Teaching Statement

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November 2017

Throughout my teaching trajectory, I have had the opportunity of teaching all sorts of courses to all sorts of students. From precalculus and calculus service courses for freshmen, all the way to advanced graduate courses in my area of research specialty; ranging also in style from purely lecture courses to completely classroom-flipped style (the University of Michigan has a very strong tradition of teaching introductory courses with an Inquiry-Based Learning style). Similarly, I have had students ranging from the student that is just fulfilling his/her only mathematics requirement, all the way to very bright Mathematics majors in the Honours programs. Clearly this diversity causes some aspects of my teaching to be very specific to the style, topic and level of the course that I am teaching, as well as to the slice of the student population attending that course, but there are also many aspects of my teaching that are common to all of these courses and that permeate my overall teaching practice.

- Although I always prepare class, and come to class with a clear idea of what I want to cover, I am always open to improvisation, guided by the students' questions, and by my perception of what students are understanding and what they are not. This is very clearly the case in Inquiry-Based Learning courses, for obvious reasons, but I also follow this principle in my lecture-heavy courses, where I am always open to questions from the students, and I often deviate from my lecture notes in order to explain subtle points that arise from a question or a confusion from a student, or even from a mistake of mine.

- I am aware that the contents of any given course will be forgotten eventually, except for extraordinary circumstances (for example, if the student decides to keep taking other courses in related subjects). Hence I (very subtly) de-emphasize fact-memorizing, and always emphasize the ideas behind a certain topic. When I am teaching a service course, for example in calculus, to a wide variety of students (most of which are not mathematics majors), I try to convey the feeling that mathematics is more about conceptual understanding than it is about memorizing and correctly applying formulas. When, on the other hand, I am teaching an upper-level course for mathematics majors, rather than trying to have them memorize a long list of theorems, I try to emphasize the tricks and ideas that are most commonly used within the area, effectively emphasizing *techniques* as opposed to *results*, in an attempt to convey a specific way of thinking rather than a list of specific facts.

- Mathematics is a subject about which I am very passionate. Whether I am teaching a lower-level course for the general student population, or an upper-level course for STEM-oriented advanced students, I always convey my passion for the subject at hand. I try really hard to drive home the point that mathematics (when I am teaching non-mathematics majors), or whatever specific topic the course is about (when I am teaching mathematics majors) is an extremely interesting and exciting endeavour, that has a history, to which many lives have been devoted in exchange of gradual progress in the production of knowledge, and that it is overall worth learning and worth being passionate about. I have no problem interrupting the mathematical explanations to go into the history or the philosophy of the subject, or even to references to the subject in popular culture (for example, when explaining the $\aleph$ sequence in my Set Theory class I tend to mention the work of Jorge Luis Borges). Students have explicitly told me that they really appreciate this aspect of my teaching, which makes it very different from most other mathematics courses that they take.

- I always emphasize that there is a substantial difference between *searching* for the solution of a problem, and *exposing* such solution to other people. Whether I am teaching a computations-based, or a more conceptual, or even a full proofs-based course, there is always a strong emphasis on how solving a problem involves a lot of trial-and-error (and inordinate amounts of scratch paper!), "thinking backwards" (starting from the desired conclusion and trying to climb up to the initial assumptions), and the banishing of self-censorship of ideas; whereas presenting the solution of a problem involves, on the contrary, clearly and thoroughly explaining every idea while utilizing a logical order with no gaps. Very often I will have two separate spaces of the blackboard, one containing the "how to arrive at the answer" part, and the other with the "how to present the answer" portion.

- Ultimately, I always try to convey that mathematics is a subject that is alive, that there are many things that we currently do not know and that we have people searching for those answers. That mathematics is also vast, and it has many different branches that sometimes do not at all look alike. That what prompts us to declare certain areas, or certain results, interesting or worthwhile is mostly aesthetic considerations. That is to say, that mathematics is first and foremost an outstanding product of human culture, which happens to be very successful in applications but also very beautiful and harmonious; and I hope first and foremost that students learn to enjoy mathematics (regardless of the specific level of sophistication that they achieve) as much as I do.