

Spring 2018 TSSA

Name: Corrine (Cory) Johnson

Department: Mathematics

Email: Corrine.johnson@csusb.edu

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Teaching Skill(s) Studied:

Incorporating high-impact practices in mathematics with a focus on writing intensive courses, innovative teaching practices in mathematics such as master-based grading, and inquiry-based teaching and learning

Impact on Current Teaching:

I learned about several different types of writing assignments that can be incorporated into a mathematics class. In my calculus class, I adopted a short essay where students discuss why they are taking calculus. This goes beyond the response that the course is required for their major, but rather pushes students to talk to faculty in their major to find out *why* the course is a requirement. This assignment draws connections between calculus and other disciplines and provides motivation for the study of calculus.

I have also adjusted some of the written homework problems I assign in calculus to allow for more student exploration (for IBL notes see <http://www.jiblm.org/>) and I have assigned problems that are more relevant to the students in the course. My goal is to engage students in the course content and to continue to motivate the study of calculus. For example, I have incorporated a problem, which provides a model for a measles outbreak and students use concepts from calculus to study the rate of change of the outbreak.

“Mastery grading” refers to a variety of assessment techniques that encourage students to pursue deep understanding of course content. Grades are based on mastery of objectives rather than accumulation of partial credit. It is up to the instructor to decide how to apply mastery grading into their courses (e.g. apply this concept to certain assignments versus structuring all assessments around mastery). There are several websites with resources for adapting master grading into the classroom (see <https://mbtmath.wordpress.com/> for collection of websites). I have adapted the broader concept of mastery grading into select assignments in my upper-division courses (such as Number Theory and Abstract Algebra). Selected homework problems are formulated around a content standard and consequently graded based upon a student’s mastery of that standard. I use a scale of 1 – 3 on each of these problems with a score of 2 indicating partial mastery of the topic. Multiple attempts are given on each problem to allow students to gain mastery of the standard. Mastery grading is a relatively new pedagogy for me and I am continuing to learn best practices for adaptation into my classroom.