Cultivating Cultures of Integrity:

New Approaches to Ethics at NSF & Opportunities for US/Japanese Collaboration

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Historical Context

- Research Misconduct – defined in Code of Federal Regulations (2002)

- OIG Research Misconduct Dear Colleague Letter (2002)

- America COMPETES Act (2007)

- NSF Implementation Plan (2009)

PART 689—RESEARCH MISCONDUCT

Sec.
689.1 Definitions.
689.2 General policies and responsibilities.
689.3 Actions.
689.4 Role of awardee institutions.
689.5 Initial NSF handling of misconduct matters.
689.6 Investigations.
689.7 Pending proposals and awards.
689.8 Interim administrative actions.
689.9 Dispositions.
689.10 Appeals.

NSF
OFFICE OF
INSPECTOR GENERAL

America COMPETES Act Section 7009
RESPONSIBLE CONDUCT OF RESEARCH (RCR)

Section 7009 of the America COMPETES Act of 2007
Education and Science) directed that the National Sci
Foundation for science and engineering research or e
the responsible and ethical conduct of research to un

Dear Colleague:

This letter describes the procedures followed pursuant to the National Science Foundation (NSF) Research Misconduct regulation. Consistent with Office of Science and Technology
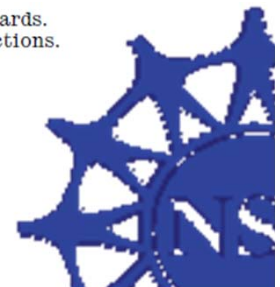
Context – America COMPETES Act

- Section 7009: Responsible Conduct of Research

  "The Director shall require that each institution that applies for financial assistance from the Foundation for science and engineering research or education describe in its grant proposal a plan to provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduate students, graduate students, and postdoctoral researchers participating in the proposed research project."

Ethics Education in Science and Engineering (EESE)
2007-2013

89 Awards -- $19 M

Focus: Graduate Education-- Curriculum and Instructor Development

Aim: Changing Individual Behavior Through Instruction

EESE Results and Materials Shared at NSF-funded Portals

- Ethics Education Library. Illinois Institute of Technology: http://ethics.iit.edu/eelibrary/

- IDEESE: International Dimensions of Ethics Education in Science & Engineering. University of Massachusetts Amherst: http://www.umass.edu/sts/ethics/

- National Center for Professional & Research Ethics. University of Illinois: https://www.nsf.gov/cgi-bin/good-bye?https://nationalethicscenter.org//

Online Ethics Center for Engineering and Science (OEC)

A new 5-year award to expand NAE's center to include all fields that NSF supports +

5-year supplement to develop

international resources (Prof. Tom Powers, U Delaware)

EESE Findings: Classroom Learning

Minimal positive effect

Main learning outcome--
greater familiarity with rules
and policies

Daily 1338638

EESE Findings: Case Studies

Somewhat more effective

Ethical dilemma presented from profession or discipline. Students suggest possible courses of action; instructor leads a discussion about the consequences

Pavlidis 1135357, Daily 1338638

EESE Findings: Active Learning

More effective/more labor intensive and narrower range

Role Play, Simulation, Practicum, Deep Dialogue

(Loui 0628814, Seager 0932490, Pavlidis 1135357, Daily 1338638)

EESE Findings: Computer-Based Training

- Pro: low costs and standardized

- Con: "does not reflect the types of interactions in which one may engage while making and acting on an ethical decision"

Daily 1338638, Ellison 1033111

EESE Findings: Little or Negative Effect

As part of regular classes without interactive activities --

Generally not effective…some cases negative impacts on ethical decision making re research

Mumford 2008

Negative Effect

Survey 7,000+ early and mid-career NIH-funded scientists

"indicated a **negative** relationship between separate ethics instruction and good data handling practices"

Anderson 2008

Engineering education may diminish concern for public welfare

Erin Cech, Rice U.

Study of 4 US universities found –

engineering students leave college **less concerned about public welfare** than when they entered

Context Matters

- "The assumption that merely providing information ensures ethical behavior is risky – at best."

- "People need **environments** that… support and encourage the practice of ethical reflection, dialog and action."

Sekerka 2009

Context Matters

Given the right **context**, we know that people can participate in uncharacteristic amoral behavioral shifts, transformations that enable them to engage in unethical decisions and acts (Zimbardo 2007). We are all vulnerable to the conscious or unconscious demands of our **social milieu**.

Sekerka 2009

Honor Codes

Don McCabe

Center for Academic Integrity

2002-13 surveys of students & faculty at 144 US colleges/universities

Many engineering schools, including 10 of top 25, have honor codes

Impact of honor codes –
Self-reported cheating

	1990		1995		2005	
	Test	Writ.	Test	Writ.	Test	Writ.
Code	23%	33%	30%	42%	14%	43%
No Code	47%	56%	45%	58%	21%	51%

McCabe 2013

Questions:

- Why do researchers cheat? Are they the same reasons that students cheat?

- If a person cheats as a student, is s/he more likely to engage in research misconduct?

- Are incidents of research misconduct more likely to take place at institutions where undergraduate cheating is the norm?

- Why do honor codes address student behavior and not faculty or staff?

Micro & Macro Ethics

There are other (macro) ethical dimensions to STEM learning and practice besides RCR.

- Are institutions or programs that are strong on macro ethics better on micro ethics too?

Changing Academic Culture and Society

"Societal rewards influence the behavior of organizations and individuals in ethically desirable and undesirable ways.

Ethics is not a vaccine that can be administered in one dose.

Teaching individual students good professional practices cannot be highly efficacious until **academic culture and society** also model and reward ethical behavior." (Hollander et al 2009)

'Cultivating Cultures for Ethical STEM' (CCE STEM)

Successful Proposals Must Address:

- What constitutes ethical STEM research and practice?

- Which cultural and institutional contexts promote this and why?

Comparisons

Successful Proposals Must Include a Comparison Either

1) between or within institutional settings

2) within a single setting, with data collected before and after an intervention (Institutional Transformation)

Some Possible Comparative Factors

- honor codes

- a campus-wide ethic of service

- service learning

- curricula that stress social justice

- institutions that serve under-represented groups

- institutions where academic and research integrity are cultivated vertically

- or horizontally (ethics across the curriculum)

- programs that promote group work

- no grading….

Theoretical Framework--Comparative Opportunities

- Durkheimian approach to ethics
- Opportunity for fruitful comparison between US and Japan

Limitations

- There are always individuals who do not adhere to the social norms (deviance; outliers)

Suggested Strategies

Adopt a Broad Definition of STEM Ethics

'When you get lemons: make lemonade'