

From the field up:
from engineering practices to
interdisciplinary graduate
education and research

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Why begin with practices?

- Go beyond engineering problem solving
- Problem definition and solution (PDS)
 - PDS and diversity?
 - Alternatives to PDS?
- Why practices in sustainable community development (SCD)?
 - Interdisciplinarity as means to solve complex problems with people from different disciplinary perspectives
 - SCD appropriate location: multiple disciplinary perspectives; working with non-experts

Key questions

- Do engineers involved in SCD problems more easily accept the challenges of interdisciplinary work?
 - How does involvement in SCD promote acceptance of challenges of interdisciplinarity?
 - How do personal/educational backgrounds facilitate acceptance of the challenges of interdisciplinarity?

Objectives:

- to explore interdisciplinary dimensions of engineering practice in SCD;
- to trace the links of these interdisciplinary dimensions to the educational, personal, and institutional trajectories of our interviewees;
- and to analyze how these linkages might serve as guidance for reform in graduate engineering education and research.

Stepping out: politics of boundary crossing

- Listening to community
 - From water to energy
 - Villagers as mature, knowledgeable
 - Politics of hydro vs. wind
 - “she is stepping out of her boundaries”
- Discovering ‘environment’
 - Water: from physical object to resource
 - Building organizations to ‘step in’
 - Mapping communities through non-experts

Links to educational/personal trajectories?

- Moments of freedom for boundary crossing
 - cultural anthropology; field work
 - questioned math models; discover LCA
 - Currently in non-traditional environment
- Availability of funding for problem-based areas
 - GANN, IGERT
- Challenge to be heard
 - Environmental science: water as resource
 - But knowledge of organizational building?
- From development- to community-based projects
 - Questioning of expert knowledge
 - Need to work with non-experts

Clues for reform in S&E

How can we institutionalize

- ‘moments of freedom’
- education in mapping possibilities to realize commitment to interdisciplinary problem solving
- education in bringing people together and build organizations
- education in trusting non-experts

Diversity rushing in?

Access. Might the institutionalization of experiences above result in a new diversification of S&E in terms of people who, in addition to being female or white or Hispanic or disabled, will be committed to interdisciplinarity as a means to solve complex and pressing problems?

Relevance. Is fostering interdisciplinary work, e.g., inspired by practices in the field, a way to redress social inequities? Are there other ways to achieve the goals of affirmative action, say via “addressing problems that engage multiple stakeholders and missions outside of academe, for example, that serve society” (Rhoten et al)?