



Online Ethics Center
FOR ENGINEERING AND SCIENCE

Educational Settings

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Descriptions of educational settings where research ethics can be successfully taught.

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Classroom

One of the most common formats for delivering instruction is courses, consisting of repeated meetings generally with a lecture and discussion approach. Such courses:

- typically meet for 1-3 hours each week over a semester/quarter
- allow for ample case analysis and discussion time
- afford the option to assign homework to be completed before subsequent meetings

Such course instruction allows for a more thorough development of basic ethical principles, and can expose students to a wide variety of ethical problems and situations. Additionally, relationships among students can facilitate deeper and more diverse thinking about some of the ethical issues being discussed in the course. A primary disadvantage is the length of time necessary for such courses; participants may be unable or unwilling to commit to a fixed meeting time for many weeks.

Ethics Across the Curriculum

The premise of the Ethics Across the Curriculum or Ethics In the Curriculum format is that ethical considerations in research, scholarship and practice should not be separated from other parts of the curricula across different disciplines and fields. The features of such programs are:

- appropriate ethics issues are inserted into course sessions or research group meetings
- conveys the message that ethics is part of, not separate from, the practice of science and scholarship
- creates a model for ongoing and continued ethics discussion

This is an integrative approach to teaching research ethics, and allows the student to understand ethical practices from within specific fields and disciplines. A disadvantage of this approach is that it does not normally allow for developing more basic ethical principles nor detailed analyses of different kinds of ethical situations.

The [Society for Ethics Across the Curriculum](#) promotes ethics in scholarship, exchange of research information, and the teaching of ethics in all academic disciplines. This site offers links to resources for ethics across the curriculum, a link to their publication Teaching Ethics, and information about their annual conference. The society meets annually for four days of educational activities, with meetings hosted by different institutional members. The theme for each annual meeting varies, but session proposals on other topics related to ethics across the curriculum are always welcomed.

Online

Although there are generally no actual face-to-face meetings, an Internet-based course can nevertheless provide opportunities for repeated “e-meetings” (e-mail discussions, chat rooms, bulletin boards), the assignment and discussion of homework exercises, and ample time for extended discussions. This format of instruction is not yet widely used, but can typically be structured to consist of 10-15 units, each of which might mimic a classroom-based lecture. Instruction depends on a combination of concise introductory text for each unit, web-based links to relevant resources, assigned readings (in a course textbook or other print media), and some form of electronic discussion. This approach has some of the following features:

- Trainees have an opportunity to develop a rapport and confidence (Internet-based)
- Everyone can have a voice in discussion; everyone's comments are available to all other participants
- Because comments are written, they will often be more thoughtful than the opinions rendered spontaneously in a class discussion (although conversely, such an open forum can lead to long, unfocussed responses)
- Assignments can be completed at any time

- The time between topics allows for homework assignments and continued reflection on the preceding unit
- Common principles of ethical decision-making can be part of the curriculum

A primary disadvantage is that participants may choose to read and prepare less than if faced with meeting in a classroom, and much more time is needed for participants to clarify their positions than in a face-to-face discussion.

An Internet or CD-ROM based tutorial is distinguished from a course in that no instructor involvement is required. This format is typically structured to consist of multiple topics with online readings, incorporating multiple choice questions to verify completion and/or understanding of the material. This approach has some of the following features:

- information about general research ethics topics and resources for further investigation can be easily conveyed
- assignments can be completed at any time
- certification of completion is readily documented at relatively low expense

While it can be argued that this method is less than ideal for dealing with the many ambiguous questions raised in discussions of the responsible conduct of research, tutorials can nevertheless provide the broad and specific information which is the necessary foundation for beginning to think about these issues. Used as an adjunct to seminar series or workshops, for example, tutorials can ensure that participants have the same basic knowledge base.

Research Context

Ongoing education in the context of the research environment is likely to be the most appropriate and effective means to promote research ethics.

One of the most important mechanisms by which knowledge is passed from one generation to the next is mentoring. In the sense that a mentor is an individual who has succeeded by overcoming the hurdles to success, he or she is in the best position to help a trainee face those same hurdles. Mentoring might include many

topics, one of which is the responsible conduct of research or research ethics. Unfortunately, such mentoring is infrequent or even non-existent (Swazey and Anderson, 1996; Brown and Kalichman, 1998).

Although *one-on-one* mentoring is an important part of graduate student training, much of training in practice occurs in the context of research groups. Very little has been written about teaching research ethics in this setting, but it is clear that much can and should be learned about the roles, responsibilities, and joys of science through the process of conducting research.

With support from the National Science Foundation (2011-2015), Drs. Plemmons and Kalichman developed a workshop curriculum to empower faculty to better introduce research ethics conversations into the context of the research environment.

Please see the [Instuctor's Guide to Prepare Research Group Leaders as Mentors](#) for the full text of this guide, as well as example syllabi for both a full-day and a half-day workshop.

Other opportunities, in context, for teaching about and discussing research ethics include, for example:

- Handouts and Guidelines:
Materials provided to members of research group to highlight standards and practices.

- Regular Individual Meetings:
Periodic conversations allow for issues to be addressed as they come up and over time.

- Journal Clubs:
Regularly scheduled group meetings to discuss the discipline-specific literature are a frequent feature in many areas of research and an excellent opportunity to also address literature for which research ethics issues are either raised explicitly or can be found by way of example.

- Research Lecture Series:
Research groups or departments often schedule regular research lectures,

which present an opportunity for either addressing ethics issues of particular importance to the discipline, or for researchers to raise questions with one another about the ethical concerns raised by the conduct of their research.

- **Group Discussion to Generate Policies:**
One effective way to raise awareness of appropriate standards of conduct is to challenge members of a research group to collaborate in developing their own guidelines or standards.
- **Recommended Readings:**
Mentors and research colleagues can foster an environment of thoughtful discussion and reflection, in part, by recommending readings such as those included on this website.

Other

The Online Ethics Center maintains a [number of resources](#) including collections of cases, essays and other teaching guides on all aspects of research ethics education.

The Office of Research Integrity (ORI) also maintains a list of a variety of free resources and materials for teaching responsible conduct of research at:

- <https://ori.hhs.gov/general-resources>

An ongoing series of seminars is another useful way to promote discussion and understanding of the ethical dimensions of research. Some features of this format are:

- sessions are typically offered weekly or monthly, ranging from 1 to 2 hours
- the focus is on voluntary discussion, rather than mandatory attendance
- asking faculty to lead seminar discussions is an excellent way to promote faculty involvement

A primary disadvantage is that a seminar series is not an ideal approach to teach a specific curriculum or to certify completion of an identifiable program of instruction in the responsible conduct of research. It can also be difficult to engage graduate

students other than as audience members unless the series is intentionally crafted to do so.

Workshops are another commonly used format for teaching about the responsible conduct of research. Some features of this format of instruction are:

- these are typically scheduled as one-day events, with several offered throughout a semester/quarter, ranging from 1-8 hours each
- they represent an ideal opportunity to deliver specific information (e.g., institution-specific policies and procedures)
- they can include case-based discussions

A primary disadvantage of such discrete meetings is decreased opportunity for continued development of and reflection on a topic (e.g., with homework assignments); additionally, such a format may not afford participants the opportunity to develop rapport with one another.

Contributor(s)

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Rights

Use of Materials on the OEC

Resource Type

Instructor Materials

Parent Collection

Resources for Research Ethics Education

Topics

Teaching Ethics

Discipline(s)

Research Ethics

Teaching Ethics in STEM