

Writing Fellows Program – Stefanie Wang

My primary goal for in the Writing Fellows Program was learning how to better teach writing proofs to students from a wide background. Teaching students how to write proofs includes teaching them how to classify and approach different types of questions. Word choice can have a significant impact on the accuracy and narrative of a proof. How can I emphasize the importance of word choice without sounding like a broken record? One challenge is to encourage students to learn when to use appropriate phrases. Each student develops an individual writing style, but before that style development can happen, I thought I needed students to practice using basic building blocks of writing a proof. In short, how do I teach functional proof-writing phrases without making it too formulaic?

Free writes have been a useful tool during in-class group work. Activities that include free writes reduce the need to produce a “perfect” proof during the initial pass at a problem. I couched the activities in terms of gathering definitions, propositions, and first principles that may be relevant in constructing a particular proof. In abstract algebra, there are right and wrong answers – so the free writes were fine-tuned for gathering data within an axiomatic world.

The first half the semester focused on learning to write. Students came from a variety of proof-writing backgrounds, so we looked at more familiar examples of abstract algebra so that the subject matter could be a vehicle for developing proof writing. In the second half of the semester, the subject matter became more conceptual. Students encountered ideas they had not seen in other classes. Verbal and written communication skills then became a vehicle to understand highly abstract material.

Students who regularly came to office hours to work on learning to write and writing to learn improved significantly over the course of the semester. I noticed these students were able to take full advantage of group work in class and pinpoint areas of confusion much faster. For future Writing Fellows in mathematics, or perhaps any STEM field, I would recommend creating more low-stakes graded assignments for students to develop these skills. My current Math 307 class has to complete a Mathematics Portfolio in which they write short reflection essays on proofs from homework assignments, homework rewrites, and a minimum of one class presentation. The portfolio had multiple checkpoints during the semester, but the logistics of grading them all was challenging.