Engineering Volunteerism

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Outline

- Volunteerism is required? for engineering professionalism
- Universities are responsible for development of the profession
- Educating the volunteer engineer is a university responsibility:
  - Strategy 1: Expand ethics and professionalism treatment
  - Strategy 2: Hands-on volunteerism via a student organization
- Relations to community-oriented design projects via service-learning (another important strategy)
- Infrastructure development for the volunteer engineer is a significant challenge
Strategy 1: Expand Ethics and Professionalism Treatment

- How to augment typical textbook treatments…
- Profession: “Pursuit of a learned art in the spirit of public service” (ASCE)
- Webster’s Dictionary: “... a kind of work which has for its prime purpose the rendering of a public service.”
- Public service is a critical part of being a professional!
Two routes to public service

- Employment + Service to Profession: Competence (“go the extra mile” to do good work), service to colleagues, service to profession, etc.

- Community service: Charitable organizations, disadvantaged groups, non-profits, educating public about profession, etc.

- Are both required? For the profession, yes?, for the individual not always.
Codes of Ethics

- Roles of codes? Ideals? Guidance?
- Role of “service” in codes, comparative:
  - **NSPE:** “Engineers shall seek opportunities to participate in civic affairs; career guidance for youths; and work for the advancement of the safety, health, and well-being of their community.”
  - Others with *similar* statements: ASCE, ACM/IEEE Software Eng. Code
  - Others have *weak/no* statements: AIChe, ASME
  - **IEEE:** *Nothing with respect to the community!*
- We need changes!
  - *Encourage, support, set group expectations,...*
  - *Must prominently state our ideals!*
Comparative professionalism

- AMA: “A physician shall recognize a responsibility to participate in activities contributing to the improvement of the community and the betterment of public health.”

- ABA: “... Every lawyer has a professional responsibility to provide legal services to those unable to pay. A lawyer should aspire to render at least (50) hours of pro bono publico legal services per year.”

- Is there a pervasive “pro bono” spirit in engineering???
  - Existing student volunteer activities (e.g., SWE, Tau Beta Pi, etc.)
  - Existing practicing engineers’ volunteerism (tutoring, etc.); identified as engineers? Do engineers view their services as essential?
Moral frameworks

- Utilitarianism, rights/duty ethics, virtue ethics all support volunteerism?

- Community-oriented version of self-realization ethics:
  - Promote professional development via integration of work and personal integrity
  - Company supports engineer in service, engineer develops loyalty to company
  - Need strong corporate citizenship programs!
Global Issues, World-Wide Communities...

- Community design constraints (must teach this!)
  - Know needs of community, get community involved, use local talent
  - Appropriate technology, technology transfer, safety
  - Cost, maintenance, and improvement
- Environment (sustainable development)
- Cultural exchange (efficiency vs. relationships)
- Globalization (learn about the competition)
- We need to educate “Global Citizens”
Ethics/professionalism assignments

- *Paper* design project (proposals) can be useful (e.g., scenarios that involve community design constraints, global issues)

- Research papers
  - Corporate citizenship program assessment
  - Survey of engineering volunteerism projects
  - Assessment of professional codes of ethics
Strategy 2: Hands-On Volunteerism Via a Student Organization

- OSU Engineers for Community Service (ECOS)

- Related organizations:
  - Engineers without Borders, USA, Univ. Colorado, Boulder
  - Engineers for a Sustainable World, Cornell Univ.
  - Engineering Projects in Community Service (EPICS), Purdue University +
  - ETHOS, Univ. Dayton; Engineering World Health, Duke Univ.
  - Chapters + others...

- Prime determinant of success - Students
Mission

- Engineers for Community Service (ECOS) promotes life-long professionalism via educational experiences in the uses of engineering skills for local and international community service projects.
ECOS is a College-Wide “Umbrella Organization”

- Advisory Board with faculty and staff
- Seminar series (e.g., service project examples)
- Multiple parallel projects in progress across College of Engineering:
  - ECOS web: http://ecos.osu.edu/ for project descriptions
- Key challenge: High-tech vs. “grunt work”
Volunteerism project ideas

- Drinking water filtration, waste treatment (low cost, effective yet without adverse environmental impact)
- Agriculture (improve yield, irrigation)
- Low-cost housing (local materials, portability for refugees)
- Electricity generation, wind and solar power, solar cooker, lighting (renewable energy sources, low-cost solutions to basic needs)
- Computer technology (education support, career-development)
- Communications technology (promote democracy, market price information)
- Medical technology, telemedicine (promote healthcare access and quality)
Current Projects

- Columbus/Domestic:
  - TechCorps, Ohio: Technology for disadvantaged schools
  - OSU FIRST robotics
  - Notre Dame Alumni Club Computer Software Education Project involvement
  - Explorer Post
  - Wheel-chair ramp project

WOW program students

OSU engineering students with local high school students working on a robot
Current Projects

International (completed):

- Low-cost laboratory development for higher-education
- Casa de Maria y el Niño orphanage, computer donation and education, Medellín, Colombia (Summer 2004)
- Design courses in low-cost housing and drinking water purification

OSU Environmental Design Team takes first place at WERC competition!
International project (Spring Breaks 05, 06):

- Montaña de Luz, HIV/AIDS orphanage in Honduras
  - Pre-project trip completed Summer 2004
  - Web page
  - Electrical wiring
  - Administrative computers
  - Children’s computer lab
  - Computer education
  - Assess communication problems

- Challenges...
Relations to Service-Learning

- Ideas here useful for service-learning programs?
  - Augmentations to ethics/professionalism education provide foundational theory and motivation
  - Can augment service-learning with pro bono spirit

- Service-learning via design projects useful for educating the volunteer engineer?
  - Yes, educate on similar topics (community-oriented design projects)
  - But, course credit destroys the spirit of pro bono service?!
  - Should service-learning be required? For capstone design?
Educational Infrastructure, Vision

- Course needs (ethics, sustainable development, global poverty, science-technology-society, etc.), required service hours or service course?
- Service-learning program? Engineering volunteerism minor, designation on diploma, award?
- Faculty attitudes/involvement
- Office of Community Service
  - Director and staff
  - Initiate and run programs, serve faculty for development of design projects, development, promotion
  - Interface to “corporate citizenship programs” in industry (teams?)
  - Help build “infrastructure” for the volunteer engineer
Profession-Wide, Career-Long Infrastructure, *Vision*

- Infrastructure facilitates delivery!
- Professions (set ideals, support), need changes!
- Compare our infrastructure to doctors’ and lawyers’ (e.g., clinics)
- Government support?
- Industry support, corporate citizenship programs, can have a big impact. Let’s demand it!
Concluding remarks

1. **Claim 1**: Individual (group) professionalism *is (is not)* possible without volunteer service to the community

2. **Claim 2**: Universities are responsible for development of the profession and educating the volunteer engineer

3. **Claim 3**: Critical need for infrastructure to support the volunteer engineer (university, industry, government)

Talk based on:

- **K. Passino, “Educating the Volunteer Engineer”**
- **Paper at:**
  http://www.ece.osu.edu/~passino/professionalism.html
Final Challenge, Option #1:

- Provide a sound rationale for becoming a volunteer engineer, one that is likely to be able to convince anyone to get involved.

- Confront the critics, the issue of “good for them vs. good for me,” “altruism/cooperation - greed/competition,” and use at least one of the following perspectives:
  - Religion(s)
  - Philosophy
  - Darwinian evolution, ecology, mathematics
  - Psychology, sociology
  - Economic theory, political science
Final Challenge, Option #2

- Present arguments against performing engineering volunteerism. Consider the following:
  - Impact on your employer (e.g., taking time from work duties)
  - Impact on your family (e.g., taking care of your children, grandparents)
  - Negative impacts on society (e.g., dependency, paternalistic service)
Final Challenge, Option #3

- Better yet, consider both Options #1 and #2 and, for instance:
- Develop a policy for your company on engineering volunteerism
- Propose changes to the code of ethics of your professional society on how engineering volunteerism ideals should be stated