

Humanitarian Engineering Initiative of Texas A&M University at Qatar; A Case Study of a Series of Successful Workshops to Enhance the Sense of Social Responsibility of Engineering Students

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Abstract

The Humanitarian Engineering Workshop is an initiative started by Texas A&M University at Qatar (TAMUQ) in collaboration with University of Groningen Campus Fryslan, Globalization Studies Groningen, the Network on Humanitarian Action (NOHA) Groningen, and the Centre for Innovation / Leiden University since 2016. The workshop is conducted over a week in May each year, and so far, four successful workshops have been completed. Up until now, nearly 90 TAMUQ students have participated in these workshops. The one-week experience is truly unique for TAMUQ engineering students who need to collaborate with graduate students enrolled in Groningen's MA in *Humanitarian Action* from all over Europe, Asia and Latin America. The experience allowed our students to understand the many complications involved in reconstruction work in post crises. Students work in teams comprising people from different professional backgrounds, enforcing cooperative learning across disciplines.

The workshop is designed to provide instruction from experts in the fields of humanitarian aid and innovation, sociology, socio-linguistics, politics, education, data analysis, engineering, sustainability and risk management, blockchain technology, and more. The primary modes of instruction involve open ended discussions, integrated learning, cooperative learning, and systems thinking. Students work together in groups with people from the various participating organizations in teams to work on their final rapid prototyping projects.

Instructional topics in the workshop include:

- Principles of Humanitarian Action and Engineering
- Professional Ethics in Engineering and Humanitarian Action.
- Advanced Scenario Planning – Manoa Technique
- Human Constraints in Decision Making: Game Theory

- Understanding social impacts of the earthquakes in Groningen
- Food Security, Disaster Risk Reduction and Preparedness
- Understanding sustainability versus security
- Protecting the Environment in Industrial Projects such as in the Oil and Gas Operations
- Cultural Determinants of Resilience in Disasters and Inter-cultural communication
- Rapid Prototyping in Humanitarian Innovation

Learning outcomes of the workshop include:

- Ability to formulate proposals for complex humanitarian problems
- Understanding of ethical, cultural, and social issues in Humanitarian Work
- Appreciation for the complex and ill-defined problems in humanitarian work
- Communication skills to develop culturally sensitive and well-reasoned arguments
- Scenario building for Humanitarian programming and Rapid prototyping

This paper aims to provide a comprehensive report on the aforementioned workshop, as well as conduct a literature review on other Humanitarian Engineering programs existing in universities and organizations abroad.

Keywords

Humanitarian engineering, Workshop, Education, Humanitarian aid and Engineering.

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Biographies

Sara Amani is PhD Student at Texas A&M University. She is working on obtaining her degree in interdisciplinary engineering, with a specific focus in engineering education.

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Hassan Bashir is an Associate Professor at Texas A&M University at Qatar. His research interests included Humanitarian Engineering and Comparative Political Theory.

Mahmood Amani is an Associate Professor of Petroleum Engineering at Texas A&M University at Qatar. In addition to his academic activities, he also conducts Industrial Training short courses for the Oil and Gas Professionals.