Cases for Teaching Responsible Communication of Science
Teacher's Guide for Role-play (Long) 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 an approach to teaching a case-based role play exercise. Additional advantages of case-based role play exercises include:

- exposure to multiple perspectives, including ones that students may find unfamiliar
- more complex evidence students must use to reflect upon their understanding

The main disadvantage of role-play exercises is time; the science communication ethics cases take 55-95 minutes total over two or three class sessions. If you want to use a case in a shorter timeframe, we encourage you to use the *Discussion 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:

- *Introduction* to the case, and overview of what to expect in the role-play
- *Table of Contents* of the student packet
- *Class Procedure*: a detailed outline of each step of the exercise
- *General Background Information* on the case, for all students
- *Working Draft* of the communication artifact (where relevant)
- *Overview of the Character Positions*
- *Specific Background Materials* for students in each role
- 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*, in general including the communication artifact actually issued
- *Annotated Bibliography* of short, opinionated essays available online, for possible assignments for students

4. Procedures

Set-up (5-15 minutes), at a class session prior to the role-play activity. Start by introducing the learning objectives for the exercise. Then divide students into the number of groups needed for the case, and assign each group a role. In general, there are three or four roles; see the case materials for exact details.

Lay out for students the basic responsibilities of their groups during the role-play; again, the specifics vary based on the case chosen. In general, each group should expect to state their positions and arguments in a five minute opening statement before answering questions from other groups for an additional five to ten minutes. In some cases, one group will be assigned responsibility for managing the discussion.

Finally, assign homework. We suggest requiring:

- reading the case materials thoroughly
- doing an assigned reading for the role (see the case Annotated Bibliography for appropriate material available online)
- locating one new internet resource relevant to the role
- preparing three bullet points of arguments from the perspective of the student's assigned role

You may want to require students to hand in this material as a way of assessing participation. Depending on the class structure, groups could be required to meet in person or electronically to coordinate their arguments prior to the next class session.

The case role-play itself (40-60 minutes). Remind students that their responsibility is to represent the perspective of the role they have been assigned, and that all group members should take an opportunity to speak. If necessary, discourage students from either ironically distancing themselves from their roles or trying to defeat the opposition. Their goal should be to persuade the other participants, and they should expect to achieve this by strong arguments and mutual respect. Warn them not to read directly from the case materials, although consulting them during the discussion is expected. Then give the students a brief opportunity (5-10 minutes) to regroup and prepare.

You may notify students prior to the discussion that as the instructor you will be taking one or more of the following roles:

- timekeeper
- discussion manager—if a student group isn't assigned to manage the discussion
- devil's advocate, intervening with questions to raise issues that are being missed. See the *Issues Brief* included with each case to see what to expect.
- one of the roles in the discussion—especially in small classes, or if students are unprepared to represent one of the perspectives
- a participating member of one of the groups—especially in courses at the graduate level

Don't be surprised if the discussion starts slowly. An issue may need to be raised two or three times before students begin to engage it seriously. If points begin to be repeated too often, however, you may either change roles if necessary and intervene as "devil's advocate" to introduce new issues, or shorten the groups' assigned times slightly.

Debriefing (10-20 minutes). In our experience, while the discussion may be exciting, the deep learning happens when students step back and reflect on the issues from their own perspectives. Ideally, this debriefing will happen immediately after the debate, although it may be put off until the next class period if necessary.

Start by inviting participants to relinquish their assigned roles. You may want to assign a "one minute paper" (or an informal writing to be done outside of class), asking students to articulate the most important thing they learned from the discussion, and an important point that remains unanswered. Or you may begin by asking whether anyone has thoughts about the case that they were unable to express because their ideas were at odds with the perspective of the group to which they had been assigned.

Next, reveal to students the way 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 handing in the homework 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

8. Bibliography: pedagogy

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