



Engineering 110/210:

Perspectives in Assistive Technology

Community Service and
Engineering

Kelly V. Beck

Science Outreach Director



Goals

- Explore principles of ethical and effective service and the application of these principles in engineering partnerships
- Explore the relationship of engineering analysis and public service reflection



Overview

- Introductions
- What is service?
- Motives
- Engineering practice vs community service practice
- Needs and assets in service partnerships
- Principles for ethical & effective service
- Reflection



What is Service?

- Respond to local science & technology reporter's request to be interviewed for tech article
- Do research that is directly related to a critical health concern like AIDS or critical environmental problem like global warming
- Using your skills to help a local non-profit, such as a civil engineering student/professor working with Habit for Humanity on weekends
- Give a "Mr. Wizard" science show presentation at your local elementary school every year
- Help a science & technology museum design an exhibit in your area of expertise
- Write a science / engineering book for the lay public in your area of expertise
- Create research internships for high school students in your laboratory
- Tutor for Chem 31 or Math 51



What is Service?

- Write a letter to a congressional leader about an issue related to science or technology
- Take time off from your studies, research, scientific career, to be a technology advisor to a government official
- Be a mentor in a weekly robotics club for kids
- Serve as a science advisor to a curriculum developer who is writing elementary or high school science curriculum
- Donate \$50 to National Institute on Disability and Rehabilitation Research
- Partner with an elementary or high school teacher by visiting the classroom once a week
- Use your course work to help a local community, i.e. use your class project on water quality to sample local water supplies and provide data to local city government
- Read all of the weekly science section in the newspaper



- Examples of Good Service
 - 1
- Examples of Bad Service
 - 1



What are the motives?

Why merge public service and
engineering?

- Better prepare engineers-in-training with real-world problems
- Social Context
- Altruism



"Social context can be defined as those elements of social life that help us determine the type(s) of interaction that develop or are expected in particular situations. From this definition, we can see that technology as an element of social life is able, in many instances, to determine the types of interaction possible in various social and cultural situations."

F. De Rego, Jr., C. Zoltowski, L. Jamieson, W. Oakes Teaching Ethics and the Social Impact of Engineering within a Capstone Course, Proceedings of the 2005 Frontiers in Education Conference, Indianapolis, IN, October 2005.



“While educators seek to provide learning environments that prepare students for life as engineering professionals, not-for-profit organizations – such as community service agencies, schools, museums, and local government offices – face a future in which they must rely to a great extent upon technology for the delivery, coordination, accounting, and improvement of the services they provide to the community. They often possess neither the expertise nor the budget to acquire or design a technological solution that is suited to their mission. They thus need the help of people with strong technical backgrounds.”

E. Coyle, L. Jamieson, and W. Oakes. International Journal of Engineering Education Vol 21, No. 1, Feb. 2005, pp. 139-150.



An Engineering Design Process

- Project Identification
- Specification Development
- Conceptual Design
- Detailed Design
- Production
- Service / Maintenance
- Retirement or Redesign



Community Partner Reflection Exercise

1. Summarize the task (s) your project partner is asking you to perform.
2. How do these tasks relate to or advance the mission of your project partner?
3. How would you describe the response of your team to the project partner's concerns at this meeting?
4. Summarize your project partner's mission in the community. (e.g., What community issue is your project partner attempting to address?)
5. Describe your participation at this meeting.



Source for community partnership reflection exercise:

L. Slivovsky, F. DeRego Jr., C. Zoltowski, L. Jamieson, and W. Oakes, California Polytechnic State University/Purdue University. *An Analysis of the Reflection Component in the EPICS Model of Service Learning*, Proceedings of the 2004 ASEE Annual Conference, Salt Lake City, Utah, June 2004.