

Lifelong Learning

What's the first thing you do after learning a new thing? If you're like me, you rush to share it with anyone willing to listen! As a lifelong learner aspiring to be a lifelong teacher, I have been blessed in graduate school with opportunities to teach economics to a diverse group of students. Teaching is a fun and fulfilling complement to my research, and I find joy in sharing new ideas. To do this effectively, I aim to accomplish three objectives in my classroom:

- i. *motivate* students to care about learning a new skill,
- ii. *coach* students through the challenges and pitfalls of skill acquisition,
- iii. *inspire* students to apply their skills towards solving meaningful issues in the real world.

Persuading Students to Care

When outlining reasons why students should care, I first discuss the intellectual nihilism implied by the fundamental problem of causal inference, exacerbated in most social sciences where randomization is scarce. To test hypotheses, students must be clever with theory and brave with necessary identifying assumptions to make progress. Appreciating the difficulty of knowing anything is a powerful motivator to learn tools that make verifiable progress.

I then discuss why students should care about the specific tools we will learn. In theoretical courses which emphasize models of optimization and equilibrium to explain observed phenomena, I discuss how extrapolating findings to new settings requires knowing the assumptions that suffice for a theoretical prediction to hold in a new setting. In econometrics classes, I emphasize how estimators produce correlations which only correspond to meaningful causal parameters under additional assumptions. I illustrate early and often with examples from my own work, the work of my co-authors, as well as recent published papers.

I also devote time to the intellectual history of an idea and "teach the controversy" however it applies to capture students' attention and sustain their motivation to learn. In doing so, I carefully distinguish between positive and normative claims, while emphasizing that even asking one research question at the expense of another is normative. I illustrate this history by appealing to canonical works in the literature, as well as prominent cases of misuse, both of which reinforce the need to know when a tool works, and when it could lead to erroneous conclusions.

Finally, I stress how the skills can serve students in their careers. An economist reasons through ideas by explaining with words, illustrating with graphs, proving with theorems, and quantifying with data. Across many careers, students of economics provide valuable contributions by contemplating new problems in these ways. Whether my class is theoretical or applied, I remind students throughout of the specific ways they are improving their quantitative reasoning.

### Coaching Students Through the Learning Process

A necessary condition for success in my classroom is consistent participation. I emphasize live attendance whenever possible, remind students to keep up with homework, and encourage them to seek help early and often. I am also clear about expectations. For example, my exam questions always vary in difficulty and students should try to discern this. I align the math pre-requisites with the level of the class, so students aren't overwhelmed; from intro (more intuition, less math), to intermediate (more math), and advanced (emphasize deriving tools and properties). Additionally, I create extra credit opportunities for students to earn back points they lost, but never post their solutions. Instead, I welcome students to discuss their strategies with me in office hours!

In turn, my students can expect me to be prepared with new material each day, to answer their questions clearly (or follow-up when I am unsure), and to foster an open environment for free, respectful, and spirited debates about what we study together. I target a flexible distribution of time spent across topics, slowing down or speeding up given student needs. I remind them it is their responsibility to ask questions, and my responsibility to make it safe for them to do so while managing our pace to fulfill the learning objectives outlined in my syllabus.

A skilled teacher must clearly explain what a method does, how it does it, and when it works well, good enough, or fails. I never make this process "look easy," but instead faithfully recreate my learning process as a student, recounting challenges and failures. This normalizes the struggle inherent in learning and enables students to engage with difficult material without mental barriers. I often share strategies I found helpful as a student, like comparing homework or exam answers with posted answers and writing down new solutions using my own notation.

### Guiding Students to Solve Meaningful Real-World Problems

Identifying an application involves systematically forming hypotheses. I counsel students to introspect on their lives, challenges, privileges, and experiences. What are they curious about?

Who do they care about? What do they wish was different about the world? Caring deeply about a question is an important condition to making consistent progress towards an answer.

I advise my students to seek out these topics in newspapers, magazines, blogs, research papers, and undergraduate-targeted outlets like the Journal of Economic Perspectives. Active reading includes highlights, comments, questions, and ideas written in the margins; the goal is to have a conversation with the authors, probing assumptions, questioning the flow of the argument, and finding potential flaws. Productive research is a slow creep towards the frontier where students bravely contemplate future directions and play with alternative methods.

### Lifelong Teaching

I am always learning how to be a better teacher. A key input is the feedback I receive from my students every semester, which helps me develop more effective strategies. One area I have tried to improve is seeking a better balance between reviewing old material with more examples and motivating with extensions or applications. My students have also generously shared things that work well in my classroom (see attached student comments from evaluations). For example, I consistently talk to my students about how they are feeling, which parts of the class are working, and which are causing difficulty. In class, I maintain a welcoming, friendly atmosphere for them to openly reflect on the learning process. When they take ownership of their learning in this way, I find that students pursue advanced classes more often and engage in independent research with a diminished fear of failing. I encourage them to believe in their ability to expand our scientific frontier with novel ideas worth learning. It has been my pleasure to take part in this process as a graduate student at the University of Michigan, and I am eager to continue learning, teaching, and learning to teach in the next phase of my career!