

Teaching Statement

JD Walsh III, January 30, 2015

Teaching mathematics is, first and foremost, about teaching. The student's perspective is paramount, because that is where learning begins. When I find ways to explain what I understand in terms that make sense to my students, they learn more, and find learning more joyful. Inspiring that experience is profoundly fulfilling. I am my best self, and my happiest, when I am helping others succeed. The happiness I gain from helping others is why I particularly enjoy teaching the skills required for success in mathematics. They are the same skills students need for success in life: reasoning through difficult issues, recognizing unsupported claims, and identifying patterns.

Often, the first thing I must teach is how to enjoy the learning process. To address that need, I use an approach that has more in common with group brainstorming than a traditional classroom, casting myself in the role of facilitator. I based this style on the teaching methods of Keith Johnstone, author of *Impro* and father of improvisational theater. As his writings make clear, "improvisation" does not mean coming in unprepared; just the opposite. Teaching with flexibility requires extensive preparation, because I must continually gauge my students' reactions and adapt my lesson plans to their needs. Sometimes I must prepare three explanations on a topic in case someone cannot follow the first two, but the extra effort always pays off. Together, my class and I gain a deeper understanding of the mathematics we cover. My students are attentive and responsive, recognizing that I am speaking with them instead of lecturing to them.

To remain aware of my students and their perspective, my teaching style must continually evolve. The first time I taught recitation, I worked problems at the board while the students took notes. I did not feel like I was connecting with my students, and I saw them struggle on every quiz and exam. The room felt asleep. The second time I taught recitation, I lectured "harder." I made review sheets and actively solicited questions. This helped the atmosphere of the room, but it seemed most of the benefit accrued to students who started the semester with the problem-solving skills necessary to succeed. I realized how easy it was to learn a solution but miss the principles behind it, like the difference between watching a dance and dancing.

I realized that in order to improve problem-solving skills in every student, I would need to bring hands-on mathematics center stage. By providing my students with mathematical exercises they could solve themselves, in an atmosphere where they could experiment without fear of criticism, I believed I could guide them along the path from observation to understanding. I created such an atmosphere by borrowing an idea from Wilbert McKeachie's *Teaching Tips*: using worksheets to create a form of mathematical "low-stakes writing."

My worksheets actively involve students with the problem-solving techniques that form the backbone of recitation. From start to finish, students in my recitation see math exercises, they discuss math exercises, and hear others talk about math exercises. Most importantly, they *do* math exercises. My worksheets are also low-stakes, because they aren't graded, or even handed in. These worksheets exist solely for the use and benefit of the students, an essential part of a judgment-free environment where students can explore and experiment with problem-solving strategies.

I create my recitation worksheets based on the topics covered in lecture. They are formatted like quizzes, both to reinforce the focus on problem-solving skills and to reduce test anxiety through familiarity. The students work in groups, fostering a sense of community — "us versus the material" — while I walk around, offering suggestions and keeping everyone on task. I encourage them to present individual or group solutions on the board, sharing their triumphs with their peers. When questions arise, we deal with them together, as a community, falling back on my expertise only as a last resort. Shared struggles and peer recognition combine to increase my students' mathematical comfort and confidence. Furthermore, such extensive practice ensures that their new-found confidence is justified. Together, these experiences lead my students to the most important lesson of all: the essence of learning is gain, not pain.