

Teaching Statement

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During 2003–2008 in the Mathematics Department of Iowa State University, as both a teaching assistant and an instructor, I led many recitations and taught my own session as well. Leading recitations, including Calculus I, II, III, Discrete Math and Master of School Mathematics course, provided me excellent chances to observe different teaching styles and means from different professors' lectures. The observation gradually shaped my perspective and philosophy of teaching. Teaching my own session of Calculus I in Spring 2006 gave me opportunities to practise and further improve my teaching skills. Throughout this process, I gradually developed my own teaching philosophy, which can be summarized as – **inspiration and learning to learn**. I believe that the objective of learning mathematics is not merely the formulas or theorems themselves, but also the skills to learn mathematics or other subjects in the future. Students will benefit much more with the learning skills than those with mathematical formulas. I often tell my students one proverb that fishing skill is more important than fish itself. However, the means of teaching students learning skills is to motivate them and inspire their interests.

When I teach a mathematics courses, instead of starting with abstract concepts or theorems, I usually begin with questions to motivate the students to think. After stating an interesting practical situation or example, I ask the students to provide their own understanding first, then gradually lead to the underlying mathematical concepts or theorem. With this French-style teaching, students generally show more interests and pay more attention during the class. When I was teaching Calculus I in Spring 2006, I used this approach to teach the concept of derivative using the example of driving a car. Many students linked this mathematical concept to their own experience and showed great interests in learning derivatives. High performance was also observed in the quiz over the subject. Moreover, during this process, students have the chance to think about the problem by themselves, which greatly improves their own problem-solving skills. From many of my academic presentation experiences, I also notice that giving inspiration at the beginning will greatly motivate the audience and keep them focused.

Sometimes, students are still lost even after the introduction of the formula or theorem coming from a practical example, when a similar problem is asked. I then use the following four-step procedure to foster their learning skills:

1. Tell students to ask themselves questions about the given information;

2. Make sure they are aware of what is known and what is the goal;
3. Tell them to ask themselves what is needed to reach the goal and stay on track until the goal was reached;
4. Ask them to re-think about the question and summarize what is the procedure to solve the problem.

With these steps, students are now equipped not only the mathematical knowledge but also the skills to learn math. I, myself, also benefit from this procedure, i.e., to get feedbacks from the students in this Q&A interactive process, so that I can adjust my course in the future teaching. I here have to mention the book titled *Learning to Learn: Thinking Skills for the 21st Century* by Marcia Heiman and Josua Slomianko. I learned some ideas from the book and fortified them with my own understanding to form my **inspiration and learning to learn** philosophy.

One last but inevitable issue in teaching is the assessment. The most common assessment includes homework, quizzes, exams, etc. These means are not only the methods of collecting information about the performance of students, but also serve as an opportunity for the students to apply what they have learned in class and fortify their problem-solving skills. Moreover, without these necessary assessments, many students would not spend enough time to learn the course material, probably because of more immediate demands from other courses or events.

During the last semester, Spring 2008, in Iowa State University, I taught my own session of Survey of Calculus and further improved my teaching philosophy. The students presented great interests on the course contents and liked the four-step procedure in learning mathematics. In winter 2010, I teach Vector Calculus in Mathematics Department of UCSD and will further mature my teaching style. In the long run, I would like to perfect the idea of **inspiration and learning to learn** and develop a more systematic way to inspire and teach college students math and math learning-skills.

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