## Teaching statement

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Teaching has always been an important aspect of working in academia for me, one that can be challenging at times but ultimately brings a lot of satisfaction. In a long run, I can not imagine maintaining active research without teaching in some way shape, or form. It seems to be a common sentiment that the best way to learn a subject is to teach it. Because of that whenever I had to understand a particular paper or a result I would volunteer to give a talk about it in the working seminar that I have been organizing. Although the material covered in classes that I typically teach is quite far from my current research I found that a similar principle remains true in that context. Going over the material with students gives me a unique opportunity to not only revisit it with all the additional knowledge that I have but also to look at it from a fresh perspective of my students. Because of that, I tend to treat my students as equals, who try to learn something together with me rather than from me. I think that this attitude allows me to be open that I do not know everything and that sometimes I make mistakes. This in turn makes students less intimidated to speak during the class and ask their own questions.

This is very important to me since the numerous conversations with my students seem to confirm that the interactivity of the class is one of the most important ways to boost how much they learn from it. I try to pause often asking if there are any questions or comments that way students can clarify their confusion as soon as it arises rather than wait until the end of the class. I find it very important to make these pauses quite long so that students have time to build their courage or simply to find correct words to express their thoughts. From a practical point of view, those breaks are perfect opportunities to check my notes or take a sip of water. Whenever questions are asked I try to be as encouraging as possible, saying "thank you for asking" or "this is an excellent point that you brought up...". If the question is confusing or simply off-topic I will gently push the student towards the material at hand by saying something like "that's an interesting way to think about it, correct me if I am wrong but is it the same as saying...". If that does not help or the proper answer would be too long I will encourage the student to talk with me privately after the class. Finally, it is important to reiterate that I am always ready to admit to my students that I do not know the answer to their question on top of my head but I will be happy to think and ready about it and get back to them later. This usually happened to me during programming labs when a student would ask me about some tools from a library that I was not familiar with, but the most extreme case was when a student asked about proof of Fermat's last theorem after one of the classes - needless to I had to do some reading but I was very happy to later give him a very basic idea of the strategy of the proof as well as some references they can read on their own.

When the material is particularly important and the students are not asking their own questions, or if I simply try to stir the conversation in a particular direction, I would ask my students questions. Usually, I encourage them to speak freely in such a case, but occasionally when a small group of students is dominating the conversation I will ask them to raise hands to give others, who might be a bit slower or simply shy, an opportunity to speak as well. One very important rule that I follow is to never pick a random student to answer if no one volunteers -I do not want to single out an individual and make them feel stressed out by forcing them to speak. In this kind of situation, I would simply give a couple of hints to help students reach the answer. If that does not help I would take it as a signal that either the question I have asked or the material at hand were not communicated well and I would try using different explanations or examples to drive the message through.

Rather than presenting the material as a collection of given definitions and theorems, I try to derive them together with students. To achieve this goal I frequently introduce multiple motivating examples before formulating any definitions or theorems. As my research is in geometry and I have been studying physics during my undergraduate education - I tend to draw most of my examples from these two fields, which seems to be resonating with many of my students. However I try to tailor my examples to the audience, so when teaching Business Calculus I would focus on examples related to how the market is operating. Another thing I try to include as much as possible in all my classes is applications. Unfortunately, a lot of students enter the classroom with a predetermined view of mathematics as a dead field that is not useful in real life. I try to combat that by pointing whenever possible numerous applications of the material we are covering - for example how Taylor series is used by computers to draw a graph of a function or how optimization problems are used when training neural nets. I understand that most of my students will not end up pursuing a carrier as a mathematician but I try to make sure to at least give them a glimpse of the fact that there exists mathematics beyond calculus, so for example when talking about how partial derivatives are commuting I might mention at the end of the class that there is a field of mathematics called differential geometry, which studies curved spaces where this phenomenon is no longer true.

One semester when I was doing recitations for calculus our college was experimenting with peer mentoring teaching, where students would spend the majority of recitations working in groups under the supervision of a senior undergraduate student. For many reasons this model has not been adopted by our department but I liked certain aspects of it and try to include them in my teaching. After explaining a few problems myself on a particular topic I occasionally like to write a new one and ask students to solve it in groups. That allows them to see if they can use whatever they just learned themselves, but also encourages collaboration that is crucial for students both in and outside of the university. After the time is up I would also ask if any of the groups would like to present their solution - that way they can practice their public speaking skills as well as how to communicate mathematics.

I dislike the usage of any negative reinforcement learning tools as they can be viewed as a form of punishment and would look for positive methods to achieve the same goals. For example, attendance is strongly correlated with student's success in the class, however, I would never make it mandatory. Instead look for ways to encourage students to attend classes, like give them the ability to get extra credits or make sure that the problems I cover are similar to those that would appear on the exam/quiz /homework. The only situations when I had to use negative methods to wards the students were few unfortunate instances when they were distracting and disrespectful to their peers and cheating - whenever that would happen I would ask them to leave to avoid making a scene during the class and deal with them later together with appropriate authorities.

I believe that it is important for a good teacher to be approachable outside of the classroom that is why I always stay in the room after the class is done, not only to answer any remaining questions but also talk with the students about their hobbies like movies or video games. This results in students seeing me as a regular human being and they are not afraid to approach me when we are on the same bus or eating in the same restaurant - not surprisingly it also makes them more active in the class and more likely to come to my office hours.

I have learned quite a lot about and from my students in my teaching experience so far and I look forward to learning more as I share my passion for mathematics with them. Let me close with few comments from my students' evaluations:

- He understood the material, answered all of the students' questions until they were satisfied, and seemed to really care.
- Whenever he did go to fast I could ask him a question and he would clear it up for me and tell me what I was doing wrong. He was also prepared for every lab and recitation.
- Funny and wanted students to learn.