

Responsible Conduct of Research (RCR) Education

The centerpiece project of the National Center for Professional and Research Ethics is the NSF-initiated national online ethics resource center, Ethics CORE. We are committed to supporting instruction in RCR as an essential aspect of career development for emerging professionals as well as practicing scholars, scientists and engineers.

Our goal is to create communities of responsible research and professional practice.

Our perspective on RCR education encompasses roles and responsibilities (who does what); best practice (essential elements of and common challenges to effective RCR training); resources to support faculty in delivering high-quality RCR education; and recommended formats and frequency.

Roles and Responsibilities

- Disciplinary faculty, as the experts in research methods and the commonly accepted standards and norms of their fields, should be on the front lines of delivering RCR education.
- Ethics CORE and others can support faculty by providing access to existing teaching materials; by assisting faculty in developing new materials; by evaluating the efficacy of teaching methods; and the fit between methods and objectives; and by encouraging faculty ownership of this essential role.

Elements of Best Practice

- Environments and faculty promote and embody congruence between the formal (what is taught) and informal curricula (the practices students see around them)
- Formal curricula should be issue-oriented, focusing on authorship practices, obligations of peer reviewers, data sharing, intellectual property, collaboration and mentoring, social responsibility, etc.
- Formal and informal education should:
 - ▶ recognize that responsible practice is a skill that takes practice and repetition;
 - ▶ focus on problem identification and resources for resolving problems once identified;
 - ▶ differentiate between ethics and regulatory compliance, promoting both at the expense of neither;
 - ▶ take place primarily in person, in real time, in small groups, frequently, throughout the career;
 - ▶ be led by disciplinary faculty; and
 - ▶ include an evaluation component to determine efficacy.

Universities and funding agencies should recognize challenges to realizing these standards, including:

- limited time in the curriculum and other demands on faculty and student time;
- faculty lack of preparation and discomfort with this role despite their experience with teaching and practicing RCR and guarding against irresponsible practices through their mentoring
- actual or perceived lack of resources, tools and role models supporting faculty.

Online compliance training is not the same as RCR education for emerging professionals

Resources

Physical, digital, human and institutional resources for education in RCR include:

- case studies, essays, syllabi of existing courses, teaching modules, instructor's guides, primers, video examples, current events, readings, all available on Ethics CORE;
- local experts on each campus;
- the Ethics CORE team;
- professional associations and disciplinary societies;
- faculty in every department who embody the research community as they publish, serve as editors, conduct research, submit proposals, review manuscripts and proposals, and participate in professional societies.

Recommended Formats and Frequency

- Presentations and discussions of topics related to professionally responsible practice should be integrated into informal interactions such as group meetings, journal clubs, brown bags, seminars, existing classes, etc.
- Independent opportunities for formal instruction should be included as part of overall professional development of students as emerging professionals.
- Both informal and formal events should occur regularly (on a predictable timetable) and frequently, e.g.,
 - ▶ once a semester vs. once a year;
 - ▶ as a one-time required course; and
 - ▶ as part of a required sequence on professional development.



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