

The Role of Program Advisory Board in Elevating the Degree Program Content

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Abstract

Many academic institutions outside the United States have become an ABET accredited programs over the past decade, and many more are expressing interest in becoming one. Alike their counterparts in the United States, ABET-accredited engineering programs must maintain and adapt curricula, student outcomes and educational objectives that reflect and respond to the needs of industry and the engineering discipline seeking accreditation. For engineering programs with little prior knowledge about ABET and its requirements, including defining the program constituencies, collecting data and acquiring systematic feedback, and interpreting outcomes are often challenging. Although a large number of engineering programs outside of the United States established an advisory board for their respective programs, there are not many reports published to show how the programs have capitalized on and benefited from the wealth of knowledge and experience collectively exist in this group.

The Petroleum Engineering Program at Texas A&M University at Qatar (TAMUQ) recently conducted a survey and collected information for its Advisory Board. The Petroleum Engineering Advisory Board comprises of nineteen members with high visibility and prominent leadership positions in their respective organizations. This paper reports on the data collected through this survey and key suggestions made by this distinguished group of leaders to further improve the program's impacts.

Keywords

Advisory board, ABET, Engineering Curriculum, Continuous Improvement, Accreditation

1. Introduction

Texas A&M University at Qatar strives to offer students the highest quality engineering education. The Petroleum Engineering Program become a premier provider in the area, graduating engineers of exceptional quality. Like others, the program constantly evaluate our outcomes and work towards continuously enhancing our learning offers to the

student and for the benefit of future employers. Advisory board identifies opportunities for continuous improvement of the undergraduate program curriculum, based on oil and gas industry experience with graduates and alignment with current and anticipated future industry needs. Reflecting on the current offers and clear feedback from faculty, students, and advisory board, the program also feel the need to equip better the students with some of the non-technical skills that had better prepare them for the workplace. Successful students require not only excel within their disciplines, but also have the ability and propensity to engage in cross-disciplinary work, communicate effectively with multiple audiences, and work alongside professionals in different fields.

2. Continuous Improvement in Curriculum and Workplace Skills

Texas A&M University's College of Engineering strives to provide its students with a high-quality education that will prepare them for a wide range of careers at the forefront of the engineering field. The curriculum is designed to accomplish this by closely integrating cutting-edge basic and applied research with innovative classroom instruction. Petroleum Engineering is primarily concerned with the safe and economic extraction of oil, gas and other natural resources from the earth. This is accomplished through the design, drilling and operation wells and well systems, and the integrated management of the underground reservoirs in which the resources are found. The curriculum includes study of:

- Design and analysis of well systems and procedures for drilling and completing wells.
- Characterization and evaluation of subsurface geological formations and their resources.
- Design and analysis of systems for producing, injecting and handling fluids
- Application of reservoir engineering principles and practices for optimizing resource development and management
- Use of project economics and resource valuation methods for design and decision making under conditions of risk and uncertainty.

The advisory members of petroleum engineering program are carefully selected from among companies located in Qatar; boards represent key industry stakeholders such as experienced industry leaders, senior alumni (former students), and employers of graduates. The board members are a diverse mixture of Qatari nationals and expatriates from around the world with impressive representation of female engineers. The board members are aware of their responsibility and the university's expectations by meeting twice a year, participating in senior design projects by identifying projects for eligible students, attending the final presentations of senior projects, meeting with students and conduct exit interviews, and actively participate and be informed of ABET requirements. The board members support the program to develop 'a knowledge-based economy as mandated by leaders of the State of Qatar' thru building human capacity as one of the country's main pillars to achieve on the strategy development goals and meeting the country's demand for technical expertise. The board strategically involves in assessing future needs of the program.

The advisory board conducted survey and collected information from alumni who have completed at least three years on the job post-graduation, recent graduates, supervisor, and mentors of recent graduates, and among the board members. The key improvement themes for these initiatives are:

- Enhance integration across subjects – "bringing it together."
- Increase practical and industry experience opportunity

As additional, some skills areas that the board highlighted as important for entering the workplace, such as:

- Business communication (writing emails, reports, public speaking, presentation skills, phone calls, meetings) and interpersonal communication and listening skills (dealing with others, exchange of information with colleagues, cultural tolerance, respect of others, carefully listening and hearing messages and tasks, etc.)
- Understanding Accountability
- Time management (punctuality with working hours and project/task deadlines; multi-tasking and managing to complete tasks in a timely manner under pressure)

3. Conclusion

Active participation of the program advisory board should raise their confidence in the program graduates' job preparedness. Program assessment and feedback loops allow programs and the board members to meaningfully participate in program assessment and develop essential input for the program. The program should consistently ask for their input regarding curricula, senior design projects, and students' experiential learning.

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Biographies

Dr. Albertus Retnanto is Professor of the Practice of Petroleum Engineering at Texas A&M University at Qatar and has been in the Petroleum Engineering program since 2009. He received his Ph.D. degree in Petroleum Engineering (1998) from Texas A&M University. He teaches undergraduate courses in numerical methods, well testing, petroleum production system, production engineering, petroleum technical presentation, natural gas engineering, and integrated asset development and makes significant curriculum enhancements to several courses. He held a Principal position with Schlumberger and has more than 18 years of experience worldwide in both technical and management positions in the area of well testing, field development, and production enhancement. He has received the Performed by Schlumberger Bronze Award four times. He has served as the Review Chairman of SPE Drilling & Completion Journal and chair on several committees on SPE. He received the A Peer Apart SPE Award, which is dedicated to the technical excellence of authors to the industry. He received the AFS College-level Distinguished Achievement Award in Teaching in 2016, SGA Educator Award, SEC Best Faculty Award, and the Faculty of the Year Award in five times, and the Distinguished Teaching Award. He has authored and co-authored over 35 papers. He is a PETE undergraduate advisor, and ABET/SAC coordinator. He serves as an ABET Program Evaluator (PEV) for the Engineering Accreditation Commission representing the Petroleum Engineering.

Dr. Hamid R. Parsaei is a Professor of Mechanical Engineering at Texas A&M University at Qatar (TAMUQ). Additionally, he holds the rank of professor in the Department of Industrial and Systems Engineering and Department of Mechanical Engineering at Texas A&M University in College Station, Texas. Dr. Parsaei is a fellow of the Institute of Industrial and Systems Engineers (IISE) and the American Society for Engineering Education (ASEE). He is a leader in advancing teaching and learning by developing new initiatives for using technology in the classroom and enhancing excellence through diversity in educational programs. He has been a frequent speaker at national and international conferences on engineering education and the use of technology to further improve teaching and learning. His research currently focuses on application of optimization techniques to emergency evacuations and disaster mitigation. He has published over 280 articles in the peer reviewed journals and conference proceedings. He has authored and edited 24 text and referenced books including those in progress. He has served as an ABET Program Evaluator (PEV) for the Engineering Accreditation Commission representing the Institute of Industrial and Systems Engineers since 2006. He has served as the college wide ABET Coordinator at Texas A&M University at Qatar. Dr. Parsaei served as professor and chair of the Department of Industrial Engineering at the University of Houston (January 2001- August 2010) and Associate Dean for Academic Affairs at Texas A&M University at Qatar (September 2010-August 2014). Dr. Parsaei is a registered professional engineer in Texas.

Boback Parsaei holds B.S. and M. Engr. in Civil Engineering from Texas Tech University and Texas A&M University, respectively. He has served as a senior consultant with Integrated Technology Systems, Inc. He is co-editor of the CRC Press book series on Technology Guides: Advancing Capacity Building in Contemporary Organizations and co-author of an upcoming CRC Press book, Leadership Excellence in Dynamic Organizations: The Art of Developing Leaders. Mr. Parsaei has presented several papers at international conferences on leadership, project management, and engineering education. He is currently a doctoral candidate in the Department of Civil and Environmental Engineering at Texas A&M University.