Washington Accord and Experiences of JABEE and IABEE

Dr Yasuyuki AOSHIMA
Advisor to JABEE International Affairs Division
(immediate past JABEE Executive Managing Director)

Chief Advisor of JICA project for
IABEE (Indonesian Accreditation Board for Engineering Education)

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- Engineering is the most advanced field in the quality assurance in professional education.

- In Western countries, historically, professional societies such as an institution of professional engineers or a council of engineers have been conducting the accreditation of education to ensure that younger generation have acquired required ability and knowledge when they have graduated from the engineering study program.
- In those countries, only graduates from accredited programs are eligible to be professional engineers.

Accreditation of Engineering Education

ABET established in 1932

Washington Accord established in 1989

Japanese universities did not have culture of quality assurance of education until 2000

JABEE triggered the outcomes-based quality assurance of university education in Japan (through accreditation for education in engineering, pharmacy, medicine, nursery and teacher)

Washington Accord

- Established in 1989 by 6 accreditation bodies for engineering education in Australia, Canada, UK, Ireland, New Zealand and USA
- Accreditation bodies (of WA signatories) accredit study programs with “similar” criteria
- Recognizes substantial equivalency of accredited programs under the Accord

Washington Accord membership

ABET (USA)
Engineers Canada
ECUK (UK)
EA (Australia),
EI (Ireland)
EngNZ (New Zealand)

Accreditation Bodies	Provisional Status	Signatory
6 Founding Members		1989
HKIE (Hong Kong)	No system at that time	1995
ECSA (South Africa)	1994	1999
JABEE (Japan)	2001	2005
IES (Singapore)	2003	2006
BEM (Malaysia)	2003	2009
ASIIN (Germany)	2003 but was removed in 2013	
ABEEK (RP Korea)	2005	2007
IEET (Chinese Taipei)	2005	2007
AEER (Russia)	2007	2012
NBA (India)	2007	2014
IESL (Sri Lanka)	2007	2014
MUDEK (Turkey)	2010	2011
PEC (Pakistan)	2010	2017
IEB (Bangladesh)	2011	
CAST (PR China)	2013	2016
PTC (The Philippines)	2013	
ICACIT (Peru)	2014	2018
CFIA (Costa Rica)	2015	2020
CACEI (Mexico)	2016	
ACREDITA CI (Chile)	2018	
PII (Indonesia)	2019	
COE (Thailand)	2019	
MEC (Myanmar)	2019	

International Engineering Alliance

https://www.ieagreements.org

Educational Accords			**Competence Recognition/ Mobility Agreements**			
Washington Accord	Sydney Accord	Dublin Accord	International Professional Engineers Agreement	International Engineering Technologist Agreement	Agreement for International Engineering Technicians	APEC Agreement
Professional Engineers	*Engineering Technologists*	*Engineering Technicians*	*Professional Engineers*	*Engineering Technologists*	*Engineering Technicians*	*Professional Engineers (Regional Agreement)*

Paradigm shift from input-based teaching to outcomes-based learning

In the 2000's, ABET (USA) drastically changed its evaluation method from input base to outcomes base. ABET triggered the world paradigm shift of engineering education from input-based teaching to outcomes-based learning. The Washington Accord adopted OBE methods for evaluation.

Study programs shall set up learning outcome, taking into consideration what students shall acquire rather than what professors wish to teach.

IEA Graduate Attributes

1	Engineering knowledge
2	Problem Analysis
3	Design / Development of Solutions
4	Investigation
5	Tool Usage
6	The Engineer and the World
7	Ethics
8	Individual and Collaborative Team Work
9	Communication
10	Project Management and Finance
11	Life Long Learning

Complex Engineering Problems

- Complex engineering problems cannot be resolved without in-depth engineering knowledge.
- They may need multi-disciplinary approach. They involve wide-ranging or conflicting technical, engineering and other issues.
- They need appropriate consideration for public health and safety, whole-life cost, net zero carbon as well as resource, cultural, societal, and environmental considerations as required.
- The complex problems may have several solutions or no solution.

Engineering Design Education

Design abilities to develop solutions to societal needs by applying science, technology and information:

- Ability to identify a problem that is expected to be solved
- Ability to identify restricted conditions such as public welfare, environmental preservation, and cost which are expected to be considered
- Ability to logically identify, organize, and investigate the problem that is expected to be solved
- Ability to establish a plan to solve the problem considering the restrictions and by applying body of knowledge of mathematics, sciences and technology in each applicable field
- Ability to actually solve the problem in accordance with the plan that is established

JABEE's Chronicle for Washington Accord

1997 Preparation committee

1999 Establishment of JABEE

2001 Started accreditations

2001 Provisional status

2005 Signatory status

2012 1st periodic review

2017 2nd periodic review

Shortcoming of Japanese Engineering Education identified by 2004 WA review team

Most Japanese engineering education is rooted in applied science. As a result, most Japanese engineering programs emphasize the learning of relevant scientific principles more than the application of those principles in a design context. The fourth year of such programs, for example, usually consists of a research project directed by a faculty member who joins the fourth-year students with his or her graduate students. This experience often lacks significant design content, leading the Japanese industries who employ new engineering graduates to accept the responsibility of training those new employees to perform engineering design.

In addition, Japanese faculty and students have long valued the freedom of each student to select a course of study and research that meets their individual educational objectives, leading to great flexibility in course selection within a typical student's years of study.

These two factors combine to make Japanese engineering education somewhat different from that found in many of the WA countries, although the end result is clearly a highly educated engineering graduate with excellent experience in research, although probably with little hand-on engineering design experience.

Comments made by WA periodic review team in 2012

- Recognized the improvement on Engineering Design Education
- “Multi-disciplinary” team work is not sufficient
- Internationalization (foreign students and teachers) not yet sufficient
- Education of communication skills in English not yet sufficient
- More industry’s participation to JABEE activities should be encouraged

Comments made by WA periodic review team in 2017

- Recognized JABEE’s flexible application of “Multi-disciplinary” team work in the Accreditation Criteria and in the Criteria Guide
- Evaluation of quality of program evaluators is not systematic

Negative attitudes to accreditation

- Educational institutions are tired with:
  - ✓ Self-evaluation
  - ✓ Institutional evaluation enforced by law
  - ✓ Program accreditation (JABEE)
- Unhappy with the attitude of some JABEE evaluators
- Doubt on advantages of accreditation
- Lack of importance of perception on third-party evaluation

"It was a good experience. We can do it by our own"

JABEE's measures

- Criteria revision in 2012
- Digital submission of self-review documents
- Continuous training of evaluators to avoid unnecessary workload to programs
- Symposia/seminars/consultations to change the Japanese culture vis-à-vis accreditation

"Accreditation is only a means. Leveling up engineering education is the purpose".

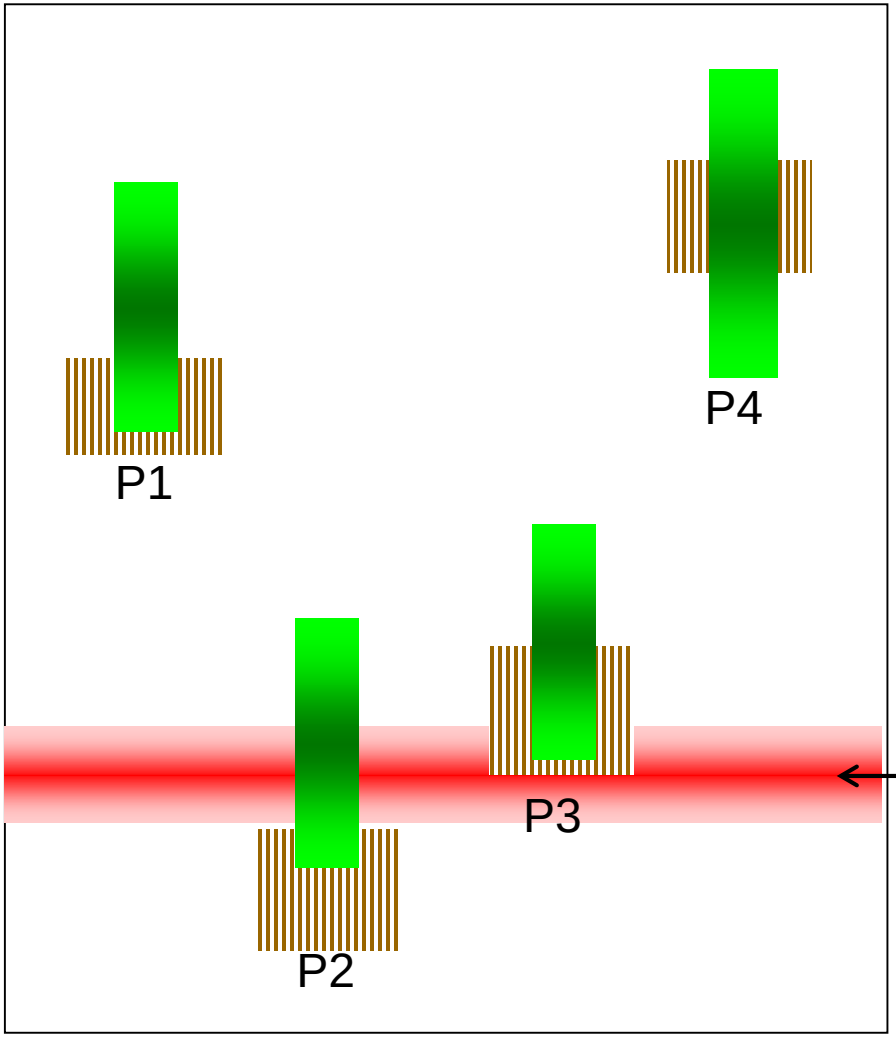
"Disseminate the Washington Accord philosophy"

"Translation into Japanese and dissemination of IEA GA&PC document"

"Disseminate the world trend of Accreditation of Engineering Education"

Why accreditation?

- Purpose is the improvement of education
- International equivalency (there is no value unless the level of education is recognized at international level)
- Review by the third party (self-evaluation is not sufficient)
- Accountability to the society
- Enhance outcomes-based education



Learning outcomes to be achieved

Knowledge and abilities of the graduates

Required level by the society

JICA Technical Cooperation Project in Indonesia

- 9 years from 2014 to 2023
- Establish IABEE (Indonesian Accreditation Board for Engineering Education)
- Develop accreditation criteria
- Develop program evaluation procedure and instruments
- Train IABEE experts in different countries (evaluator trainers training)
- Train evaluators in Indonesia
- Socialization to education institutions
- Conduct accreditations
- Provisional status in WA in 2019
- Signatory status in WA in 2021 (2022 due to COVID)

Oversea Accreditation

- ABET conducted oversea accreditations in the 158 HEIs (out of USA) in 41 countries, mainly in countries, who do not have an international level accreditation body.
- ABET states their attitude toward global accreditation “We will conduct an accreditation review in the MRA/MOU country/region only if our partner does not object.”
- ABET evaluates and accredits foreign country’s programs with ABET accreditation criteria. Evaluation is conducted in English.
- The needs of engineering differ from one country to another, doesn’t it?
- The Washington Accord does not recognize the substantial equivalency of oversea accreditation.
- The current WA Executive Committee proposes to revise the WA R&P to restrict oversea accreditation in WA members jurisdictions (countries or regions).

Oversea Accreditation

- The choice of accreditation bodies is the freedom of educational institutions.
- Oversea accreditation should not jeopardize the momentum of accreditation body in the jurisdiction (country or regions) of the signatories and provisional members of the WA.
- Oversea accreditation could be considered as additional value if educational institutions still wish to be accredited by foreign accreditation bodies.
- But if educational institutions seek for substantial equivalency under the WA of their programs, they should firstly be accredited by the country-based accreditation body.

JABEE's policy of Oversea Accreditation

- JABEE's policy of oversea accreditation is uploaded in the website (https://jabee.org/en/international_relations/other)

- In principle, JABEE does not conduct oversea accreditations.
- JABEE believes that country-based accreditation body is the most appropriate body for accreditation of engineering education in a country.
- JABEE wishes to support the initiative of a country of establishing an accreditation body and to assist them in getting a membership in the Washington Accord.

JABEE Oversea Accreditations in Indonesia under the framework of JICA project

2014	Department of Mechanical and Biosystem Engineering of Bogor Agricultural University
2015	Department of Civil Engineering of Islamic University of Indonesia
2016	Department of Metallurgical Engineering of Institute of Technology Bandung
2017	Department of Chemical Engineering of University of Indonesia

Thank you for your attention

aoshima@jabee.org