Engineering Globalization - Oxymoron or Opportunity

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Overview

- Globalization vs. Localization
- Meanings of globalization for engineering education
  - Descriptive
  - Normative
  - Transformative
- Conclusions
Engineering as a *localizing* activity

- Methodological localization – simplification of problems
  - Isolation
  - Reduction in scope
  - Reduction in complexity

- Objective localization – uniqueness of problems
  - Specifications
  - Concreteness
Contradiction?
Globalization vs. Localization

- What might *engineering globalization* mean for engineering education?
- “What do we mean when we say that engineers should have a ‘*global understanding*’” – Lohmann
- Are multiple meanings possible?
Globalization describes an real, ongoing socioeconomic process.

Does not affect the localizing nature of engineering activity; it just enlarges the set of locales.

Education responds by providing engineers with particular skills and knowledge needed to work in these locales:

- Languages, laws, customs, resources, etc.

Educational objectives: enhancing the instrumental utility of engineers; adapting to the market needs of employers.
Globalized engineering practice involves cultural exchanges.

The descriptive reality of globalization is predominated by competitive exchanges.

Whose values get promoted in exchanges?

Technologies are “apt to reflect important characteristics of the societies that create them, including their values” – McGinn

Engineering education in advanced industrialized nations prepares graduates to work in advanced industrialized economies (related problem of “brain drain”)

Normative meaning
Transformative meaning

“...our generation will be judged by History for its ability to confront the two fundamental problems of our times: soul-destroying and socially destructuring poverty and the increasingly worrying environmental problems...then...universities should not only adapt to ‘market necessities’ but also to the main necessities of people on the whole earth” – Josep Xercavins i Valls
Transformative meaning: an opportunity?

- Humanitarian Engineering?
  - Broad knowledge of “low tech”, basic technologies for energy, infrastructure, agriculture, healthcare, ecology
  - Knowledge of international political, economic, and sociological issues
  - Themes of appropriateness, sustainability, and justice

- Educational objectives:
  - Producing graduates capable of addressing pressing global socio-technological problems
  - Attracting a new type of student into engineering
Transformative meaning: conclusion

- New type of engineering program
- Broad-based education, both technically and non-technically
- Targeted toward basic human needs, rather than the engineering job market
- Requires a more divergent and global perspective than traditional engineering