



## **ABET Accreditation of International Technology Programs - A Team Chair's Perspective**

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## Introduction

ABET has taken an active role in the global quality assurance process for technical education programs through numerous agreements with organizations worldwide<sup>1</sup>. These include Mutual Recognition Agreements and Memoranda of Understanding. ABET conducts an accreditation review outside the U.S. only with explicit permission from all applicable national education authorities in that program's country or region. In order to seek accreditation by ABET, programs outside of U.S. must have each appropriate education authority, recognition, or accreditation agency complete a request for approval form to be submitted with formal request for evaluation. The ABET accreditation process for programs located outside of the United States is identical to the accreditation process for programs within the U.S. ABET requires a program seeking accreditation in a country where English is not the native language must provide its program name both in English and in the native language. It also requires the English translation of the program name should be based on the technical content and not the literal translation of the program name so that ABET can designate the appropriate accreditation commission and determine the applicable criteria. ABET has started accrediting international technology programs through Engineering Technology Accreditation Commission (ETAC – Technology Accreditation Commission TAC before 2012) about eight years ago.

## Background

The author had the privilege to chair teams of evaluators to four international institutions seeking accreditations for their technology programs. All of the institutions, except one, had multiple programs. One institution had only baccalaureate level programs, one institution had only associate level program, and rest of two institutions had both baccalaureate and associate level programs. Medium of instructions in all the programs, except one in South America, were in English.

## Geographical and Program Diversity

A great diversity existed in the type of programs, number of programs and geographical location of the institutions. Programs ranged from manufacturing to aeronautics to chemical engineering technology. Geographically, one institution was in South America, two institutions in two different countries in Middle East, and one in South East Asia. One institution had one program and another institution had nineteen programs in five locations.

## Typical Institutional Profile

This South American institution was established in 1984 as a non-profit private educational institution. The mission of the institution is to develop people and organizations through education, training, and consulting. It offers professional programs related to the application of technology in design, supervision, operation, and maintenance of industrial sectors. It also offers

continuing education programs for engineers and technicians as well as consulting and research services for industry. The institution is recognized by the Ministry of Education of -- as an institution of higher education (Educación Superior), and authorized to offer programs of study leading to the Professional Technologist title.

This Middle Eastern industrial college is a state-owned institution under a Royal Commission. It was established in 1989 and was one of the first colleges of its kind in the region. The current enrollment of the college is around 3600 students. It is located in a planned industrial town. The college's mission is to prepare young citizens for technical and managerial positions for the local industries and for other private and public sector employers throughout the country.

This south east Asian polytechnic is a statutory board under the Ministry of Education, which was set up in 1992 to provide broad-based training for students inclined towards practice-oriented studies at tertiary level. This polytechnic is responsible to its own governing board called the Board of Governors. The Principal & CEO (PCEO) leads the Senior Management team which comprises Deputy Principals (DyPs), Directors, and Deputy Directors of Schools and Corporate Departments. The team is responsible for formulating, reviewing and implementing strategies, policies, systems and processes to drive polytechnic's mission to achieve its vision.

### Typical Program Profile

The Diploma in Aeronautical and Aerospace Technology in this south eastern polytechnic was launched academic year 2009/2010 by the School of Engineering in a response for a need for skilled technical personal to support the growing aviation industry in Singapore. The Diploma involves a three year course of study and is conducted during the day on campus. In the first and second years, the students take courses in basic engineering and general studies and in the third year they take more aerospace specific courses. The program is organized in a matrix format in which the Head of the Directorate which has primary responsibility for the program reports to the Director of the School of Engineering. Appropriate faculty members from the Directorate which supports the program and three other related Directorates. There are 14 core faculty and 87 students in the program. The first graduating class was in Spring 2013 and was comprised of 48 graduates.

The Plant Machinery Maintenance Technology program in this South American institute offers a curriculum in the field of mechanical engineering technology. The graduates of the program are prepared to work in a mechanical design, maintenance management, or project management within industry. The program educational objectives are as follows:

- Graduates analyze, design, implement and supervise modern mechanical systems; as well as manage maintenance of industrial plants.
- Graduates identify problems and opportunities for improvement, and they implement solutions applying modern technologies and appropriate procedures.
- Graduates manage resources and work with effectiveness, initiative, creativity, and within teams.
- Graduates are committed with lifelong learning, quality and safety.

- Graduates follow ethical principles and they contribute to the growth of the community. Typical employers are companies that manufacture steel, mining companies, dairy companies, beverage production, oil and gas service companies, and the airlines. Some of companies hiring graduates are LAN, Gloria S.A., ABB S.A., SN/Power, and Maestranza Diesel SAC.

The baccalaureate program in chemical engineering technology in this middle eastern industrial college is structured for a five-year duration consisting of a preparatory year, two specialization years for the associate degree program followed by another two years for the BS degree program. The number of graduates has increased from 26 to 58 over the last four years. Program graduates have taken up employment as chemical engineering technologists in process industries, including petroleum (ARAMCO, SAMREF, YASREF), petrochemical (SABIC Group, PETRORABIGH, NATPET), environmental protection (RCEPC), desalination units (MARAFIQ), and wastewater treatment plants (MARAFIQ).

The program educational objectives are that graduates will:

- possess the technical knowledge and skills needed for employment in jobs related to laboratory applications, analysis, design, control, technical support and supervision of chemical processes;
- have the understanding and commitment to protect the public interest, health, safety and the environment, and to maintain the highest ethical and professional standards towards employers and community during their professional career;
- recognize the need and engage in life-long learning activities through the pursuit of further studies, on-job training and certification; and
- reach professional success through working and communicating effectively within multidisciplinary team, solving real-world problems, and assuming leadership roles with integrity and high responsibility in their organizations.

### Common Theme of Excellence

All the institutions had some common approaches to accreditations. These are in spite of wide differences in educational and cultural backgrounds of the students and faculty. Even between the two institutions in the Middle East local cultural differences were prominent. First, technical core courses, mathematics and sciences were stressed irrespective of countries and degree level. All of the programs exceeded minimum accreditation requirements and stronger than most of the US domestic programs the author had reviewed (the author had the opportunity to review about twenty five institutions over the last eighteen years). All of them had very strong laboratory components. Most of the programs had excellent laboratory and physical plant facility. Overall faculty members were highly qualified and significant portion of the faculty members were trained in western countries. A number of faculty members were hired for technology programs because of their achievement in industry. Most of the programs provided adequate instructions and facility for public speaking and presentation skills. At most all the programs that offered English only instruction had one year of intensive English language training prior to entry in to the formal technology programs. One exception was where primary and secondary education was given in English. Some of the time technical faculty members were used for such instruction.

All of the programs had prepared excellent self-studies. The self-studies were in great details, well organized, and followed ABET suggested outlines. Often they included charts, tables, graphs, and flow charts. Most of the assessment and evaluation plans were acceptable. All of the programs had excellent industry support. Industrial advisory committee members were actively involved with the faculty members and students. All of the programs had excellent placement records. Employer representatives were very happy with the programs and the graduates were valued by the employers. Many of the programs were already recognized or approved or accredited by various European professional organizations. Many programs had collaborations with one or more Western or United Nations' organizations.

### Common Areas of Improvement Needed

Most of the programs offered little flexibility of courses in technical areas. Most of the programs were lacking serious instructions in social sciences and humanities at the college level. Awareness of world current events, except for narrow regional knowledge, and appreciation for diversity were often lacking among the graduating seniors. It appeared that the programs often sacrificed critical and free thinking to train graduates in deep technical knowledge. Some used course grades for evidence of achievements of student outcomes. Like many US domestic programs, real purpose of assessments were not clear to many of the programs. Most of the programs had collected more than needed data. However, many faculty members were not involved in planning and execution of assessment process and were unaware of significance of assessment. Thus they thought much of the assessments exercise onerous and unnecessary. Because of these, continuous improvement process was often incomplete and neglected

### Comparison with U.S. Domestic Programs

As for the technical competency of the graduates, the international programs were either at par or above any comparable U. S. domestic programs. Students appeared to be better prepared when they started technology programs than most U.S. students entering technology programs. They appeared to be more serious and focused students. Very few students transferred from a different major as more students change major in U.S. However, graduates from the international programs seem to know less about other cultures and country. Faculty members overall had more experience in industry, but many lacked terminal degree in technical field.

### Conclusion

With overall superior programs and high graduate placement, author and other members of the team wondered why these international programs seeking ABET accreditation. Most common response received was "prestige" to be accredited and affiliated with ABET. International recognition and mobility of the graduates were cited other reasons.

### Bibliography

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2. Criteria for Accrediting Engineering Technology Programs [www.ABET.org](http://www.ABET.org)
3. Accreditation Policy and Procedure Manual [www.ABET.org](http://www.ABET.org)