

## Students' Experiences in an Undergraduate Mathematics Class: Case Studies from one Student-Centered Precalculus Course

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*Using evidence-based practices in a large undergraduate mathematics classroom demands further investigation as there is still not significant work in this area. Results from this case study show that students perceived that their participation in student-centered instruction in an undergraduate Precalculus course, was helpful to their learning. The results also suggest that students demonstrated positive attitudes in regard to the collaborative efforts active learning components including Team Activities were utilized in this course and that the strategies were considered useful and important by the students interviewed.*

*Keywords:* Large Scale Classrooms, Precalculus, Evidence-Based Practices

In general, students have demonstrated greater gains in achievement and positive changes in affect when introduced to student-centered instructional strategies (Freeman et al., 2014; Kwon, Rasmussen, & Keene, 2005). However, there has not been significant work done to give a voice to students in these courses. Being able to show the effects these strategies have on students' perceived experiences in particularly large classes is an important contribution to the RUME community. The goal of this study was to understand the experiences of 5 students in a large-lecture Precalculus course where active learning strategies, such as the use of Team Activities and Clickers, were used. The research question was: What are students' perceptions of their experience in a large-scale Precalculus course where active learning strategies are used?

This is a multiple case study in a large Precalculus course at a southeastern university. The course included lecture and a computer lab component and introduced team activities and conceptual clicker questions designed to be completed in groups. The results are presented as 5 narratives to tell the stories of the students' perceptions of their experiences in this large-scale Precalculus course where student-centered instructional strategies are present (Creswell, 2013). Data collection included interviews and pre- and post-surveys. Interviews were transcribed and then coded using open coding techniques (Strauss & Corbin, 1998). Interview and survey responses were analyzed and reconstructed as a narrative to demonstrate these experiences.

For these 5 participants, it was most common that the Team Activities were classified as the favorite part of the course. Most of the students enjoyed collaborating and problem-solving with their peers. They also liked how it seemed relevant to real-life and was different than the procedural-type learning that they received from lectures and Smart Lab. The students in this study expressed mostly positive attitudes towards these student-centered learning strategies, in addition to demonstrating a similar change in attitude from a pre- to post-survey that was given to them at the beginning and end of the course.

Overall, we found that it is possible to bring student-centered learning strategies to a large-scale undergraduate class. To implement these strategies successfully, we suggest starting with a few activities and then slowly adding more activities to the course.

## References

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