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Teaching Statement

Laying the ground for new material in lecture, I review prior concepts from new perspectives, leading to new ideas and questions. How can we answer these questions? Perhaps we made similar investigations before, or, perhaps, there are clues to be followed...and I wait for suggestions from class, discuss them, ask more leading questions. The goal is to immerse students in a discovery process.

This provides an attractive instruction (I had students declaring they had not known mathematics is so much fun!). But the actual scope is the development of thinking skills: analogy, critical thinking, abstractization power, logical thinking, independent and creative reasoning. It is amazing to see how the students' thinking develops with each lecture; by the time of the last few lectures I get a number of very interesting ideas on how to approach the new problems.

The new material is then clearly presented. I work as many examples as possible in class, starting with simple ones, and building up to more interesting problems. Examples are used to restate the new material, develop mathematical intuition and problem-solving strategies from a more general perspective. After stating a new example I wait for suggestions from class: this keeps students actively engaged and makes me aware of prerequisite material that, unfortunately, may not be mastered by a majority of students, and is briefly reminded.

Mathematics can only be learned by solving problems, and I expect students to solve an adequate number of homework problems.

I have been using symbolic calculation languages (MAPLE in particular) in my research and am very enthusiastic about the immense power that such tools add to problem solving in many ways, including mathematical experimentation. I would much like to initiate students in this experience. I consider this an addition to, rather than a replacement of traditional teaching, since the user of MAPLE needs to have intuition on methods that can be used, and on the type of result expected.

Learning mathematics is certainly essential in pursuing a path in science, engineering, finance, and in general, in any area requiring quantitative and structural analysis. But the benefit goes beyond the immediate applicability of concepts and techniques learned: it develops logical thinking, abstract thinking, rigor and precision.
And we can have fun while doing that, too.