Teaching Statement

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Teaching summary, philosophy, and approach

As a teaching assistant at Imperial College London, I have had the opportunity to teach undergraduates, graduates, and professionals a variety of subjects ranging from Transport Demand and Economics to Discrete Choice Modelling. However, while the courses and students have differed, the feedback for my teaching has remained consistently excellent. My teaching philosophy grew out of my reflections on my experiences – both as a student and as a teaching assistant –in classrooms across four universities on three different continents in the departments of Civil Engineering, Mathematics and Control Systems, Economics and Statistics. I believe that active student engagement is essential for a comprehensive, interdisciplinary education that addresses problems in engineering, econometrics, and statistics. To achieve this, I use real-world examples in my lessons, employ various teaching methods, recognize diversity in the classroom, and strive to create an inclusive environment where all students can succeed. My classroom teaching incorporates the idea of building the knowledge one step and one concept at a time. The three principles that help me achieve this objective are: work methodically, involve the students, and provide constant feedback. I aim to empower students to take ownership of their learning experience. These principles guide the following strategies for achieving academic excellence.

Firstly, a methodical approach to teaching incorporates a clear pattern of concepts, examples, and questions. After introducing a concept, I take a short break and observe the class to give students time to process the material, absorb the details, and ask any questions. This approach allows me to gauge the level of understanding, interest, and engagement of the class, and adapt my teaching to better meet their needs. I use presentation slides, writing on the blackboard, and solving examples to present the material. While I often use current and relevant examples to engage students, I also make sure to clearly explain the underlying principles, so students can apply the concept to other situations. During the first section, I clearly explain what they can expect from the course and what they are expected to do. Early in the semester, I ask my students to I'll out an anonymous early feedback form with questions like "What do you want me to start/stop/keep doing?". As the course progresses, I identify students who are struggling with the course and tailor my support accordingly. By involving the students, I share the ownership of learning experience with them. I encourage students to participate in class by writing and giving verbal or nonverbal responses such as raising their hands, giving a thumbs up, and other gestures. I incorporate exercises using Microsoft Excel, editing simulation codes in open-source software such as Biogeme, R and Python. I also use questions to stimulate critical thinking and collaboration, such as asking them to consider the next step in a problem, provide alternative examples, and explain the concept to their peers.

Secondly, the feedback for learning is divided into formative and summative assessments. The tutorials questions solved in the classroom form the formative assessment, where the students are encouraged to attempt tutorial questions in real time and discuss the process among themselves. This also involves coursework presentations which are provided feedback upon before final submission. The coursework report and examination form the summative assessment, where I provide equal weightage to the thought-process used in deriving the solution, as well as arriving at the correct solution. Outside the classroom, I try to provide students with ample resources to have success in the class. This involves sharing vetted open-source lectures offered by MIT, NPTEL and Coursera. Contrary to popular belief that these could undermine the classroom learning experience, I believe that access to a variety of lecture materials can only strengthen the learning experience.

Thirdly, I recognize that students in my classroom have different backgrounds, experiences, identities, and expectations, and as a teacher I build a welcoming community for everyone. To know my audience, I hand out a "getting to know you" survey asking students questions about their mathematical background, concerns about the class and their expectations. For instance, I have previously arranged meetings with first generation college students outside of regular office hours to guide them on how to study for a university course and provide them with relevant resources. I encourage students with low self-confidence to solve extra credit assignments, to not only develop a better understanding of the key concepts but also to boost their confidence. I hold review sessions and practice exams to familiarize students who are taking a university class for the first time with

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what to expect in the exams. As a student, I learned best by taking notes. However, I also recognize that for some students taking notes is a distraction. As a result, I accompany my lectures with detailed handouts that recount the important themes and expand upon them to incorporate related topics that I may not include in the lecture. Furthermore, I believe an important component of being a good teacher is simply being available and approachable. Despite living in COVID times for much of the time I was teaching at Imperial, I found innovative ways to stay connected to students. In addition to standard office hours, I made sure that students felt comfortable contacting me at their convenience via email.

Teaching experience

In Fall 2022, I served as the Graduate Teaching Assistant to Dr. Aruna Sivakumar and Dr. Dan Graham for Transport Demand and Economics (undergraduate level). My role was focussed on the section of discrete choice modelling techniques and linking the same to transport economics and network models. The course was designed for advanced undergraduate students in civil engineering, but also available as an elective to other similarly interested students. I led a one-hour session on tutorial assignment each week, supplemented by one-hour tutorial on using open-source software Biogeme to estimate choice models. As the course was structured around real-world choice modelling, I created a coursework module focussed on a simulated city dataset for the students to work individually and apply the concepts learned in class, as well as learning from formative assessment during tutorial sessions. Given that many of the students found the coursework particularly challenging, I spoke and exchanged e-mails with many students in the class—often multiple times—to assist them in organizing their ideas and providing support in developing their assignments. The higher-than-average marks of this class and favourable comments I have received for being accessible outside of class further attest to this aspect of my approach. Additionally, I also evaluated the coursework reports and final examination. In Spring 2020, '21 and '22, I served as the Graduate Teaching Assistant to Dr. Aruna Sivakumar and Dr. Fangce Guo for Advanced Transport Modelling (graduate level). My role was focussed on the course project examining different potential logit model structures that might be used to describe the travel choices contained in the travel survey data. In addition to taking tutorials for software development for the analysis, I also assisted in grading the coursework.

Teaching proposals and interests

I have a broad set of teaching interests and, as I have demonstrated, am more than willing to teach courses that extend beyond my core research focus on discrete choice methods and transportation planning. In addition, I am interested in developing a course (Data Science for Econometrics) which would concentrate on more advanced topic of structural estimation from the perspective of data science and analytics, following previous courses on probability, statistics, and linear regression. The goal of this course is to provide you with an in-depth understanding of the most common structural estimation methods in modern empirical economics and with the technical ability to apply these methods to your own research. The course will focus on the application of these methods to discrete choice models, which underlie many economic decisions studied in applied microeconomics and related fields. Below is a sample of the courses that I am interested in teaching: Probability and statistics; Machine Learning methods for statistics; Maximum Likelihood Estimation Statistics; Mathematical Statistics; Consumer Demand Modelling; Discrete Choice Methods; Urban Transportation Planning.

Teaching references

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