TEACHING PHILOSOPHY
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When describing their experiences in statistics courses, I have heard students speak of hours of despair filled with scary and incomprehensible formulas, and wondering why it is necessary to learn theorems if they are of no use outside the classroom. These, sadly, are not uncommon comments. Many people think that statistics is intimidating, overly complicated, and boring. Some even consider it a useless discipline. But, as a statistics teacher, I make it my goal not only to show my students that they can understand and even have fun with statistics: I also strive to provide students with tools to apply statistical concepts to everyday life and to any research area.

I have been in this field for the past 15 years, either as a student, a TA, a teacher, a tutor, a consultant or a researcher, tackling topics as diverse as Survey Sampling, Survival Analysis and Statistical Inference, among others. In these different roles, I learned that each one of us has a unique way of connecting to the material being presented, and, more importantly, that assimilating information is a multidimensional process. This is why my courses are carefully designed to offer a variety of learning activities that will help students go from theory to application, from realization to deep understanding: lectures, guest speakers, guided discussions, practical exercises in the whiteboard and in the computer lab, games and field trips, among other activities, that connect concepts and real life, and promote statistical thinking. If, as a student, you still need more time, space or different activities to solidify your understanding, you can always come to office hours or send me an email.

Many times we can get lost in formulas and numbers without a clue of where to go next. This is why I make it a point in my classes to keep students attention on the big picture by addressing the following questions: What is this topic about? Why are we studying it? Why is it important? What is it used for? What real-life applications does it have? This creates a mindset in which students can see through the abstract theorems and formulas: once the idea is clear, we will proceed together to represent it mathematically. Every theorem, every model and every formula tells a story, and it is my job to get my students to its happy ending.

By involving students in the thinking process, I expect to help them develop logic and analysis skills. Sometimes this can mean taking them out of their comfort zones. As it happens in many other disciplines, statistics is sometimes taught following a recipe. However, I believe there is no point in memorizing a concept or a formula if we don't understand the principles behind them. If you forget the formula, you can Google it or find it in a book. If you don't know what it is for, or how to use it, no book is going to help you. In my classes, we will go through proofs step by step, reasoning and arguing the logic to follow. This will also provide an opportunity to discuss different approaches, what they mean in the context of the problem, whether and why they are right or wrong, and, sometimes, even if they are correct, how to solve problems in a simpler, more straightforward way. What I hope this means for students, is that when this course is over, they will have enough expertise in my area to conduct research on it and to pass on that knowledge to others.

Now that you have an idea of who I am as a teacher, let me walk you through a proof to exemplify my philosophy. Say, for example, that we want to interpret the coefficient of a single binary covariate X representing treatment in a logistic regression. After reviewing basic concepts on logistic regression with the class, I ask students to break up in pairs and discuss why they think the interpretation of logistic regression coefficients differs from those of linear

regression and, without doing the proof, to come up with likely interpretations based on the nature of the response and the covariate, and the concepts of prevalence, risk, odds, and odds ratio. After discussing for 5 minutes, I encourage students to share their ideas and explain their thinking process for an additional 5 minutes, before moving on to the proof. The next step is to write the logistic model on the whiteboard and ask students how the model would look like for each treatment. After writing the models for both groups, engage students in a discussion of how best to proceed to derive the coefficient, going through each option explaining advantages and disadvantages. After settling on subtracting the model for the placebo group from the model for the treatment group, and writing such subtraction on the whiteboard, I ask students to break up in pairs again to attempt the proof by themselves using the properties of logarithms (which will be shown on a slide). After 10 minutes, each student pair will mark on a small card with interpretation choices (provided by the TA) the answer they came up with. After this activity, the class will take a 5 minute break, during which the TA and myself go over the cards and assess whether the majority of the class got the answer right. After the break, I will show the rest of the proof, emphasizing the reasons why some of the choices in the card were incorrect. Finally, to end this part of the class, I will present the results of an example from the literature and go over the interpretation of the coefficients, emphasizing the importance of logistic regression with binary covariates in research.

As you have read in the example above, I strive to provide an interactive learning environment. I believe that a teaching-learning experience can be greatly enhanced not only by making the student a central part of the lecture, but also by establishing a friendly teacher-student relationship. Furthermore, I'm interested in what students bring to the table. Each course for me is an incredible learning opportunity that allows me to shape the flow of the class to address current issues and student's particular interests. In this regard, I ask my students for regular anonymous feedback on how the class and my teaching can be improved, encouraging them to express their thoughts freely. Also, I plan to continue my education on innovative teaching methods and techniques through courses and workshops. In this way, I can provide my students with the best combination of classroom experience and formal validated techniques to facilitate their learning.

Being a teacher is one of the most fulfilling experiences I have had. I love being able to make others interested in my field, and seeing them successfully apply the concepts and techniques we have discussed in class carries a sense of reward and accomplishment. Through teaching, I have become a better statistician, researcher and person, and I am grateful to have the privilege not only to shape the minds of future generations on statistical thinking, but the power to make far-reaching impact through my students in each of their fields.