

***Ethics Education for Ph.D.  
Graduate Students in Engineering:  
Issues and Approach***

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***Background***

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***ENGINEERING STUDENTS***

- *Engineering Management Master's Program*  
*50 new students each year, approx. 50% domestic / 50% international*  
*Coursework Master's, with (a) group project and (b) off-site internship*
- *MS and PhD programs*  
*40 new students each year, approx. 70% domestic / 30% international*  
*Research based. Not all have research experience*

***ISSUES***

- *all the usual lab science considerations: evaluation of data, time pressure to publish, what to include when publishing, what to reference on ppt, what is sponsor interest.....questions most have never considered*
- *group projects, internships – some, first outside-of-classroom experience*
- *Dartmouth Honor Code: non-proctored exams, take-home exams*



## ***Departure-from-Classroom Challenge***

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### **CHANGE IN METRICS FOR SUCCESS**

- **CLASSROOM:** Search for the “right” answer
- **LABORATORY:** Search for the “new” answer

### **NEW SET OF EXPECTATIONS**

- **Most students don't take course in research procedures**
- **Lab norm established by adviser, senior students**
- **ADVISER:** Prior research in lab creates expectations
- **STUDENT:** May feel pressure to produce quickly, publishable results
  - **Throw away “bad” data?**
  - **Photo-shop image to improve presentation?**



## ***Dartmouth Approach***

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### **BROAD ETHICS TRAINING COURSE**

**ALL new science and engineering students starts in orientation but CONTINUES through term FACULTY and SENIOR GRAD STUDENT facilitators Overseen by university-wide ETHICS INSTITUTE**

### **NEED\***

- **Complex issues facing graduate students**
- **Take proactive approach to address increase in student misconduct issues.**
- **Increase competitiveness with funding agencies**

\* K. Landers, Graduate Affairs, Nat. Assoc. for Grad. Studies conference presentation 2008



## ***Development of Program***

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- *Began in '04; collaborated w/ Dartmouth Ethics Institute*
- *Faculty buy-in to make requirement*
- *Orientation program sets tone, community building*
- *Trained facilitators in case method approach*
  - *Professionalism*
  - *Mentoring*
  - *Data Collection*
  - *Authorship*
- *Columbia example in packets one of several used*

\* K. Landers, Graduate Affairs, Nat. Assoc. for Grad. Studies conference presentation 2008



## ***Assessment***

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### ***Program Assessment in Winter 2008. Strengths:***

- A majority of graduate students surveyed reported a clearer understanding of their ethical responsibilities
- Tracking of honor code violations over time suggests a decline after implementation of the program – but small numbers make it difficult to tell whether significant w/o add'l yrs of data
- Helps build stronger sense of community among grad students
- Student comments that appreciate insight into issues they “had not thought of before”

\* K. Landers, Graduate Affairs, Nat. Assoc. for Grad. Studies conference presentation 2008



## **Assessment (cont'd)**

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### **Weaknesses**

- Existing cases do not address all fields
- Some students express that program a waste of their time
- Similar comments – prior ugrad ChemE REU program
  - Year 1: philosophy faculty lead discussion, essays
  - Year 2: AAAS workshop on broad issues
  - Year 3: AAAS workshop with video, faculty reviewed essay
- Challenge: getting students to understand relevance *before* they are in the lab

\* incl. data from K. Landers, Graduate Affairs, Nat. Assoc. for Grad. Studies conference presentation 2008



## **Impediments: Administrator Perspective**

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### **MULTI-NATIONAL, MULTI-CULTURAL CHALLENGE**

- **Issue frequently identified by faculty**
- **Recent conversation w/ one int'l graduate student related to Honor Code: anecdote illustrates challenge**
  - **ugrad education theoretical, text based**
  - **single correct answer, std exams, relationship w/ prof irrelevant**
  - **Honor Code?**
    - Here, small prob that small number would violate*
    - There, no such concept – expect many would violate*
    - Why? High grades publicly praised, low grades publicly chided. Goal: solution by any means*
- **Challenge to instill research ethical concepts broadly w/o being culturally accusatory or insulting. Perspectives differ.**

