

Cases for Teaching Responsible Communication of Science

Teacher's Guide for Discussion (Short) Versions

1. Introduction to the pedagogy

Students learn to be effective science communicators when they are taught basic communication principles and given opportunities to practice. But ethical communication requires prior reflection on significant communication choices and evaluation of alternative courses of action. For this reason, teachers of ethics often use case-based instruction. An ethics case study involves a story that establishes an authentic setting, surrounds the student with ambiguous but potentially relevant information, and requires her to make and justify a choice. A good ethics case study should help students to distinguish among conflicting values and to appreciate alternative points of view. The advantages case-based instruction include:

- heightened student engagement due to the realism and relevance of the case
- opportunities to apply ethical principles and values to complex circumstances

There are numerous methods of incorporating cases into a classroom environment. We have prepared Teacher's Guides for two of these methods: (1) a case-based discussion where students reflect and respond to guided questions about a particular case, and (2) a case-based role play where students are assigned to represent a character in the events and to interact with other characters.

This document outlines the method for the case-based discussion. Additional advantages of case-based discussions include:

- shorter time commitment from both students and instructors
- ability to tailor the discussion to different class settings and available timeframes

The main disadvantage of using the discussion-based version of the case is that students may be unfamiliar with some perspectives on the case, which may restrict the diversity of viewpoints expressed in the classroom. If you want to ensure more comprehensive coverage of differing perspectives, we encourage you to use the *Role-play Version* of the case.

2. Learning objectives

The cases aim to help students become more reflective about their personal commitments to communicate their scientific knowledge effectively and ethically. Participants in case study exercises should improve their abilities:

- to recognize ethical issues in communicating science, as distinct from challenges of effective communication and from issues in the responsible conduct of research
- to identify and explain different perspectives, interests, and interest groups involved in issues of science communication ethics
- to reason soundly about important issues in science communication ethics
- to articulate, explain, and make cases for alternative perspectives on issues of science communication ethics
- to communicate clearly and powerfully on complicated and controversial topics

3. Overview of the case materials

The student packets for each case generally contain the following materials:

- *Background* of the case
- *Working Draft* of the communication artifact (where relevant)
- *Questions for Discussion*
- In addition, each case includes the following materials for teachers:
- *Issues Brief* summarizing the main arguments from all perspectives, based on interviews with the participants in the event
- *The Outcome*, generally including the communication artifact actually issued
- *Annotated Bibliography* of short, opinionated essays available online, for possible assignments for students

4. Procedures

Case studies work better if students have access to the case packet before class. You may want to assign brief homework; discussion flows more smoothly if students are charged to bring in bullet-point summaries of three different arguments to make during the discussion. You might also ask that students locate a web source relevant to the case.

Begin the discussion by explaining the overall learning objectives of the case study. Break the class into small groups of two to six students and allow 5-10 minutes for the students to discuss and prepare their group presentations. Remind them that each group will be expected to share their thoughts. This prior group work helps students articulate their ideas before the full-class discussion and leads to a greater willingness to share.

Bring the groups back together for a 20-30 minute discussion of the issues. Ask which group would like to answer the first of the listed questions on the discussion exercise handout. If no group volunteers, choose one. After the first group has spoken, validate their responses but note that there are other possibilities. Ask for any group who disagrees or has a different perspective on the question. Again, if no group volunteers, choose one.

Continue to facilitate the discussion based on the responses. If groups are sharing their thoughts freely, step back and allow groups to converse naturally. Make sure to invite participation from any groups or individuals that are being left out. If groups are more reserved in sharing their thoughts, you may need to step in to motivate discussion. One way to do this is to go around the room, hearing from each group, and then ask which groups agree or disagree with certain issues that arise.

If most of the groups seem to agree on their answers, announce that you will play Devil's Advocate and actively insert arguments that counter the shared views, or join up with the minority to help them with arguments for their position. If groups seem overly focused on a restricted set of issues, it may be appropriate to bring up broader issues or to inject counter arguments as a way to broaden the discussion. Consult the *Issues Brief* document in the teaching materials for an overview of the main issues and arguments in the case.

Routinely summarize to the students the themes that are appearing from the discussion. It may spark deeper thinking. When there are only five minutes left ask for any closing remarks.

Close the discussion with 10 minutes of debriefing. You may want to assign a "one minute paper" asking students to articulate the most important thing they learned from the discussion, plus possibly an important point that remains unanswered. Reveal to students the actual outcome of the case, sharing where appropriate the message actually issued (included with the case materials). Invite students to discuss whether the best decisions were made by the original participants. Help the students reflect on the larger themes of the discussion by spending the final few minutes asking them to generalize from the results of the discussion. Possible questions include:

- What do you think are the most important issues in this case?
- What were the strongest arguments that came up during the discussion?
- Did your views of the issues change as a result of the discussion?
- After the discussion, what remains the "muddiest point" in the case?
- In what ways might you face a similar situation in your future career?
- After participating in this case, how would you respond to that situation?

5. Assessment

We recommend assessing the discussion on a pass/no credit basis for active participation and/or the "one minute" response paper. For a more highly weighted grade, you may want to assign a formal paper to help students synthesize their understanding. We suggest a short personal position paper asking students to state and support their views on the issues of the case, possibly with reference to one or more assigned readings from the case's *Annotated Bibliography*.

6. A note about realism

Cases developed for this project are based on real events in which scientists or science communicators faced significant communication choices. In addition to researching publicly available materials about the events, the project team conducted interviews with participants in them and others with valuable perspectives on them.

In most instances, the case studies have been at least lightly fictionalized. The central *communication choices* students face in the case studies are very similar to those in the actual events. The *perspectives, arguments and opinions* stated in the case studies are based on the perspectives of those we interviewed, as well as on published sources. In general, the *characters* in the cases do not represent actual participants in the original events. Many of those interviewed for the cases had balanced perspectives and showed a vivid appreciation for the arguments of those who arrived at final judgments different from their own. In general, statements from different interviewees were split up and combined and then assigned to characters based on our sense of what would produce a good classroom exercise. No views expressed by a character in this case should be attributed to any real person.

7. Acknowledgements

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