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Teaching statement

Let me explain my strategy to be a good teacher.

Teaching philosophy. The question what is the “best” or an “appropriate” form of mathematical education is indeed a hard question and no general answer is known. I personally think that I can only try my best such that my teaching brings independent, critical, effective, and compassionate thinkers to society.

The main ingredient of my teaching philosophy is **communication**. There are four forms of communication that are important to remember as a teacher.

Communication with the students. I think a crucial point in the communication between the teacher and the student is to avoid a too big distance. For example, the students should never be afraid to ask questions, because they think that their questions are “stupid”. Moreover, the students should be always encouraged to come to the office hours and ask more questions and the teacher should always spend time to explain the main ideas and basic questions in enough detail.

One important ingredient to achieve these goals is never to say or act like a (for the students) new fact is obvious just because oneself thinks – after many years of mathematical education – in this way. One should never underestimate the difficulties for humans in general to learn new concepts and ideas, e.g. it is better to give a class slowly instead of rushing to prove some theorems oneself likes; usually the students need experience to appreciate such mathematical facts.

Communication with other teachers. Teaching is, or should, be team work. For example, my teaching qualities can only benefit from having colleagues who can share their experience and thoughts and give constructive criticism. My motto is to try new things, but new ideas on teaching can be more fruitful when there are supporting colleagues. Always ask other teachers for their experience and opinion. And be never afraid to admit that some new idea does not work.

Communication styles. Nowadays the teacher has plenty of different options how to communi-

cate with the students – from oral talks to beamer presentations. One should always be aware of the different ways and one should ask what is the appropriate method to teach a certain point.

For example, a main point of the students development are exercises. With the Internet nowadays it is not useful to ask questions whose answers the student can immediately find by browsing the web. A better way of doing it is to give the student a hint where to find more information and helpful writings, if the question itself is too hard for the student.

Communication with oneself. One should always ask oneself “What should the students learn in my class?” and “How I am going to achieve this goal?” and “Is my teaching method successful?”. Moreover, one should be always aware of the fact that young students need time to learn certain facts and abilities. Always ask yourself “How long did I needed to learn these concepts?” and “How I am going to help the students to see beyond the technicalities?”.

Also one should always remember that teaching students is also improving one own skills.

Personal experience. All of my positions in the past were focused on research. But I always took the opportunity to give lectures, help to organize classes, exams and seminars, and advise students (several bachelor and master students). In fact, I gave lectures for quite diverse courses such as classes or seminars for master or Ph.D. students – with only a small number of participants, but difficult topics – and classes for beginners – with hundreds of students, but rather easy mathematics. Indeed, it is a formidable, but worthwhile challenge to teach such classes.

I already started to get some teaching experience quite early, since I took the opportunity as a young undergraduate student to teach as a *Hilfswissenschaftler* (undergraduate teaching assistant) some of the classes I had already attended before. I started teaching already in my second year as an undergraduate. While doing so, I realized in what sense the concept of using students to teach students has advantages and disadvantages. The main advantage is that the gap between students is not so big – compared to the gap between students and the professors or assistants – and therefore the younger students are not afraid to ask questions. The main disadvantage is that the older students do not have enough knowledge and experience yet.

Later, when I was a teaching assistant, I tried to avoid the main disadvantage, but, on the same hand, I tried to keep the main advantage by always staying in personal communication with the students. Since I got a lot of positive feedback from the students, I think I was at least somehow successful. Moreover, I always liked teaching and I realized how useful it is even for my own personal development.

Goal. My ultimate goal is to teach the students to hone their skill in critical thinking and analytical reasoning. Although, of course, one has to teach them the technical parts too, I think one should always keep this goal in mind.

Simply put, my ultimate goal is to train them to become mature and independent thinkers.

