Developing a Global Engineer

What is Cultural Intelligence?
The “Global Engineer” Curriculum and Tools to Create Culturally Diverse Students

Sally Conant
Global Co-op Coordinator | College of Engineering | Northeastern University
My Role at Northeastern

**Global Co-op Program**
College of Engineering

- Advise undergraduate & graduate students interested in co-op abroad
- Facilitate application process to international positions and market student to the global workforce
- Prepare students for work abroad through culture, language, and workplace difference material
- Develop and manage partnerships with international employers

**Co-op Coordinator**
College of Engineering

- Teach “Intro to Coop” professional development courses to prepare second year engineering students for co-op
- Curriculum includes:
  - Resume & Cover letter
  - Applying to appropriate positions
  - Interview preparation
  - Professional expectations in the workplace
  - Goal setting & Reflections
  - Looking forward to integrate co-op work experience into academic and professional trajectory
- Develop global co-op curriculum to promote global context and mindset and share with co-op team
Overview

• Global Engineering
• Cultural Intelligence
• Why is this Important?
• Global Engineer Curriculum
• Opportunities at Northeastern
How is Engineering Global?

- Diverse workforce
- Multinational corporations & teams
- Global markets & overseas competition
- Outsourcing products/manufacturing
- Research collaborations
What is a “Global Engineer”? 

A global engineer is defined as one who has the personal qualities, international knowledge, and technical skills required to work effectively in a range of international settings and diverse environments.
Cultural Intelligence

Cultural intelligence (or Cultural Quotient - CQ) can be understood as the capability to relate and work effectively across cultures.
Cultural Competencies

The most important cultural competencies for engineering graduates according to an industry poll:

• Can appreciate other cultures- avoids ethnocentrism
• Is able to communicate across cultures
• Is proficient working in or directing a team of ethnic and cultural diversity
• Can effectively deal with ethical issues related to cultural differences
• Has had a chance to practice engineering in a global context
• Cultural, social, and political awareness
Why Is Developing a Culturally Intelligent Engineer Important?

• It’s what employers are seeking in candidates

• It prepares students to face the challenges of the 21st century
Skills Employers Seek

- Innovation & Creativity
- Teamwork & Collaboration
- Communication
- Adaptability and openness to foreign cultures
- Analytical & Interpersonal Skills
- Critical thinking & Problem Solving

Copyright ©2018 American Society for Engineering Education
Diversity in the Workplace

Diverse teams:
• Make better decisions
• Outperform homogeneous teams
• Offer new perspectives
• Make more money

“One in five American jobs is tied to global trade and that number is expected to rise significantly in coming years” - The U.S. Department of Labor
21st Century Grand Engineering Challenges

Engineer better medicines
Reverse-engineer the brain
Prevent nuclear terror

Secure cyberspace
Enhance virtual reality
Advance personalized learning

Engineer the tools for scientific discovery
Provide energy from fusion
Make solar energy affordable

Develop carbon sequestration methods
Manage the nitrogen cycle
Provide access to clean water

Restore and improve urban infrastructure
Advance health informatics

National Academy of Engineering
We educate the next generation of engineers to tackle these challenges, but they often lack the cultural intelligence to do so.

According to the U.S. Department of Education:

“Students who study a different part of the world, speak a second language, or study abroad, have a better appreciation of the complexity, challenges, and ambiguity, as well as the opportunities, of life in the 21st century.”
Global Engineer Curriculum
Learning Outcomes

• Students will understand that engineering is a global profession—whether they travel for work, have international teams, or collaborate with diverse engineers from across the globe.

• Students will recognize the need to develop cultural intelligence—the skills to succeed in the global job market—and they will be able to apply the course content to global engineering settings.

• Students will be prepared to fulfill Northeastern University’s mission “to create and translate knowledge to meet global and societal needs.”
Lesson Plan

Time: 30-45 min

Procedure:
• Opener/Game
• Global Engineer Discussion
  • Why is this Important?
  • Recent article to illustrate idea
• Cultural diversity lesson
• Student panel

Required:
• Global Engineer PowerPoint
• GlobeSmart Profile
• Cultural Intelligence video
• Whiteboard or large paper for notes
• Student Volunteer(s)
Working in Unfamiliar Surroundings

What follows are simple arithmetic problems. Therefore, it should be easy for you to get the correct answers.

However, you are in a different country and the symbols for multiplication, addition, division, and subtraction follow a different logic.
- Means to multiply
+ Means to divide
\[8 - 2 = 16\]
\[12 + 4 = 3\]
\[4 \times 3 = 1\]
\[6 \div 2 = 8\]
\[9 + 3 = 3\]
\[7 \times 4 = 3\]
\[4 - 2 = 8\]
\[8 + 4 = 2\]
\[12 \times 2 = 10\]
\[20 + 10 = 2\]
\[9 + 1 = 9\]
\[5 - 6 = 30\]
\[2 \times 1 = 1\]
\[10 + 5 = 2\]
\[12 - 2 = 24\]
\[6 \div 3 = 9\]
\[8 - 5 = 40\]
\[6 \div 6 = 12\]
\[17 \times 2 = 15\]
\[14 - 7 = 98\]

\[\div \text{ Means to add}\]

\[\times \text{ Means to subtract}\]
Cultural Diversity

Culture

Values

Communication
Culture

- The ways of living that a group of people has developed to assure its survival in a particular physical and human environment
- Attitudes, customs, values, communication
- Dynamic, not static
- Has its own definitions of right & wrong/good & bad
- Each culture thinks its own ways are superior (ethnocentricity)
Iceberg Model of Culture
Cultural Behaviors

- A person arrives to meet you 30 minutes after your scheduled meeting time.
- A person throws a stone at a dog.
- A student helps another student answer a question during a test.
- A supervisor raises their voice in front of the team when you did not complete the project to their satisfaction.
- A person cuts in front of you in a line.
VALUES

• Principles or qualities that a group of people tend to see as good, right, worthwhile
• Consciously or unconsciously held
• Values across groups may differ, but are appropriate for meeting the needs of a particular group
• Same value may manifest itself differently in two cultures
• The values we hold influence our perception of things
Communication

• How we give and receive information

• Communication also involves a context. Being unaware of the cultural and situational context may result in miscommunication and misunderstanding.

• Direct---Indirect continuum

• Can be categorized as verbal or non-verbal

• Stereotyping
Lost in Translation

Tekst polski
Toe to Toe
Global Options at Northeastern

Short term service learning trip
One week- 10 day opportunities

Dialogue of Civilizations
Led by Northeastern faculty

Semester study abroad/ NUin

Global Co-op
Northeastern Global Experience Growth Rate

- 66% of students have at least one global experience
- University mission to increase to 100% by 2025
Employer & Student Perspectives

“Working at Star and in China has truly been an amazing experience. After living in China and working with an international team, I have learned so much about other cultures and have made lasting friendships.”

- Kaelan Lee, ME 2016, Star Prototype, China

"We feel extremely fortunate to have had the opportunity to collaborate with the NEU Co-op program since 2014. The program provides an exceptional platform for the students to take on real responsibilities at our company and spearhead initiatives that have a lasting effect on our business.”

- Steve Piro, CEO, Synergy Efficiency Solutions, Bali, Indonesia
The Value of Time Spent Abroad

- Flexibility
- Patience
- Agile & adaptable
- Enhanced creativity
- Fresher ideas
- Empathy
References


• National Academics of Sciences, Engineering, Medicine

• The American Society for Engineering Education (ASEE) Corporate Member Council (CMC)

• Workplace Diversity. www.linkedin.com/pulse/just-having-people-who-look-different-isnt-enough-create-scott-page/?trackingId=5Vav8AipF6U1vQvCn%2FocLQ%3D%3D.
Questions?
CQ Drive
Your level of interest, persistence, and confidence during multicultural interactions

CQ Knowledge
Your understanding about how cultures are similar and different

CQ Action
Your ability to adapt when relating and working in multicultural contexts

CQ Strategy
Your awareness and ability to plan for multicultural interactions

Cultural Intelligence

Session CEED 442
Proceedings of the 2018 Conference for Industry and Education Collaboration
Copyright ©2018 American Society for Engineering Education