A STUDENT-CENTERED APPROACH TO MATH112

Improve student learning by incorporating research-based inclusive classroom strategies

We established a professional learning community to explore and address some of the challenges with Math 112, Functions and Algebraic Methods, with particular attention to developing, implementing, and testing research-based practices and activities designed to improve student learning and classroom environments.

**CHALLENGES**

- In a department where there is not only a large student load, but also a large faculty pool, maintaining consistency between sections is a challenge.
- Inclusive classroom strategies effective in small classes are difficult to implement in a large lecture hall setting.
- Students come to Math 112 with a variety of background experiences, attitudes, and beliefs about mathematics.
- Students entering college mathematics courses may not be familiar with study strategies conducive to success.

**OUTCOMES**

This work is in the early stages, but so far there is anecdotal evidence that the changes have helped create a more open and welcoming classroom atmosphere, and successful students are reaching a deeper level of understanding than we’ve seen in the past.

As we share our work and ideas with our colleagues, we are encouraged that it has inspired discussion and movement in the math department and the university to help improve these courses.

**ACTIVITY**

- Identified core problem areas and developed learning progressions for use by other instructors and students.
- Worked to establish a common scope for the course.
- Incorporated student-centered instructional strategies including groupwork on rich tasks, exit tickets, and think-pair-shares.
- Collaborating with the Tutoring Center to incorporate activities designed to help students develop mathematics study skills into the Math 112 curriculum.
- Designed and implemented formative assessments connected to learning targets and success criteria.
- Used group norm setting to create and nurture inclusive classroom environments.
- Developed and implemented metacognitive activities to promote student reflection on their own preparation and attitudes.
- Incorporated activities designed to foster growth mindsets about mathematics.

**NEXT STEPS**

We continue to design, test, and refine activities, and explore how to better make use of the wide variety of campus supports available in ways that most benefit Math 112 students.

We plan to continue researching and collecting data to learn how best to help our students master the material.

We are actively participating in the larger departmental discussions around improving our 100-level math courses. Topics include changing instructional practices, textbooks, training, TAs, cohorts, placement strategies, inclusivity, class meeting structures, test time, tutoring, and study groups.

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