

Journey of Bangladeshi Engineering Education to Become a Full Signatory to the Washington Accord in 2024

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Abstract

The accreditation process of engineering degree programs, governed by the Washington Accord, aims to benchmark engineering education across different countries against a set of criteria. This paper presents the journey of Bangladesh to become a full signatory to the Washington Accord with the anonymous support from twenty-three signatory countries of the International Engineering Alliance (IEA) on the 12 June 2024. The Board of Accreditation for Engineering and Technical Education (BAETE), established in 2003 as an independent body of the Institution of Engineers Bangladesh (IEB), is responsible to accredit Bachelor of Engineering degrees offered by Bangladeshi universities and colleges. As Bangladeshi engineering degrees were not accredited before, the engineers were facing multiple challenges to work in the developed countries like the USA, UK, Australia and Canada. These include higher degree research, dignified jobs, bilateral research, foreign investment in Bangladesh, immigration and others. The Australian chapter of IEB played a significant role in achieving this recognition as presented in this paper. It is expected that this recent recognition of Bangladeshi engineering programs will enhance the collaboration of engineering disciplines of both Australia and Bangladeshi universities. The outcome-based engineering educations in Bangladesh as recognized by the Washington Accord will assist Bangladeshi engineers to meet the growing challenges of sustainable development in Bangladesh and other full signatory member countries of Washington Accord.

Keywords: Washington Accord; Accreditation; Engineering Education; Collaboration

1. INTRODUCTION

The international quality control system in engineering education is based on an accreditation system called “Washington Accord” in 1989. There were six countries namely Australia, Canada, Ireland, New Zealand, United Kingdom and United States formed this mutually agreed Accord for undergraduate engineering program (IEA, 2024). Over the time, the total number of member countries increased to 23 in 2024. The accreditation system is also aimed to set criterion for professional engineer, who can work across the different signatory countries.

The Board of Accreditation for Engineering and Technical Education (BAETE), established in 2003 as an independent body of the Institution of Engineers Bangladesh (IEB), is responsible to the accreditation of Bachelor of Engineering degrees offered by Bangladeshi universities and colleges (Amin, S. AFM; 2024). As Bangladeshi engineering degrees were not accredited before, the engineers were facing multiple challenges to work in the developed countries like the USA, UK, Australia and Canada. These include higher degree research, dignified jobs, bilateral research, foreign investment in Bangladesh, immigration, and others. Bangladesh was given provisional membership for Washington Accord

accreditation in 2016, which is common for any country who intends to get the full accreditation as per International Engineering Alliance (IEA) requirements. Generally, provisional accreditation lasts from 2-4 years. During this time, the member country is required to work through mentorship from at least one full signatory country. However, Bangladesh had to work about 8 years to overcome various issues and requirements as part of the Outcome Based Education (OBE) system with the mentorship from Singapore and Malaysia.

The Australian chapter of IEB has been working with various stakeholders since 2016 towards achieving full Washington Accord signatory status. This paper presents the journey of Bangladesh to become a full signatory to the Washington Accord with the anonymous support from the 23 signatory countries of the International Engineering Alliance (IEA) on the 12 June 2024.

2. HISTORY OF ENGINEERING EDUCATION IN BANGLADESH

There have been several studies on engineering education in Bangladesh. For example, Chowdhury and Alam (2012) presented an overview of engineering education in Bangladesh. Chowdhury et al. (2013) examined the quality control and accreditation of engineering degrees in Bangladesh. More recently, Islam et al. (2023) evaluated quality assurance of engineering education in Bangladesh.

Engineering education in Bangladesh formally started in 1876 when Dhaka Survey School was established under British Raj. After formation of East Pakistan, this Survey School was upgraded to Ahsanullah Engineering College in 1948 under The University of Dhaka to produce graduate engineers who can lead infrastructure development of newly formed East Pakistan. In 1962, Ahsanullah Engineering College was upgraded to East Pakistan University of Engineering and Technology and in 1971, this was renamed as the Bangladesh University of Engineering and Technology (BUET). BUET has produced many engineers who have made significant contributions to engineering industry locally and globally.

To meet the growing demand of engineers, three more engineering colleges were established in regional big cities (Rajshahi, Chittagong and Khulna). Later, to train diploma engineers, Dhaka Engineering College was established in Gazipur, near Dhaka. These four engineering colleges were upgraded to Bangladesh Institute of Technology (BIT); in 2003, these were upgraded to engineering universities (Chowdhury et al., 2008). The current ranking of these engineering universities is presented in Table 1. Currently there are 103 institutions (including public, private and international universities and colleges), which offer Bachelor of Engineering program (Edurank, 2024; BAETE, 2024).

Bachelor of Engineering program has a duration of four years in all the institutions. Many of the general universities now offer Bachelor of Engineering programs, e.g., The University of Dhaka has five engineering departments. There are four government engineering colleges in Barisal, Faridpur, Mymensingh and Sylhet. Islamic University of Technology is also a prestigious engineering university in Bangladesh, which is not funded by Bangladesh Government. Also, Bangladesh Agricultural University has Bachelor of Agricultural Engineering program, which is well recognized. Bangladesh University of Textiles is the most prestigious institution offering Bachelor of Textile Engineering degree in Bangladesh. Among private universities, Ahsanullah University of Science and Technology has earned a good reputation.

Table 1. Major public engineering universities in Bangladesh and their global ranking

University	Year established	Number of yearly intakes	Times Higher Education Ranking (THE) 2025	Quacquarelli Symonds (QS) Ranking 2025
Bangladesh University of	1948	1309	1001-1200	761-770

Engineering and Technology (BUET).				
Rajshahi University of Engineering and Technology (RUET)	1964	1235	1201-1500	None
Chittagong University of Engineering and Technology (CUET)	1968	920	1001-1200	1201-1400
Khulna University of Engineering and Technology (KUET)	1967	1060	1001-1200	1201-1400
Dhaka University of Engineering and Technology (DUET)	1980	730	None	None

Table 2 shows the top 15 countries producing the highest number of engineers per year. Although Bangladesh is the 8th most populous country globally (170 million people), but in terms of production of graduate engineers per year, it is far behind than many other countries. The estimated graduate engineers produced in Bangladesh is less than 15,000 including all the public and private engineering institutes. The Vietnam has a population of 100 million, which produces about 8 times more engineers per year than Bangladesh.

Table 2. Top 15 countries with highest number of graduate engineers (Cityglobe Tour, 2024)

Rank	Country	Number of graduates produced per year
1	China	452,000
2	Russia	448,000
3	India	295,000
4	USA	268,000
5	Iran	247,000
6	Japan	168,000
7	South Korea	168,000
8	Brazil	153,000
9	Indonesia	151,000
10	Ukraine	150,000
11	Germany	149,000
12	Vietnam	121,000
13	Mexico	119,000
14	UK	117,000
15	France	116,000

3. GAINING FULL SIGNATORY OF WASHINGTON ACCORD

Quality control of engineering education is being measured through Washington Accord since 1989. Professional representatives from six countries (Australia, Canada, Ireland, New Zealand, United Kingdom, and United States) formed this mutually agreed Accord for undergraduate engineering programs. Over the time, the total number of member countries increased to 23 in 2024. Outcomes Based Education (OBE) is the key requirement to become a member of the Washington Accord. The OBE teaches not only engineering contents, but also many other aspects of learning including ethics, professional engineering matters, leadership, management, practical design, communication and sustainability (Oladiran and Uziak, 2009).

Since 2011, BAETE has been working through IEA to get provisional Washington Accord Accreditation, and it was finally approved in 2016. Following the requirements of OBE, BAETE developed a comprehensive accreditation system in Bangladesh. There are also many other requirements that need to be fulfilled by the universities to get the BAETE accreditation (e.g. Table 3). As per the requirements of the IEA, the provisional member country needs to engage at least one mentor from a full signatory country. This led Bangladesh to engage Singapore and Malaysia as “mentors”. In addition, BAETE was working through many other signatory countries/professional bodies to understand their own accreditation process. Engineers Australia (EA) was one of the examples, where BAETE worked through their Australian Overseas Chapter of IEB since 2016.

Table 3. Typical criteria for engineering program accreditation in Bangladesh (BAETE, 2024)

Criterion	Name
1	Organization and Governance matters
2	Financial and Physical Resources aspects
3	Faculty
4	Students
5	Academic Facilities and Technical Support
6	Curriculum and Learning Processes
7	Program Educational Objectives
8	Program Outcomes and Assessment
9	Continuous Quality Improvement
10	Interactions with the Industry

The following section describes how Australian Overseas Chapter worked with EA, BAETE and many other stakeholders to smoothen the process of getting full Washington Accord Accreditation for Bangladesh.

1. Delegates of IEB Australia Chapter first met with EA Sydney Chapter’s senior executives on 30 May 2018 to understand the Australian Universities accreditation system. The delegates also discussed how Bangladeshi engineers are contributing to various fields in engineering and technology in Australia. Accordingly, the first author of this paper (Secretary, IEB Australia Chapter) and IEB Australia Chapter’s team investigated the EA accreditation system, and started working through various engineering universities in Bangladesh, BAETE and IEB headquarters collaboratively. The EA accreditation system involves assessment on three areas namely operating environment, academic program and quality control system (EA, 2024).
2. A Chartered Professional Engineer (CPEng) seminar was organised by IEB Australia chapter in collaboration with and EA in Sydney on the 4 December 2018. Distinguished guests namely H.E. Bangladesh High Commissioner Mr Mohammad Sufiur Rahman, former CEO of Engineers Australia Mr Peter McIntyre and about 120 graduate Bangladeshi engineers attended in this program. H.E. Mohammad Sufiur Rahman delivered an insightful speech on engineering education system, mega projects, growth in engineering sector and necessity of Washington Accord Accreditation for Bangladeshi engineering graduates. The CEO of EA Mr Peter McIntyre acknowledged that Bangladeshi engineers are contributing to Australian economy and will continue to do so through the bilateral relationship between EA and IEB. The first author of this paper then focused on various challenges of Bangladeshi engineers that are facing in Australia and abroad. With this IEB Australia chapter's initiative, IEB headquarters and Engineers Australia made a strong relationship between the two institutes.
3. Furthermore, on 10 June 2019, the chapter organised a warm welcome reception for the former honourable IEB President Engr Md Abdus Sabur. In this reception program, the local executive

committee provided significant input to the president on the necessity of Washington Accord Accreditation and various challenges of BAETE accreditation process that our universities are facing with. This program made the local committee to aware about Washington Accord Accreditation to the president and other senior executives of IEB. In his trip to Australia, the president also met with several EA officials including Sydney division president Mr Bruce Howard and General Manager Mr Greg Ewing in a prestigious Australian Academy of Technology and Engineering Innovation and Award excellence program on 13 June 2019 in Sydney. In this program leaders of both institutions had a successful discussion on “How IEB can get full signatory status of Washington Accord soon through the professional engineering capabilities and strong bilateral relationship between two institutions?”

4. The Vice Chancellor of KUET Professor Dr Sazzad Hossain, had a good discussion with Emeritus Professor Dr Elizabeth Taylor (former Deputy Chairman of Washington Accord Accreditation board) on the Washington Accord Accreditation matters on 4 May 2019 in Sydney. A reception program was hosted by IEB Australia chapter in honour of the vice chancellor, and finally KUET made three major engineering programs accreditation to the BAETE.
5. Additionally, IEB Australia Chapter worked with major engineering universities in Bangladesh since 2016 and pursued them to secure the BAETE accreditation. The chapter continuously communicated with university’s vice chancellors through formal email and other modes of communications. In an email on 6th April 2019, the chapter explained various benefits of Washington Accord including higher degree research program, jobs and immigration. With this initiative, KUET and BUET successfully completed their BAETE accreditation and prepared for Washington Accord Accreditation.
6. *World Engineers Day* was celebrated by the chapter on 4 March 2023 in Sydney. Emeritus Professor Dr Elizabeth Taylor, HE Bangladesh High Commissioner M Allama Siddiqi, Professor AFM Saiful Amin, Acting Chairman, BAETE, EA executives and distinguished engineers attended in the program. The first author of this paper shared his experience on working with various stakeholders including BAETE, EA and universities for Washington Accord Accreditation process. Professor Saiful Amin then explained the status of Washington Accord Accreditation for Bangladesh and other professional activities that BAETE is working on with international engineering partners. He then talked about various mega projects of Bangladesh, and how our engineers are contributing on these projects. In an expression note, Emeritus Professor Elizabeth Taylor showed her experience on visiting Bangladesh twice and talked about various mega projects and women in engineering education. In this meeting, H.E. honourable high commissioner demanded full Washington Accord signatory status for Bangladesh. Launching of magazine on “World Engineers Day”, and recognition of “women engineering” were two other exciting events for the audiences.
7. The development of MoUs between KUET and Western Sydney University, KUET and University of Technology Sydney (UTS), and BUET and Western Sydney University in recent years played an important role in developing a relationship among engineering institutions of Bangladesh and Australia. In this regard, both the authors of this paper took a leading role. Furthermore, the meetings of both the authors with Late Professor Dr Jamilur Reza Chowdhury in Bangladesh motivated the authors to work closely with Emeritus Professor Dr Elizabeth Taylor.
8. Finally, on September 14, 2021, BAETE submitted a self-assessment report to IEA for consideration of full signatory status. After the submission, a detailed review process including three member countries went to Bangladesh for practical onsite assessment of few universities. Then on the 12 June 2024, IEB got full signatory status of Washington Accord with the anonymous support from 23 signatory countries, in the International Engineering Alliance (IEA) meeting, held in India.

The Washington Accord achievement will enable Bangladeshi Engineers to get full accreditation in all the 23 signatory countries, which will promote higher studies, jobs, migration, research and possible foreign investments in Bangladesh.

4. BENEFITS OF WASHINGTON ACCORD- AUSTRALIA AND BANGLADESH PERSPECTIVE

The requirements of “professional engineering” practice in Australia are quite stringent, and thus engineers must be technically competent and innovative. Moreover, post graduate education, collaborative research between member countries, immigration, jobs and economic development between member countries through major projects need professional engineers. Washington Accord accredited engineering degree is the basic requirement to become a “professional engineer” these days in Australia and overseas. The following sections highlights some common benefits of Washington Accord.

- It is expected that Bangladeshi engineering programs will enhance the collaboration of engineering disciplines of both Australia and Bangladeshi universities. These include smoother entry into the post graduate research study in Australian universities, two plus two-year program in undergraduate degree, secondment of academic members between Australia & Bangladesh and creation of memorandum of understanding (MoU) between different universities of Bangladesh and Australia.
- The Washington Accord full signatory status will assist Bangladeshi engineers to meet the requirements of “professional engineers” in Australia for many government & private jobs and immigration. For example, in Austroads technical standard clearly stated Washington Accord-accredited 4-year bachelor degree requirements to become a professional engineer in Australia. It should be noted that practicing as a professional engineer is the prerequisite to become a “Chartered Professional Engineer” (EA, 2024).
- Furthermore, Bangladeshi engineers used to get their qualification assessment through EA using an alternative pathway. With the Washington Accord full signatory status, engineering graduates with programs accredited by IEB-BAETE on or after 2023 will be able to assess their qualifications directly for migration purposes from Bangladesh to Australia.
- Finally, it is expected that many Tier 1 engineering consultants and contractors will be encouraged to invest in Bangladesh through the joint procurement of engineers between member countries for many mega infrastructure and building projects. This will boost economy between member countries like Bangladesh and Australia.

5. CONCLUSION

Engineering education system in Bangladesh was inherited from the British Raj as Bangladesh was a colony of the Great Britain (as a part of British India). The first engineering college was established in Bangladesh in 1948 (about 77 years ago). Since then, many engineering universities and colleges have been established in Bangladesh who are providing four-year engineering degrees. Still the number of engineers produced in Bangladesh per year (compared to its population) is too few as compared to similar countries like Vietnam.

Bangladeshi educated engineers have been playing a major role in Australia and other developed countries in academia, public sectors and engineering industries as professional engineers. The Institution of Engineers, Bangladesh (IEB) Australia Chapter have worked closely with Board of Accreditation for Engineering and Technical Education (BAETE), IEB headquarters, major engineering universities in Bangladesh, Engineers Australia (EA) and many stakeholders for the last few years to become a full signatory of the Washington Accord, which was achieved on the 12 June 2024. This will

enable Bangladeshi educated engineers to work more effectively in Australia and other Washington Accord full signatory member countries through increased collaborations in research, jobs, economic development and professional engineering skill upgrade.

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