What teaching has taught me

I have taken Probability and Statistics three times, but the subject has never failed to amaze me with its interesting content. As a teaching assistant (TA) for the Probability and Statistics class at NYU's Center for Data Science, I am again thankful for the vast amount of knowledge about seemingly familiar concepts. More importantly, the teaching experience has helped me become a much better person. I would highly encourage anyone to at least teach once when an opportunity arises, and, if you enjoy it as much as I do, to continue teaching and sharing knowledge.

1. Dots connected, finally
   The first time I took Probability and Statistics course in high school, my goal was to remember and apply the right formulas to the right equations. Then, when I took the course in college, I became more interested in understanding concepts behind the formulas. However, it was not until this time when it was my job to explain Probability and Statistics to someone else that I was able to connect the dots. Teaching is less about finding the right formulas, but more about setting up the problems in a logical way to identify the right tools to solve them. For example, after these many years, I finally saw the beauty in both the Frequentist and Bayesian approaches. I realized why these methods of finding evidence about competing hypotheses and estimating parameters are relevant, and how hypothesis testing and p-value are all well connected under Bayesian statistics.

2. How to be clear
   When I use the materials to do homework and exams, it was about finding patterns and vaguely understanding what was going on. When I looked at the same concepts with the question of "How to explain this clearly to my students", I realized that, in order to be clear, I should at least understand the material, then structure my understanding in a logical way to make it easy to follow. For each problem, I started with breaking it down into smaller pieces, and rephrasing the question in a straightforward and concise sentence. Knowing what to solve and having all information available, it became much easier to fill in the missing pieces, either by creating new components or by using old concepts and formulas. The final step was to put these pieces together to form a solution. Once I understood how to approach a problem and logically solve it, the clear explanation simply followed.

3. Why it matters
   When I first took the course, it was all about proving myself and meeting my teacher's expectation. It meant the world to me to see my teacher's sarcastic comment "Satisfactory!" when I got a perfect score on the exam. In grad school, another perfect score in my final exam served the same purpose of proving myself to my professor and TAs, so the happiness quickly faded away. Now, as a TA, my desire to teach well and to be helpful did not come from any needs to prove myself to anyone, but to meet my own expectation. I designed my lab and office hours to make them useful to my students. I answered questions with empathy and curiosity, and helped connecting

key concepts and material in a big picture the way I wished someone else had done for me before. All I did was simply to satisfy my eagerness to learn and to share knowledge, as well as to be helpful to my students.