

Research Integrity Is A Mentoring Issue, Not A Lecture Course

Town Meeting on the Implementation of the IoM Report

***Integrity in Scientific Research: Creating and Environment that
Promotes Responsible Conduct***

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Research integrity is fundamental to scientific progress, and every scientist is dependent upon open, honest communication. Our work is cumulative, based on the insights and analyses of our predecessors and colleagues. Advances in knowledge are built upon accurate, reliable and reproducible reported experiments. Even the most novel discoveries build upon the work of others. If that knowledge base is corrupt, scientific progress is hampered.

The world of research is a self-policing system of replication and verification in which the scientific community provides its own oversight. Reports of discoveries inspire attempts at verification or extension. Thus, in the long run, the record will be set straight and the public interest protected. As exemplified by the recent example of dissembling in the physical sciences, scientific fraud leads nowhere.

In the short run, however, misconduct is harmful, and honest scientists bear the cost. Researchers following false leads waste time, energy and resources. Victims of plagiarism lose credit for their labor. Theft of intellectual property robs legitimate researchers of their just rewards. When cheating occurs, the reputations of thousands of dedicated scholars are tarnished by the actions of an unscrupulous individual.

It is important, however, for legislators and the public to realize that almost all scientific errors are just that, namely honest mistakes with no intention to deceive. It is imperative, therefore, that we educate our fellow citizens about the scientific method so that they appreciate how judgments and interpretation are central to the research process and errors rarely mean cheating.

The IoM/NRC committee is to be commended for its thoughtful report. I have been asked to speak on “education in the responsible conduct of research.” And will focus my remarks on the material in chapter 5, titled “promoting integrity in research through education.”

The beginning of the chapter states, “Integrity in research should be developed in the context of an overall research education program.” While the validity of this posture is self evident, it is important to appreciate that research integrity is a mentoring issue, not a lecture course. Values are learned in every aspect of the student mentor relationship, and I share the committee’s view that all mentor-trainee interactions serve as a context for teaching ethical behavior.

Scientific disciplines differ in their methodologies and in how data are communicated. A prescriptive, one-size-fits all approach to teaching research integrity will be insensitive to these discipline-specific conventions and, thus, may appear irrelevant and out of step to many trainees. Effective training in responsible scientific conduct must, therefore, be conducted as an integral component of the individualized research environment.

The success or failure of educational efforts will rise or fall on advisor-trainee interactions. Unless trainees witness the highest ethical standards, efforts to provide instruction in this area will be meaningless. If we, as mentors, are not above reproach in dealing with trainees, we undercut the message of responsible conduct. The relationship of mentor and student includes reciprocal responsibilities. The mentor provides training and guidance and trainees contribute their labor to the research program. Loss of this balance creates a climate of exploitation. Individuals should not be kept in training beyond that which is necessary to achieve their career goals. Self-serving behavior by mentors conveys a message contrary to promoting integrity. My mentor's mantra was that the welfare of the trainee always trumped that of the mentor. I assure you, no advice has more profoundly impacted my career.

To encourage responsible conduct in mentor-trainee relationships, on April 3, 2001 FASEB adopted a policy calling on biomedical scientists to recognize the difference between mentorship and employment, and to provide the appropriate compensation in each case. The statement reads as follows:

“A clear distinction should exist between postdoctoral fellows who are in the process of being trained and other valuable research workers. Scientists with greater than five years of accumulated postdoctoral research experience should have different designations and well delineated statuses.”

In their discussion of education, the committee presents five objectives for instruction in the responsible conduct of research. It calls upon the research community to:

- Emphasize that responsible conduct of research is essential**
- Maximize the likelihood that education influences individuals and institutions**
- Impart essential standards and guidelines**
- Enable students to develop abilities**
- Verify that the first four objectives have been met**

While I endorse the first four objectives, the final proposal, focusing on verification, is more complex. I concur with the committee's conclusion that not every relevant theme or topic will arise in each trainee's interactions with his or her mentor, and therefore supplemental materials are necessary. In fact, many institutions are developing ethics education programs designed by active researchers. We hope the Office of Research Integrity will continue to support this endeavor. On the other hand, if the ultimate aim is to influence career-long behavior, success or failure of the educational effort will not be verifiable in the classroom. The vast majority of scientists are sympathetic to the goal of teaching integrity and the success of this mission will be judged by the behavior of trainees as they mature into independent investigators.

Efforts, no matter how well meaning, are not cost free. The committee states that full semester courses are desirable, and some members propose that even this exercise is too limited. Unfortunately, such demands made on the finite training time for researchers will come at the expense of other areas of instruction.

What should be eliminated? Would patients in a clinical trial benefit if a physician-scientist had fewer hours of training in medicine, less education in pharmacology or statistics? While the goal is worthy, we must take care not to hamstring the education of young scientists.

As long as research involves human decisions there will be human failings. While we will never eliminate all misdeeds, there is much we can do to improve education in the responsible conduct of research. We must be aware, however, that efforts to prevent misconduct involve costs as well as benefits and we must do all we can to avoid crippling the research enterprise by over-regulating, despite good intentions. Ethics education is important and efforts to promote integrity will benefit science and society. Voluntary programs, created and conducted by the research community, will be more successful than bureaucratic mandates. In this regard, the recommendations in the IOM report make an important and positive contribution.