

Linking a Laboratory Science with Intermediate Algebra – A Progress Report

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Introduction

Many students struggle with math in general and a large number of our students test into lower levels of math than they expected. The original concept was to integrate laboratory experiences with a math class. The goal was to encourage group work and problem solving around the math to reinforce the math concepts. It was also hoped that some students would be encouraged to consider further study in STEM areas.

Methods

Denise Hum, a full-time math instructor and Gabe Prochter, an adjunct astronomy instructor, were given non-instructional assignments in the spring of 2009 to determine what math class to link to an astronomy lab class. Astronomy was chosen because of the quantitative nature of astronomy, the hands-on nature of the possible experiments and the fact that, at Cañada, the astronomy lab is a separate class and no curriculum revision would be needed for this pilot.

Working together, Denise and Gabe determined that the experiments work best with intermediate algebra. The curriculum in the math portion was enhanced with examples from astronomy and the experiments in the astronomy lab were selected and modified to illustrate the math concepts as well as the astronomy concepts.

The combined ASTR 101 with MATH 120 was scheduled to pilot in the spring of 2010. The classes were scheduled for Tues/Thurs because the 2-day/week scheduling of algebra classes has been very popular with the students. In addition, the classes were scheduled in the same room, so that Denise and Gabe could split up the time in a way that worked best for them and the particular experiments being done each week.

The pilot had an enrollment limit of 30 and was full by the first day of class. The enrollment on March 1 was 27.

Student Feedback

"I chose to enroll in the class because it seemed that I was going to have fun doing labs based on the math portion that we do, and it was actually right!!!"

"The fact that the math is somehow reinforced in the astronomy portion to makes you more prepared in your math class."

"I like being able to put the equations we learn to use in astronomy, it really feels good to make that connection. It builds my confidence in math."

"I think working in groups is the only way to do it, when we work together, we all try and get onto the same level of comprehension of what were doing..."

Things that are working

- This learning community, combining an astronomy lab and intermediate algebra, does not cost more than the individual classes and offering this in the future is simply a matter of scheduling. The only down side is that the enrollment limit for the algebra class is reduced from 40 to 30 to match the enrollment limit for the astronomy lab.
- Students enjoy working in groups. They have developed a sense of community and work together both in class and out.
- Students have a deeper understanding of the math that they are learning.
- Students like that they can see a use for math outside of math class.

Struggles

- Time & attendance – The classes meet from 8:10 am to 12:25 pm on Tuesdays and Thursdays. Regular attendance has been a struggle for students.
- Timing – Students would like a little more time between learning a math concept and applying it in astronomy
- Some students are struggling to see the connection between the math and the astronomy.
- Students require more background knowledge in astronomy topics since only a few are also enrolled in the lecture course.

Conclusions

The students have overall responded positively to this learning community. They like the real-life math applications and some indicated that it has generated some interest in science.

Because this is the first semester that we are teaching these paired classes, we've learned a lot along the way.

Two Faculty One class

