

TEACHING STATEMENT

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For the past twenty years, I have enjoyed various forms of teaching, including classroom instruction, swimming instruction, dance instruction, tutoring, and technical writing [4, 5, 6]. I plan to pursue my teaching interests as a mathematics instructor, teaching a variety of courses at the undergraduate and graduate levels. A challenge of teaching mathematics which particularly interests me is that of soliciting participation from students. Learning from past experiences, professors, and teaching guides [2, 3], I have found four strategies to be quite effective in meeting this challenge.

The first strategy, which I learned from Professor Gil Skillman of Wesleyan University, is to respond to students' doubts with a sequence of questions of the form "Do you agree...?" In a linear algebra class these might be, "Do you agree that x is an eigenvector of A with eigenvalue 1?", "Do you agree then that $Ax = x$?", etc. When a student stops answering "Yes," to these questions, a precise difficulty often becomes clear. This procedure converges upon the difficulty fairly quickly.

A second strategy, recommended by Mattuck [2], is to give an easy surprise quiz followed by a class discussion. I have found that students appreciate such quizzes, especially when questions require no computation. (e.g. If x is a vector in \mathbb{R}^n , then what is $x^T x$? *Ans: a non-negative real number.*) These questions, inspired by examples of C programming declarations in [1, p. 122], can help to expose misunderstandings at an early stage.

A third strategy is to help students communicate by suggesting questions to them. Recognizing that students hate to appear unintelligent, I recommend that they use "I'm not sure I'm convinced," or "Could you remind me...?" as sophisticated alternatives to "I'm lost." Similarly, I recommend questions of the form "What is the significance of...?" for more specific doubts. In addition to increasing communication, these overly polite questions often add some humor to the class period.

My final strategy is to encourage participation with bribery. This I learned from the late Professor Gian-Carlo Rota, who lectured and bribed hundreds of MIT students until 1999. Following his example, I offer candy to students who ask questions in class. I believe that questions are more important than answers, because a student's *question* regarding misunderstood material accomplishes more than a student's *answer* regarding understood material. By offering candy for questions, I show students that I want to help them. I also earn nearly perfect scores on the "encourages questions" item of teaching evaluations.

There can be no doubt that interaction between instructors and students enhances mathematics education. It makes learning easier for the students and explaining easier for the instructor. To encourage such interaction, I strongly favor employing the strategies above.

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See CV for list of courses taught.

REFERENCES

- [1] B. W. KERNIGHAN AND D. M. RITCHIE. *The C Programming Language*. Prentice Hall, 2nd edn., 1988.
- [2] A. MATTUCK. *The Torch or the Firehose: a Guide to Section Teaching*. MIT, 1995. For copies, contact firehose@mit.edu.
- [3] M. S. SAMUELS. *The Technical Writing Process*. Oxford University Press, 1989.
- [4] M. SKANDERA. *Guía Para los Interfases BTS-Reuters*. Banco Santander, Madrid, 1995.
- [5] M. SKANDERA. *Introduction to Combinatorics and Graph Theory*, 2002. Unpublished lecture notes for U. Michigan course Math 565.
- [6] M. SKANDERA AND M. SWANSON. *User's Guide to the NIST Computer Security Bulletin Board System*. NISTIR 4933. National Institute of Standards and Technology, Gaithersburg, MD, 1991.