

**INSTRUCTIONAL DEVELOPMENT:  
TEACHING OUR DIVERSE STUDENTS**

**Solomon Friedberg  
(Boston College)**

**Cases Developed By:**

**Solomon Friedberg (Boston College), Project Director**

**Avner Ash (Boston College)**

**Elizabeth Brown (Dartmouth College)**

**Deborah Hughes Hallett (University of Arizona)**

**Reva Kasman (University of Illinois Chicago)**

**Margaret Kenney (Boston College)**

**Lisa Mantini (Oklahoma State University)**

**William McCallum (University of Arizona)**

**Jeremy Teitelbaum (University of Illinois Chicago)**

**Lee Zia (NSF)**

**External Evaluator: Mary Sullivan (Rhode Island College)**

**Funded by FIPSE grant P116B980015**

## **Plan for Today**

- **Experience a case discussion**
- **Video of grad students in a discussion**
- **Remarks on leading a case discussion**
- **Discussion of using Cases in a TA or faculty-development program**

## Leading a Case Discussion

**Goal:** development of insights and skills for dealing with the particular problems at hand and the development of broader perspectives on good teaching.

**Open ended:** there is no one way of being a good teacher; similarly, there is no one right solution, discussion, or perspective to the cases. The goal is to get each participant to develop his or her own successful approach to teaching.

## Logistics

**Time:** One to two class periods (one hour to one hour and a half each).

**Participants:** TAs (advanced TAs and faculty welcome), faculty, adjuncts.

**Room:** The group may be organized with the facilitator in front, or in a circle.

**Procedure:** Participants may read the case in advance or in the first minutes of the TA-development meeting. Follow by discussion.

## Leader Preparation

- (1) Get to know the case well: read it several times and think about the questions in the teaching guide.
- (2) Then formulate for yourself the goals of your case session, and the three to six questions which *should be asked* in the session. Include action questions—“what would *you* do or say?”—as well as more conceptual questions.
- (3) Imagine a range of participant answers or responses and plan how you will react to each. You may wish to map out some signposts along the way to guide the discussion, such as some particular places in the case where an important event has occurred.
- (4) Next, imagine that the discussion stalls out early, or that everyone sees things the same, in black and white. Plan what you will do or say to get it moving. For example, be prepared to ask participants “can you imagine any other way to see things?”; to challenge the group view or to take and defend an alternative point-of-view; to ask someone to model for you his or

**Remarks:**

- (1) **Leading a case study session requires a different set of teaching skills than most mathematics teaching. The goal is to shape and guide the discussion without overpowering it or stalling it. But events happen quickly and one must be able to respond immediately. Preparation is crucial.**
- (2) **Experienced case presenters in other disciplines often make many pages of careful notes in advance concerning the discussion, planning what to do if certain situations or comments arise. The notes may be organized as a tree. Though not every user of these cases will have the time and energy to prepare to this level, some advance thought is crucial.**

MAIN POINTS TO KEEP IN MIND:

- (1) **Mathematicians are not all used to talking about teaching. You can break the ice by having participants separate into small groups and carry out some specific case-related task for the first few minutes of the discussion. (Possibilities in the Teaching Guide.) Summarizing the results for the full group starts the group discussion.**
- (2) **It is also useful to have a structured conclusion, which gives participants something to “take home”.**
- (3) **Because most of the cases have multiple themes, discussions with quite different emphases may arise out of a single case. Focus at least part of the discussion on specifics: how do you communicate this mathematical point, what do you do next, what specific things can you do to avoid this situation. This may require direction from the faculty facilitator.**
- (4) **It is extremely useful to have some experienced voices in the room. If you are working with beginning TAs, a few advanced TAs and even faculty attending a TA-**

- useful in fostering this.
- (7) If the blackboard is to be used, it is best to use it to record important points or to make a list of issues or possible actions, rather than to record everything said.
  - (8) There is a learning curve to learning to lead a case discussion. Start with a case dealing with a concrete issue, such as grading an examination, and work towards one with a more abstract theme such as motivating mathematical ideas. With each experience as a leader your skills will increase.

## Using Cases in a TA-Development Program

### Suggested Guidelines:

- (1) Most TA-development programs will begin with fundamental points regarding preparation, blackboard use, and professional behavior. Often the TA trainees will deliver practice lectures. At this point, it is suitable to introduce Case Studies.
- (2) Begin with a case which has a concrete component to it.
- (3) Choose cases which are relevant for your TAs. As they mature, you can point out that a case may not apply directly, but the issue it raises does apply. But at first you might want cases which are immediately relevant.
- (4) If your TAs are not comfortable with the mathematics in a case (e.g. the definition of work, Fourier series, topics in multivariable calculus, the different parts of the Fundamental Theorem), you should review this briefly before using the case.

## Modifying the Cases for Use With Other Groups

- (1) If you are working with faculty or adjuncts, the materials may be more effective if they speak about instructors rather than TAs. You might wish to change the cases slightly in order to make them fit your group (this suggestion is due to Lillian Metlitzky.)
- (2) Similarly you might wish to modify some of the cases for use with math ed students. There is also a body of cases developed by K. Merseth for secondary school math teachers (Teachers College Press, to appear).
- (3) Inducing faculty to attend a development discussion depends very much on institutional context.

## Concluding Remarks

- (1) For more information about leading a case, as well as for the case studies we have written, please consult Teaching Mathematics in Colleges and Universities: Case Issues in Mathematics Education Volume 10, 2001, available in faculty and graduate student editions from the AMS and from the MAA.
- (2) For a wwboard concerning the experiences of case-studies users, and for other information on the cases, please see our website [www.bc.edu/casestudies](http://www.bc.edu/casestudies).
- (3) We have made a video about how to use case studies. Please check our website or contact me for more information.
- (4) I would welcome comments based on your experiences in using the cases. Please send them to Prof. Sol Friedberg, BCCase Project Director, Mathematics Department, Boston College, Chestnut Hill, MA 02467-3806, [friedber@bc.edu](mailto:friedber@bc.edu).