Teaching Statement

Katharina Probst

The pupil who is never required to do what he cannot do, never does what he can do.
— John Stuart Mill

If I had to summarize my teaching philosophy with one statement, the above quote would approximate it. I believe that teaching means challenging: pushing the limits of the students’ understanding, and thereby expanding it and allowing students to live up to their potential. I have been a student for many years now, and have learned many lessons from different types of schools that I have attended. Most notably, my undergraduate education took place at a Liberal Arts college, while my graduate education has been at a technical university. I have further attended a series of teaching seminars offered by the Eberly Center for Teaching Excellence at Carnegie Mellon University. The seminars together with my personal experience have formed my approach to teaching. More precisely, my teaching philosophy can be divided into several components:

1. Challenge students in projects, exams, and homeworks
2. Emphasize practical applications
3. Encourage students to gather hands-on experience, preferably by working in small teams
4. Provide a non-threatening learning environment by being encouraging and providing positive feedback wherever appropriate, and by being available to students

In my undergraduate Linear Algebra class, I once took a test that went beyond testing what I had learned: question by question, and in a Socratic manner, it led me to new conclusions and insights. I actually understood the material better after taking the test than before. Naturally, such a test is the exception rather than the rule, but I have learned the lesson that a test can assess the students’ progress while at the same time deepening their understanding. I have found this particular test to be a very good ‘gold standard’ when designing homeworks, projects, and exams. Students learn by actively applying what they have learned to tasks that are difficult in the sense that they go beyond what was explicitly taught in class. As a teaching assistant, I observed that students are generally not motivated to put effort into homeworks that are not challenging enough. One difficulty for me as a teacher will be to find tasks that are challenging for the best students, while not leaving behind the rest of the class. This can be done by allowing the top students to work on more difficult or involved questions, e.g. for extra credit. As was discussed at length in one teaching seminar on student cognition, this can be an important means of allowing students at different levels to learn whatever they can.

With any material that I teach, I try to emphasize or deemphasize it based on its importance outside the classroom. Some material is important to have heard about once, even though it is not applied very much in practice (be it in research or in industry), while other material is extremely important, and the students should make extra effort to learn it well. In my undergraduate and early graduate studies, I sometimes disregarded material that I would not be tested on, or for which I could not see the practical application. In some cases I had to relearn the material later because it was actually important in various research areas. As a teacher, I want to ensure that my students do not fall into this trap. Service Learning courses are an excellent way to emphasize the practical application of class material. However, regular classes can also be taught in a way that clarifies how the material is used outside the classroom. This can be done by presenting
examples from applications in research and industry that make use of the material covered in class. Even if the students do not understand all the details of these applications, and even if not much class time is devoted to them, I believe that this approach can make a very big difference to what students will retain beyond the semester.

Like many teachers, I prefer working with students in small groups. As an undergraduate student, I was used to working in small classes and teams, and have found this environment to be very fruitful. I worked on countless class projects with one or two other students. Obviously, larger classes make working in small teams more difficult. In the class for which I am currently a teaching assistant, Software Engineering for Information Technologies, we solve this problem by dividing the students into small groups. Each team gets individual attention from an instructor. I am responsible for six teams of four to five students, and I meet with each team once a week to monitor their progress, answer questions, and help them along in their homeworks. The teams work together on a series of projects. Due to the small team size, every single student receives attention from an instructor, and is not able to take a passive role in the team. I have found this to be an extremely useful tool. The larger the class, the harder it is to give individual attention to each small team and each student. However, just half an hour a week for each team has proven to be very useful.

The final, albeit not less important, component of my teaching philosophy is to create a non-threatening environment. This is particularly important in the context of my first goal of challenging the students. I have myself taken a few classes where I was challenged beyond my limits while working in a non-supportive environment. Such classes generally achieved little more than leaving me stressed. A teaching seminar that I attended focused on student motivation, and one of the main conclusions of this seminar was that students perform best when they are not under excessive stress. My goal as a teacher is to provide positive feedback to the students wherever appropriate. I believe that positive feedback is a very important and useful tool, as it shows the students that they are actually making progress. Of course, this should not come at the expense of being afraid to tell the students if they are not progressing appropriately. My experience has been that an open dialog with the students about their performance functions as a good motivator. Another element of providing a non-threatening environment is being available for students’ questions and requests. In all classes that I have TAed, I have made concentrated efforts to be available to the students, be it in office hours or by email. I have noticed most recently that a surprising amount of teaching is now done via email. In my current class, I receive on the order of dozens of emails each week with requests or questions from students. From my own experience as a student, it is convenient that an email can be sent to the instructor at any time, and that the instructor can respond at their convenience. At the same time, this tool is only useful if emails are replied to in a timely fashion. This will allow students to ask questions whenever they arise, and get quick responses. It further allows more timid students to ask questions they would not dare ask in front of the class.

In summary, I strive to be a hard but fair teacher. I want to be hard by challenging all students to perform at their best and develop an active understanding of the material. At the same time, I want to be fair by providing positive and negative feedback, and by offering availability and support in order to create an environment in which students can do what they are expected to do.