In presenting me as a finalist for the Excellence in Teaching Award (Spring 2004), it was written: His passion for the student’s enlightenment is unquestionable, and is only reinforced by his presentation of “how to be a successful student” during freshmen orientation. Always willing to go the extra mile to educate and entertain (even at his own expense), Dr. Zucker has proven himself to be a serious teacher of mathematics here at Hopkins.

Through 1993, I did in my calculus courses what many other research-oriented colleagues do: prepared for class by bringing the material up to immediate command before the lecture, and giving an acceptable lecture. The class found me just acceptable.

In Fall 1994 (110.109 Calculus II), I did much more, preparing twice for each lecture (the evening before and in the morning) to improve the presentation. This had an interesting effect: it revealed the typical polarization of the class. About half the students were happy about the better explanations; the other half was unhappy that I hadn’t aspired for less. I learned that about half the class was willing to adjust academically to mathematics in college, the other half wanted high school to continue. That ultimately led to our having an academic program on Mathematics during Orientation in 1996, and a staple presentation on Math and the Sciences 2001–05.

Virtually every college instructor wants the students to learn flexibly, so that they can apply what they learned in new situations. However, high school experience with flexibility varies with the academic discipline. A large majority of our freshmen had learned math in high school through repetition, and therefore have a very large gap to bridge. High schools, reasonably enough, ask for only high school levels of exertion and they must protect students weaker than those who can go to JHU or its peers. In Calculus at Hopkins, with the level of talent as it is, the instructor can fairly insist that the student make this big adjustment. I try to explain this in the Orientation Week presentations. But it is instinctive enough for students to resist. Most students don’t even know the two most basic differences between high school and college (see page 7 of the Hopkins Freshman Planner) when they arrive here.

We know that students in the Sciences and Engineering need to learn the material so that they can use it beyond their Math courses. There is a web of prerequisites in those areas that cut across departmental lines. I decided that I had to hang tough on this point, maintaining higher aspirations, though I knew this would be “at my own expense.” Some of it appears in what I say in Orientation Week presentations.

How do I run my courses (Calculus II for Engineering and Calculus III) now? First, I have come to a stable view of the role of the instructor. It goes far beyond explaining the material. Learning does not end in the classroom! Explanations in lecture that are perceived as clear by the students do almost nothing to improve learning in a calculus course, and student perceptions cannot judge actual learning. Sure, I aim to give clear lectures, but I avoid the sacrificing of aspirations that enhances the superficial impression of clarity. Lowering the aspirations means lowering the student’s opportunity to understand the subject well enough to use it later.
Judging the professor by performance in the classroom alone is like judging a car by its upholstery. I sometimes say that the role of the instructor is to set the aspirations, to pace the students, and to orient them for learning from the textbook. Reading a math text is new for most students, but they must get started. Many students want the instructor in lecture to begin by going over the easier material in detail, wasting valuable classroom time and displacing the more challenging material of the subject; they aspire for less. Often enough instructors cooperate, I am sad to say. It is more important for the student to get used to picking up the easier things largely by themselves.

With our freshman grading policy as it is, to help the student adjust to college, I feel we must force the student to make some academic adjustment in order to get a satisfactory grade. Without apology, I run my courses so as to push the students to work at their true level, with the aspirations of college. I am unwilling to make many concessions to students at a university like Johns Hopkins who say they want less.

A favorite pastime of many mathematics instructors was to complain about their Calculus students. "They say this! they do that!" ... I think it is more constructive to try to do something about it. Doing something constructive seems largely independent of giving explanations in the classroom that are perceived to be better. That is why I concern myself so much with student responsibilities and student attitudes.