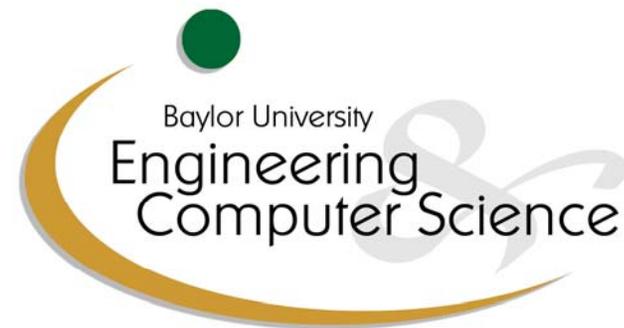


Engineering Globalization - Oxymoron or Opportunity

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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?

Descriptive meaning

- *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

Normative meaning

- 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”)

Transformative meaning

- “If...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