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— Teaching Statement

As with my scientific background, my teaching experience is interdisciplinary: I held two exercise classes for “Mathematics for Molecular Biologists” at the University of Vienna and taught the course “Numerical Analysis” at New York University, as well as a College Bridge Class for the New York Math Circle. However, the interdisciplinary nature of my teaching experience extends beyond academia and into the realm of non-formal education: As a representative of an NGO, I was a trainer for two 10-day workshops in Uganda and Italy on Gender Issues and Project Management. My experiences there opened my eyes for teaching techniques less known at universities, which are highly effective to keep students’ concentration high and make lessons “stick”.

As a lecturer, my goal is to create a learning environment that causes students to become part of the lecture. From my colleagues in non-formal education, I learned that effective learning is often connected to emotions (surprise, anticipation, pride, etc.) and that active involvement is the key. Here are some strategies I use: I start a term by asking about students’ expectations, continue to pose questions frequently, or I let them vote on, e.g. whether they think a strategy will be successful or not. To spark students’ interest I use dramatic and surprising examples (“This rocket exploded, because of a numerical error”) or try to create suspense (“By the end of this chapter, you will know the secret of Google’s Page Rank algorithm”). To avoid students’ interest dropping, I include small intermezzos roughly every 20min, which can consist of a numerical demonstration, a graphical summary or a funny anecdote connected to the topic. In the future I am keen to try out new methods, such as the *flipped classroom* or encouraging questions through awarding points.

I try to cater to the individual abilities and interests of all my students; students could talk to me after class, by appointment and of course during office hours. I use those meetings to ask students for feedback in order to, e.g. re-explain an unclear concept in the next class. If class size allows, I make a point to know students’ names. For my Numerical Analysis course I used the forum-based platform *piazza.com* to communicate with my students online. Through this tool I also encouraged students to support each other, which I believe is an important ingredient of a successful course.

While a good in-class lecture might be necessary for an effective class, it is by no means sufficient. My evaluation methods are chosen to encourage students not to fall behind during the term. I believe frequent quizzes and homework can be a good addition to larger exams at the end of the term. I think it is important to transparently define grading criteria and keep students updated on their performance throughout the term. In my research a key aspect is to evaluate my own mathematical models and results critically and adjust where necessary. I try to convey this critical thinking by posing also more difficult and open exercises for students and included e.g. some small projects involving modeling and programming in my College Bridge Course. Courses I would particularly enjoy to teach are for example (but not limited to) Differential equations, Numerical Analysis, Modeling, and any course connected to biomathematics.

While I am always eager to enhance my teaching toolbox, the feedback I received so far confirms that my approaches are effective. Students generally perceive my courses as “challenging”, but awarded me $\approx 4.7/5$ on all my courses. A less quantifiable, but deeply rewarding feedback I received, was when a student was inspired by my class about the Google Page Rank algorithm and asked me to discuss his own ideas for a restaurant/movie/etc. recommendation algorithm on Social Media, which I of course gladly did. I also learned a lot from my students: My Molecular Biology students taught me that appreciation for mathematics does not come naturally to everybody, but can be sparked with the right examples. My Numerical Analysis students helped me navigate the US education system with great patience. I am grateful to them and also to my supportive colleagues.

A handwritten signature in black ink, reading "Dr. Angelika Manhart". The signature is written in a cursive style with a long horizontal flourish extending to the right.

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