Pursuing Intentional Design of Global Engineering Programs

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Motivation: Why study engineering?

Engineering problems and projects are increasingly global in scope.
Engineers will need to collaborate with people from around the world.
Engineering education does not traditionally offer opportunities to learn global skills.

Guiding Question: How can we design effective global experiences for engineers?

Assessing Global Engineering Competency

Prior Work
- GEC Framework was developed through case studies and interviews with practicing engineers.
- To assess these skills, 6 scenario-based questions were developed from the interviews.
- An initial validation analysis was conducted with practicing engineers.

Participants
- 100 students who have studied abroad in China
- 100 students who have studied abroad elsewhere
- 100 students who have not studied abroad

Methods
Survey including the 6 GEC scenarios, GPI, CQS, Chinese culture questions, personality inventory, and demographic questions.

Compare across student groups and compare to the existing data from practicing engineers.

Study One

Exploring the Influence of Program Destination on Learning

Rising Sophomore Abroad Program
Spring semester 3-credit general education course on Global Engineering Practice

Two-week trips abroad: visiting companies, universities & cultural sites

2018 Participants: 155 students across seven tracks

Case Studies: Comparing Across Tracks
Using Hofstede’s model of national culture, we will group tracks based on cultural distance from the US:

Low: Australia, New Zealand, UK/Ireland
Mid: South Africa, Europe
High: China, South America

Methods
Mixed-methods analysis: QUANT → QUAL → Mixed

Quant: Global Perspectives Inventory (Pre/Post)
Qual: Reflective Journals
Mixed: Characterize tracks with themes/trends

Analysis: Compare tracks within and across groups

Study Two

Identifying Global Experiences that are Significant to Students

Prior Work
- Recent focus on intervention-based program design and intercultural competence assessment
- Critiques suggest a need to learn more about student experiences and other learning outcomes

Participants
- 20-30 students from short-term programs
- 20-30 students from research abroad programs
- 20-30 students who spent a semester abroad

Methods
Critical-incident technique interviews used to explore a few key experiences for each student through in-depth descriptions.
Three rounds of coding will be used to identify themes and characterize groupings of incidents to distinguish significant types of experiences.

Study Three