineering Department of Bilkent University, Ankara, since 1986. Professor Özgüler's research interests are in the areas of control theory, game theory, and application of system theory to social sciences. Professor Özgüler is a founding member of MÜDEK (Association for Evaluation and Accreditation of Engineering Programs, Türkiye). He has served as Vice Chair of the Executive Board of MÜDEK in 2007-2010 and as Chair of MAK (Engineering Programs Accreditation Board) of MÜDEK in 2017-2018. Presently he is a member of the Advisory Board of MÜDEK. He is a member-at-large representative for Washington Accord in the Governing Group of International Engineering Alliance.

KEYNOTE TALK 5

BAETE MANUAL VERSION 3.0 [DRAFT]: INTRODUCING GAPC V4 – A PATHWAY FOR SUSTAINABLE TRANSFORMATION

Prof. M. Sohel Rahman
Chair, Taskforce for Manual Preparation, BAETE

Prof. Arshad M. Chowdhury
Member, Taskforce for Manual Preparation, BAETE

ABSTRACT

As part of its own continuous quality improvement process, Board of Accreditation for Engineering and Technical Education continually endeavours to improve its own manual. And the recent revision of Graduate Attributes and Professional Competencies (GAPC) by the International Engineering Alliance (IEA) demanded a major overhaul therein and prompted the formation of a taskforce entrusted for this task. This resulted in the Version 3.0 of BAETE manual, currently in the draft stage and referred to as V3.0 henceforth, which also incorporates some other major changes along different dimensions. In this talk, we will be presenting the salient features of V3.0 highlighting the major changes along with the rational thereof and will be expecting constructive feedback through lively engagement of the audience and the stakeholders present both online and in-person.

M. Sohel Rahman is a Professor of the CSE department of BUET. He is a Distinguished Member of the ACM, a Distinguished Contributor of IEEE Computer Society and a Senior Member of IEEE. He is also a Peer-review College Member of EPSRC, UK. He is a Fellow of Bangladesh Academy of Sciences. He currently holds the Distinguished Speakership of both ACM and IEEE CS.

He received different scholarships and fellowships including Commonwealth Scholarship, Commonwealth Fellowship, ACU Titular Fellowship, University College London-Big Data Institute visiting grant, London Mathematical Society Visiting Grant etc. He is also a recipient of the Bangladesh Academy of Sciences Gold Medal and UGC Award. He has led research and development projects funded by the British Council, UGC-World Bank, ICT Division, Government of Bangladesh and BUET.

Dr. Rahman is an Academic Editor of PLOS One, Associate Editor of BMC Research Notes and guest editor in Theoretical Computer Science, Journal of Graph Algorithms and Applications, Journal of Discrete Algorithms, Fundamenta Informaticae etc. He has also served as Program Committee members in a number of conference series' of international repute. He regularly writes reviews at Mathematical Review and ACM Computing Review.

Prof. Rahman is deeply involved with the accreditation of engineering and computing education. He chairs the sectoral committee of Computer Science and Engineering of BAETE. He is also involved in curriculum development and review of CSE. He chaired the taskforce for the preparation of the Version 3.0 of the BAETE manual.

Arshad M. Chowdhury is currently serving as the Dean of the BSRM School of Engineering and the Director of the Institutional Quality Assurance Cell of the Brac University, Bangladesh. He has over 25 years of academic and industrial experiences in teaching, research and academic administration. Prior to joining BracU in 2019, he was with North South University, where he has served in various capacities including Dean of the School of Engineering and Physical Sciences, Chair of the Department Electrical and Computer Engineering, Director of the Confucius Institute. From 2007 to 2010, he worked as a Research Fellow/ Research Engineer-II at the Optical Network Research Laboratory in the School of Electrical and Computer Engineering at Georgia Institute of Technology. From 1999 to 2002, he worked as a Research Scientist in the Optical Internetworking Research division at Telcordia Technologies (formerly Bell Communication Research), Red Bank, NJ.

Dr. Chowdhury has a BS in Computer Science and Engineering from BUET, Dhaka, MS from Write State University, USA and PhD in Electrical and Computer Engineering from Georgia Institute of Technology, USA. He is a co-inventor of 15 granted US patents as co-inventor and published more than 95 peer-reviewed journal and conference papers. He is an active reviewer of IEEE Photonic Technology Letters, Journal of Lightwave Technology, OSA Journal of Optical Communications and Networking.

Dr. Chowdhury is an active resource person of the Board of Accreditation for Engineering and Technical Education, Bangladesh as a trainer and program evaluator. He is serving as the Co-Chair of the Quality Assurance Cell of BAETE and one of the key members of BAETE's Taskforce for Outcomes-based Accreditation Manual preparation and Taskforce for Development of Training Module for Program Evaluators. Dr. Chowdhury attended numerous training workshops, seminars and symposiums of outcome-based curriculum development as a participant as well as resource person.

KEYNOTE TALK 6

INCORPORATION OF SDGS INTO ENGINEERING EDUCATION IN BANGLADESH

Prof. Kazi Bayzid Kabir
Member Secretary, BAETE

ABSTRACT

The United Nations in its 2015 general assembly adopted an outcome document for the adoption of its post-2015 development agenda. This document provided a plan of action with 17 sustainable development goals (SDGs) and 169 targets aimed to end poverty and hunger, protect the planet from degradation, and to ensure that human beings are able to enjoy a prosperous and fulfilling life and that economic, social and technological progress is achieved in harmony with nature. Bangladesh in one of the 193 countries adopting and implementing SDGs since 2016. Bangladesh is currently ranked 104th in the SDG index rank with an overall score of 64.2. The recent progress report showed that Bangladesh is on track to achieve SDG achievement in four goals, while various levels of challenges remain in the rest. The contributions of engineering professionals are crucial to ensure for the advancement of each of the goals in a developing economy with limited resources, e.g., Bangladesh. The Country needs engineers with skills, able to contribute in each of the 17 goals, in sufficient numbers. One way of upskilling of the practicing engineers is through continuous professional development. However, it has become imperative that the engineering education can provide engineering competencies required for solving multidisciplinary complex problems contributing to sustainable development. This presentation focuses on an overview of how engineering professional can contribute to each SDGs and how the engineering programs can incorporate SDGs in their curriculum and teaching-learning process.

Kazi Bayzid Kabir is a Professor of Chemical Engineering at Bangladesh University of Engineering and Technology. Dr. Kabir completed his PhD from Monash University in 2014. Before that, he completed his MSc in Chemical Engineering in 2009 and BSc in Chemical Engineering in 2004 from BUET. Dr. Kabir has been involved in energy research with emphasis on solid fuel conversion (pyrolysis and gasification), syngas conversion to liquid and gaseous fuels via heterogeneous catalysis, waste-to-energy through hydrothermal treatment, and life-cycle assessment and techno-economic assessment of energy conversion processes. Apart from teaching and research, Dr. Kabir also has keen interest in academic quality assurance. He is currently the Additional Director of BUET's Institutional Quality Assurance Cell and works closely with the Strategic Planning and Quality Assurance Division of UGC. Dr. Kabir is also the Member Secretary of the Board of Accreditation for Engineering and Technical Education since March 2021.

Dr. Kabir is a Life Member of The Institution of Engineers, Bangladesh, as well as Senior Member of the American Institute of Chemical Engineers and Associate Member of the Institution of Chemical Engineers.

KEYNOTE TALK 7

BEST PRACTICES IN ACCREDITATION: LEARNING FROM OUR INTERNATIONAL COMMUNITY

Em Prof. Elizabeth Taylor
Chair, Washington Accord, International Engineering Alliance

ABSTRACT

For engineering, accreditation is a powerful tool to support standards, quality assurance and mobility. However, as meeting the challenges of the future will require an evolved engineering profession it will be imperative that accreditation avoids becoming a barrier to healthy innovation. It is difficult to achieve a quality assurance/innovation balance while operating a known, tested and comfortable system and there is no easy or singular path to address this. One powerful tool we can leverage is our openness to working together across the diversity of our international engineering community. Our willingness to gain insight from the ways in which our different cultural, socio-political and legal environments inform our work, to find common ground and build a strong network from our collective understanding can provide a creative/ safe mechanism to evolve our accreditation for future needs. This presentation will provide case studies on international collaboration exploring and articulating best practices in accreditation.

Elizabeth Taylor specialises in governance effectiveness and analysis of complex projects and ecosystems.

Her career has spanned industry, design and construction, and academe. Since 2013 she has focused on analysis of complex engineering projects. Elizabeth has built extensive Board-level leadership in professional organisations and innovative technology entities. Currently she is Chair of SmartCrete Collaborative Research Centre (focused on concrete) and Chair, Washington Accord, and Deputy Chair, Governing Group, of the International Engineering Alliance.

Elizabeth has always engaged in diverse pro-bono work. Currently she is Chair of the Cambodian Childrens' Trust Australia. Previously she was Chair of RedR Australia, an humanitarian response agency, and Chair of RedR International.

Elizabeth is an Officer of the Order of Australia (AO), an Honorary Fellow of Engineers Australia, Fellow of the Australian Institute of Company Directors, Fellow, Academy of Technological Sciences and Engineering and has been recognised as one of Australia's 100 most influential engineers. In 2021 she was awarded Engineers Australia's Peter Nicol Russell Career Achievement Memorial Medal.

KEYNOTE TALK 8

EDUCATING THE SUSTAINABILITY ENGINEERS OF THE FUTURE

Dr. Mandy Liu
Deputy Chair, Sydney Accord, International Engineering Alliance & Deputy Executive Director, IEET

ABSTRACT

International Engineering Alliance (IEA) published a new version of Graduate Attributes and Professional Competencies (GAPC) in June 2021, and all signatories/members are required to have a roadmap of compliance in 3 years. The new GAPC is historical in the sense that sustainability, the key word for the 21st century, is firmly and solidly incorporated into the new version. Therefore, accreditation agencies under Washington Accord, Sydney Accord, and Dublin Accord must demonstrate with evidence that their accreditation systems are able to be meeting the target. The first step forward is obviously a review of the current accreditation criteria and revise if necessary. Nevertheless, criteria revision is always easy to do, but the problem is whether the revision is only superficial. Afterall, the function of an accreditation agency is to facilitate real change of engineering education. This talk is to show how IEET, the accreditation agency for engineering and technology education in Taiwan, go about assisting programs enhance training of sustainability to the future engineers.

CURRENT POSITION
2004 ~present
Deputy Executive Director of the Accreditation Council and Office Director, IEET

PREVIOUS POSITION
2001 ~ 2004
Research Associate, American Association of Medical Colleges (AAMC), Washington DC, USA

EDUCATION
2001
Ph.D., Claremont Graduate University, USA

INTERNATIONAL ACCORDS RELATED EXPERIENCE
2021~present
Deputy Chair, Sydney Accord 2018 Panel Member, WA Verification Review Team to CACEI (Mexico)

2004 ~present
IEET's main contact window to the International Engineering Alliance

KEYNOTE TALK 9

BEST PRACTICES IN EVALUATION FOR ACCREDITATION OF PROGRAMS - BAETE PERSPECTIVES

Prof. Anisul Haque
Board Member, BAETE

ABSTRACT

BAETE, IEB accredits those tertiary engineering programs in Bangladesh who voluntarily apply to BAETE for accreditation. An Evaluation Team (ET), constituted by BAETE, rigorously evaluates the program as per benchmark standards stipulated in each of the ten accreditation criteria. After the evaluation, the ET makes a recommendation based on its findings which serves as the basis for the accreditation decision by the Board after two rounds of consistency checks. All the documents, for example, the accreditation criteria, the benchmark standards, decision making process, guidelines for ET and programs are available to the public. However, the actual process that the ET follows during the evaluation, from reviewing the self-assessment report (SAR) to submitting the ET, report is not clear to everyone. In this presentation, we will discuss the best practices in every step of the evaluation by the ET. It is expected that sharing these experiences will on the one hand, help the evaluators in conducting evaluations more consistently giving due consideration to key issues, such as, complex engineering problem solution. On the other hand, programs, knowing what the evaluators will be looking for, will be able to prepare better for the evaluation.

Anisul Haque is working as a professor in the Department of Electrical and Electronic Engineering, East West University since 2006. He has also served as the Chairperson of the Department of EEE and the Dean of the Faculty of Sciences and Engineering. Before joining East West University, he taught at the Electrical and Electronic Engineering Department, BUET for eighteen years. He has been a visiting faculty at Tokyo Institute of Technology, Japan, University of Connecticut, USA and Clarkson University, USA. Dr. Haque's research interests include the physics, modeling, simulation and characterization of nanoelectronic devices and photovoltaic devices and systems. He is also interested in engineering education. Dr. Haque is the recipient of the Bangladesh University Grants Commission Award in 2006 and the gold medal from the Bangladesh Academy of Science in 2010. Dr. Haque was an editor of IEEE Transactions on Electron Devices from 2010 to 2019. He also served as an associate editor of IEEE Access from 2013 to 2023. He has been serving as an IEEE Distinguished Lecturer since 2009. He is also in the Board of Accreditation for Engineering and Technical Education, The Institute of Engineers, Bangladesh as a board member. Dr. Haque has conducted many training and workshop sessions on Outcomes Based Education (OBE) for academic program leaders and on Outcomes Based Accreditation for BAETE program evaluators.

KEYNOTE TALK 10

BAETE ACCREDITATION PREPARATION - PROGRAM'S PERSPECTIVE

Prof. Salekul Islam
Member, BAETE Taskforces

ABSTRACT

BAETE accreditation process is voluntary. An institution submits an application for the accreditation of an eligible program without persuasion or pressure. A program may face many challenges when it prepares for accreditation. The talk is focused on helping the programs in that preparation by discussing the best practices. A program needs to identify the gaps between the current practice it follows and the BAETE proposed accreditation process. This talk will help a program to identify the processes it should develop and practice in the way of applying for BAETE accreditation. The talk will introduce the BAETE accreditation process by discussing the major steps of accreditation. It will also guide a new program or an existing program applying under manual v2.1 for the first time to the starting point of the preparation process, i.e., the manual, Self-Assessment Report (SAR) template, Evaluation Team (ET) Report template, etc. Special emphasis will be given in attaining different outcomes and demonstrating complex engineering problems and activities in teaching, learning and assessment. Next, documents needed for writing the SAR will be presented. Finally, the talk will be concluded with a discussion on taking preparation for the ET visit.

Salekul Islam is a professor and also the Head of the Computer Science and Engineering Department at United International University (UIU), Bangladesh. Prior to joining UIU, he served as an Assistant Professor at North South University, also located in Bangladesh. In addition, he was an FRQNT Postdoctoral Fellow at the Énergie, Matériaux et Télécommunications (EMT) center of Institut national de la recherche scientifique (INRS) in Montréal, where he was advised by Dr. Jean-Charles Grégoire. Professor Islam earned his PhD from the Computer Science and Software Engineering Department of Concordia University in June 2008, under the supervision of Dr. J. William Atwood.

ARTICLE

OUR ENDEAVORS FOR SUSTAINABLE DEVELOPMENT

Prof. AFM Saiful Amin
Acting Chairman and Vice Chairman-1, BAETE
The Institution of Engineers, Bangladesh

OUR ENDEAVORS FOR SUSTAINABLE DEVELOPMENT

The process of continuous quality improvement requires abilities far beyond reading–writing and delivering events. Human civilization has to progress with learning, unlearning and relearning in this 21st century. Considering and expanding existence beyond our blue planet, it is also our aim to keep the vast majority of world population on this planet in peace and harmony, at least for a few centuries. Engineers are responsible for leading the progression at both extremities within the planet and the extraterrestrial activities with ample interaction among all disciplines of knowledge, encompassing science, arts, humanities and commerce to achieve the best results for civilization's welfare.

In this century, the world has reached a unified consensus in outlining a set of 17 goals for sustainable development of this planet. It was a process to unlearn the injuries of the past and relearn the forgotten bests. Each country is responsible for attaining the 17 goals within its individual influence horizon. Engineers in Bangladesh will have to be devoted to the best display of engineering feats through triple integration within the problem–analysis–synthesis solutions, social responsibilities and workplace skills. This need is required to be deeply rooted in the teaching and learning systems followed in the four-year bachelor programs, in which basic engineering courses lead to the final year's capstone project, community-level services to community engagement and industrial talks and visits to industrial problem-solving. This imparts a multi-dimensionality in the engineering curriculum so that future engineers become ready to support sustainable development.

Through the continual learning process, we believe humans have explored much of the basic knowledge domain related to our planet. Every day, we are discovering many delicate links within our ecosystem. In our future activities, we need to be able to talk to nature, the environment and society to determine careful human intervention for development and avoid irrecoverably disrupting the delicate invisible links within. While we do need to mitigate past misdeeds, we also need to relearn many factors to create a better framework.

With the goal of building a better world, the 'Institute of Engineers, Pakistan' was established in 1948 in what was then the *Dacca, East Pakistan* by some of our past visionary leaders of our present land, when the Institution that existed in the undivided land was inaccessible due to geopolitical maneuverings. Today's Institution, the IEB, that emerged in 1971 after our historical war of independence, relies on the strengths and excellence gathered over 75 years of independent operational history, enriched through interactions and cooperation at national and international levels. In this long curvilinear trajectory, the Institution of Engineers, Bangladesh was fortunate to have numerous visionary leaders of this soil on this difficult path. While engineers of this soil ever celebrate their historical contributions to conducting great trigonometrical surveys, culminating in many new approaches for fundamental and applied science to declaring the height of Mount Everest (the highest peak in the world) as well as later designing and constructing the world's tallest buildings and long bridges on the soft alluvial soils of the Ganges delta, our engineers are also addressing many difficult contemporary challenges in all branches of engineering to support sustainable economic growth to eradicate the poverty for once and for all. In this process, we need to relearn societal needs, environmental demands, humanity's need for interaction and, above all, how to save our blue planet from human-induced destruction. The Institution of Engineers, Bangladesh has committed itself to create a pathway for Bangladesh and the world at large through the activities of the BAETE. This shall start from the education system and obviously lead to the professional competencies in delivering knowledge as well as hard and soft skills in devising and implementing a development plan. Accreditation of programs to ensure the education quality sets the pathway.

Bangladesh will see its economy rising with sustainable growth. A healthy economy brings further opportunities for development. We are fortunate to have the opportunity to reduce unforeseen gloomy futures by keeping pace with the world's changes, challenges and knowledge enrichment by anticipating circumstances and initiating responses. Our education system foresees a paradigm shift in which future engineers trained for sustainable development goals will not only acquire competencies for creative learning and thinking, complex problem-solving, interdisciplinary and international cooperation and ethical attitudes, they will take an academic, technical, knowledge-focused path to a much broader interdisciplinary approach to updated learning. The education system will see a shift from a teacher-centric focus to one that is more student-centered and real life problem-based.

The BAETE, created within the Institution of Engineers, Bangladesh, has gained a level of significant maturity since its inception in 2003 and confidence in the country and beyond. We are ever committed to keeping our engineering education system aligned with world demands to ensure the world-class quality of our future engineers. We are working to eradicate stagnancy within ourselves to allow us to keep up with world changes. Within the Institution of Engineers, Bangladesh, BAETE is entrusted to develop a country-specific recipe to handle this challenge for the nation and the world.

ARTICLE

ACCREDITATION FOR HIGHER EDUCATION IN BANGLADESH

Prof. Sanjoy Kumar Adhikary
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ACCREDITATION FOR HIGHER EDUCATION IN BANGLADESH

Accreditation in higher education (HE) is a collegial/sharing process based on self- and peer assessments. It ensures quality and accountability of HE institutions and their academic programs at an acceptable level. The accreditation system in American HE began in the late 1800s and early 1900s as a way for colleges and universities with high academic standards to distinguish themselves from institutions that claimed to be colleges but had curricula similar to many high schools. Nowadays, accreditation has been practiced in many countries for ensuring quality in education. Various countries have established several agencies for quality assurance (QA) and accreditation, which are internationally reputed, such as Accreditation Board for Engineering and Technology (ABET), Association to Advance Collegiate Schools of Business (AACSB) and Accreditation Council for Business Schools and Programs (ACBSP) in USA; Quality Assurance Agency (QAA) of Great Britain; British Accreditation Council in UK; Barbados Accreditation Council (BAC) in Barbados; Bahrain Accreditation Council (BAC) in Bahrain; European Consortium for Accreditation in Higher Education (ECA) in Netherlands; the Malaysian Qualifications Agency (MQA) in Malaysia; National Assessment and Accreditation Council (NAAC) in India; the New Zealand Qualifications Authority (NZQA) in New Zealand; Tertiary Education Quality and Standards Agency (TEQSA) in Australia; and so on. The Council of Institute of Engineers Bangladesh (IEB) was empowered by the general body and formed the Board of Accreditation for Engineering and Technical Education (BAETE) in 2003 so as to provide program accreditation with sound knowledge of foundations in science and mathematics, leading to the practice of engineering with an acceptable level of professional competence. The IEB is a provisional signatory of the “Washington Accord.” By this time, BAETE provided accreditation of about 79 engineering programs in various universities of Bangladesh. However, unfortunately, Bangladesh did not have any national-level organization for QA and accreditation for all area of HE until 2018.

UNESCO data show that about 24,112 students went abroad from Bangladesh for HE in 2015 and that the number quadrupled by 2020. Every year, 70,000–90,000 Bangladeshi students go overseas for higher studies. UNESCO data indicated that the number of learners’ mobility has been increasing alarmingly with the elapsed time but that the mobility of students from overseas to Bangladesh is insignificant. Important reasons for virtual one-way mobility might include a lack of quality and relevance, a less-friendly working environment, and poor employability. Increased gross domestic product (GDP) encourages the middle-income group of people to spend money on their children’s HE abroad. On the other hand, a large amount of remittance is incurred for the foreign skilled personnel working in Bangladesh. Stakeholders have employed foreign skilled personnel with full confidence. This means that graduates produced by the HE institutions are not fit for the purpose. This also indicates the lack of quality and relevance.

However, academicians and policymakers of Bangladesh felt there were gaps between the attainment of learners at the post-higher secondary level and the knowledge, skills, creative abilities, moral qualities, and ethics, considering the societal needs compromising quality education with its relevance, as indicated in the Strategic Plan for Higher Education (SPHE) 2006–2026. There was no formal QA mechanism in both the national and institutional levels in the HE subsector of Bangladesh. SPHE (2006–2026) suggested the establishment of an independent accreditation council for QA in HE in Bangladesh. In compliance, the government undertook an initiative for implementing a higher education quality enhancement project (HEQEP) with the financial assistance of the World Bank in 2009, where the QA mechanism in both the national and institutional levels was initiated in 2014. This was followed by establishing an enabling framework for internal quality assurance (IQA), and it was later named Institutional Quality Assurance Cell (IQAC) in 69 universities.

Bangladesh Accreditation Council (BAC) was established in August 2018, under BAC Act 2017, to provide guidelines and to supervise and monitor QA at the program and institutional levels of higher education institutions (HEIs). This is a major step taken by the government to ensure the HE subsector is internationally accepted. This will help to overcome the prevailing shortcoming. The Strategic Plan for Higher Education in Bangladesh (2018–2030) showed the trend of increasing GDP (8%), Bangladesh needs to enhance the quality of HE parallelly for increasing the graduates’ skills and competency. It is essential to integrate advanced technological content into curricula and to ensure the conversion of a very large number of people into human capital who can compete successfully in the global knowledge economy. After centuries of technological progress and advances in international cooperation, the world is more connected than ever before. To achieve such an expectation, the government approved the internationally benchmarked framework entitled Bangladesh National Qualifications Framework (BNQF) in 2021, another breakthrough in our education sector. BNQF is considered an instrument for ensuring quality and relevance in HE, which is a critical issue in the education sector—that is, for lifelong learning with a clear, flexible pathway from one level to another and from one subsector to another through Recognition of Prior Learning (RPL) or Accredited Prior Experiential Learning (APEL), in alignment with the global practices. The learning outcomes are the means of entry from one level to the corresponding higher level.

Establishing a quality academic culture with accreditation practices is a big challenge that we must face. This includes, for example, a lack of responsive and innovative leadership; inadequate investment in education, especially HE; lack of adequate infrastructure; inadequate knowledge about QA and accreditation; lack of quality and relevance; traditional mindset of the academicians and faculty; reluctancy to change and unwillingness to be a changemaker; lack of initiative for professional development of faculty; politicization in academic institutions; weak collegial environment; poor student-friendly learning environment; and so on. To overcome these challenges, we must make concerted efforts to address all concerns from both public and private organizations, particularly those working on QA and accreditation. Bangladesh University Grants Commission (UGC), Bangladesh Medical and Dental Council (BMDC), Bangladesh Nursing and Midwifery Council (BNMC), Bangladesh Veterinary Council (BVC), Bangladesh Bar Council (BBC), Pharmacy Council of Bangladesh (PCB), BAETE, BAC, and other similar organizations should come forward to work together in this regard.

Above all, the academicians should take the responsibility to transform the landscape of Bangladesh's HE and overcome the mismatch to the labor market with the alignment of the international standards, which will help us increase the employability of graduates within and outside the country. This endeavor will ensure the mobility of skilled manpower throughout the world and the country, and that will help in earning the dividend using the opportunities created by globalization.

ARTICLE

WHY BAETE ACCREDITATION MATTERS?

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WHY BAETE ACCREDITATION MATTERS?

There is always the question of why academic programs need to be accredited and what the aim of the accreditation organization is. The earliest universities in the world initially had no push for accreditation. The University of Bologna in Italy was the first true university in the West late in the eleventh century. It became a widely recognized school to educate clergy. Many significant changes have taken place in the role of a university since then. The focus gradually shifted from teaching to both teaching and basic research. Research was curiously driven, without any consideration of the application of such research results. Teaching was for students from elite families. Germany Humboldtian research university became a global model in the late nineteenth century, spreading from Europe to the USA. Observable changes over time can be found in education systems, teaching methods, types of research, and the types of students who attend universities. Youths from different walks of life are now coming both to the public and private universities for higher studies. The objectives of higher education have shifted from creating the elites needed for civic service to the need for educated masses to support economic growth. Graduates are moving abroad to seek employment in the era of globalization. As a result, nations push for the creation of National Qualifications Frameworks (NQFs) that are compatible with one another. Each country sets its own objectives when developing its own NQF but the following objectives are mainly presented: (i) make the training levels easier to understand and strengthen the coherence of qualification systems and permeability of education; (ii) support lifelong learning; (iii) aid recognition and transfer of credit and prior learning; (iv) strengthen the link between training and labor market; and (v) facilitate the international recognition of national qualifications.

The road to the current level of the educational system was time-consuming and fraught with challenges. Formal education in ancient societies (1200–4000 B.C.) was practical and designed to prepare scribes and priests (1200–4000 B.C.). Scribes were present to take notes on the food supplies, judicial hearings, wills, and other legal documents that were important to the administration's efficient operation. The educational system underwent considerable modifications throughout both the first and second industrial revolutions (1765-1870 and 1870-1969). The chalkboard, an essential educational device, was invented by instructors in the middle of the 19th century to help with instruction. Up to the advent of whiteboards in the late 1980s, this was the only teaching aid used in the classroom. The children were educated about traditions, customs, rituals, and religion during the pre-industrial revolution era. Students are taught about science, technology, language proficiency, math, and other subjects in modern education. Henry Fischel, an American businessman, developed the idea of tests in the late 19th century. China was the first nation to accept the idea of tests, and it held the first exam ever. In 1906, the Carnegie foundation in the USA defined a course's credit. Computerization, digitization, and web-based interconnection were the results of the third industrial revolution (1969 to 2000). In addition to using blackboards and whiteboards during lessons, teachers have started employing overhead projectors and the internet. The curriculum is based on books. With the idea that all the information could be neatly organized into a body of knowledge, divided into the 12 years of schooling and the four years for graduation, distributed through graded textbooks, and tested on a regular basis, the factory model of education was developed. All three revolutions are characterized by centuries of experience with memorization, centered on teacher and student interaction via dictation and writing lecture contents on chalkboards; it was a one-way process, with students primarily serving as consumers of information.

We see the industrial revolutions kicked off changes in the educational system. We now live in the Fourth Industrial Revolution (4IR). The 4IR conceptualizes rapid change to technology, industries, and societal patterns and processes in the 21st century due to increasing interconnectivity and smart automation. The term was popularized in 2015 by Klaus Schwab, the World Economic Forum founder and executive chairman. The following are the key skills that employees in the present new economy need to have: basic skills (reading, writing, and math), foundation skills (learning how to learn), interpersonal and teamwork skills, listening and oral communication skills, adaptability (creative thinking and problem-solving), group effectiveness (interpersonal skills, negotiation, and teamwork), influence (organizational effectiveness and leadership), personal management (self-esteem and motivation/ goal setting), cognitive style, and applied skills (occupational and professional competence). Present and future Jobs require new skills and knowledge. Therefore, the education system has been rethought and redesigned in order to respond to changes in workers' skill sets. Education as it currently stands places an undue emphasis on the input that teachers provide rather than the outcomes that students learn. It merely imparts concepts and knowledge to students, paying no attention to whether they have learned them or not. This system focuses too much on what the teachers teach as input rather than what the students are learning as the outcome. It repeats the

humdrum way of teaching-learning process that just focuses on memorizing the skills of students rather than skill development. Outcome-Based Education (OBE), a totally new approach, is currently gaining considerable interest in the educational system. It is a student-centric teaching and learning methodology in which the course delivery and assessment are planned to achieve specified objectives and outcomes. WHAT and WHETHER students learn successfully is more important than WHEN and WHERE they learn it. However, in the 4IR, the educational system switches to an OBE, the teaching paradigm shifts from an instructional paradigm to a learning paradigm, and each student's performance on the course learning outcomes (CLOs) set by the course instructor is evaluated.

Changes have been made to the accreditation procedure as well. The history of accreditation for university programs can be traced back to the early 20th century in the United States. The concept of accreditation emerged as a way to establish standards for quality assurance in higher education and to ensure that institutions and their programs met certain criteria of academic excellence. Accreditation has since become a widely recognized and established process for evaluating and verifying the quality of education offered by universities and their programs. Accreditation has changed in the twenty-first century to keep up with the demands and developments in higher education as the educational system and student performance assessment have undergone tremendous changes. There has been a growing emphasis on outcomes-based assessment, student learning outcomes, and continuous improvement. In addition, new models of accreditation, such as programmatic accreditation and competency-based accreditation, have emerged to accommodate non-traditional forms of education, such as online learning and competency-based education. Universities in Western Countries and also many developed countries have already shifted their education systems to OBE.

Should we not consider Bangladesh and its universities? Bangladesh was liberated as an independent country in 1971, and at that time, there existed only six public universities, and the total number of students was around 25,000. At present, there are 53 public and 102 private universities, and total enrollment excluding national and open universities exceeds 0.6 million. The BNQF has been formulated to ensure that qualification outcomes remain relevant and nationally consistent, continue to support flexible qualifications linkages and pathways enable national and international portability and comparability of qualifications. Facilitate the implementation of quality assurance mechanism and national qualifications framework at the higher education institution (HEI) and program levels, Bangladesh Accreditation Council has recently been established. University Grants Commission of Bangladesh has asked universities to adopt OBE. Various stakeholders have expressed concerns regarding the caliber of university education and the employability of graduates. As a result, academic program accreditation is important to educators and policymakers. In order for our graduates to be able to obtain employment in their countries, several industrialized nations are requesting that we change our educational system and guarantee quality education.

The Institution of Engineers, Bangladesh is making a commendable contribution to improving the caliber of engineering education through its Board of Accreditation for Engineering and Technical Education (BAETE). In the context of the fourth industrial revolution, BAETE acknowledges that program accreditation under a new set of criteria is crucial for assuring quality, industry recognition, global mobility, innovation, and stakeholder confidence. Accreditation is essential for equipping graduates with the information and abilities they need to prosper in the fourth industrial revolution's fast evolving environment. In order for our graduates of the programs recognized by BAETE to be accepted by other nations, BAETE considers recognition of BETE by a foreign accreditation organization to be important. BAETE is attempting to become an official signatory to the Washington Accord. BAETE is currently an Accord member on a temporary basis.

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