Making the Soft Side of Engineering Harder

Kevin M. Passino
Dept. Electrical and Comp. Eng.
The Ohio State University
"Soft"? ABET Criteria 3(c,f,h)

- (c) an ability to design a system, component, or process to meet desired needs **within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability**

- (f) an understanding of **professional and ethical responsibility**

- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
Impact of the soft-side

- Products, processes
- The public
- Social justice
- Respectability and development of the profession
Curricular, classroom (theory)

- Undergraduate engineering ethics education:
  - Excellent resource materials!
  - A few lectures in a design course?
  - Ethics across the curriculum?
  - Dedicated course (1 or 3 credit hours)?
  - Reliance on others (STS, Philosophy)?

- Graduate engineering ethics education (e.g., above + research ethics)
Design, Laboratory, Community (practice)

- Design projects, service-learning (e.g., EPICS)
- Service-learning (curricular) vs. engineering student service organizations (extracurricular)
- Interdisciplinary?
Engineering volunteering

- EWB, ESW, EPICS, ECOS, ...
- Highly interdisciplinary
- “Community-based learning”
- A generation of volunteers!
- Anecdotal: More women, good GPAs!
- A bunch of “do-gooders” solving the world’s problems?
The Ultimate Challenge

- Integrating scholarship and research enterprise into delivery of community service
- Finding a **global health** focus
- Science, engineering, and technology *can* help promote social justice
Needs, solutions, successes
More needs, solutions
Culture
Simple needs
Demanding needs
Current initiatives...

- Teaching Engineering Ethics Consortium (TEEC) development
- Science, Engineering, and Technology for the Developing World Project
- PhD student international service learning (workshops, low-cost lab development, educating global faculty)
Conclusions

- “Soft side” is hard (challenging), important, and interesting
- Generally, curricula are lacking (in content, focus)
- Extracurricular approaches provide valuable educational experiences
- Long term impact on academia? Industry? Community?