

Title: Incorporating quantitative literacy and a function and data approach to teaching Intermediate Algebra. **Project Member:** Beth Edmonds

Describe the problem, issue, or area of interest and the context. It has been my observation that many students enrolled in an Intermediate Algebra course have done so for one of two reasons:

- 1) The student has taken and failed Intermediate Algebra at least once before, or
- 2) The student struggles with mathematics in general and has for years.

Define your desired goals, or “outcomes.” My goal for this project was simply to build a coherent, student-friendly 5-day-a-week Intermediate Algebra course that covered the curriculum in a way that was different from what the students had seen before, was applicable in later mathematics classes, used real-world examples in a way that tied mathematics to every day life, used calculator technology, and presented students with a chance to understand why they do some of what they do.

Describe your “indicators” of success. Success in meeting my stated goal will be very difficult to quantify. The sample size was small (only 12-15 students) and I had not taught Intermediate Algebra in a traditional format for the 5-day-a-week class before so could not compare previous success/failure to current success/failure. Instead, I relied on student input (both formal and informal) and my "gut" feeling as the course progressed. In addition, I relied on input from colleagues in my department. I had colleagues observe my Intermediate Algebra several times. On the final visit, they administered a poll in which the students were asked their opinions on the class.

Describe your project. For this project, I rewrote the curriculum for my Intermediate Algebra class to include the stated course outcomes as required by my department with an added quantitative literacy/data component as well as stressing the idea of functions. In the process I used the graphing calculator quite often. This involved writing prepared notes for the students as they did not have a text to follow and writing homework assignments. After about 6 weeks I was able to refer to the course text about every other homework assignment (we adopted the Carson, Gillespie, Jordan 2nd edition from Addison/Wesley). However, every homework assignment included problems that were not in the textbook.

Describe your results. I felt that this project was very successful. I met my stated goals of providing an Intermediate Algebra course that was

- ✓ *coherent* - This course is not choppy as many textbooks are.
- ✓ *student-friendly* - We introduce all the topics for the semester at the beginning and then revisit each topic at least once as we build on it. In this way, students have seen the material several times and have a way to build cognitive threads from new material back to old familiar material.
- ✓ *different* - The course was definitely different.
- ✓ *applicable* - Students taking my Intermediate Algebra course will have a distinct advantage to students in a traditional course in terms of concepts, notation, and terminology.
- ✓ *connected to the real-world* - Almost every lesson for at least the first 4 weeks begins with a real-world model which showed a relationship between the mathematics and something the students had seen before. This trend is continued throughout the semester but occurs less frequently as we move along.
- ✓ *sensitive to the students' needs to understand why* - I have found that most students don't need to understand how the material applies in the real world if they can just find success. However, I think part of their achievement is rooted in their ability to connect what they are learning to what they have already experienced.

Describe your evaluation methods. I have used periodic, informal, unannounced polls of the students. Once every two weeks I ask the students to answer 5 questions relating to the course and their perceived achievement. The questions (which are different each time) are designed to target student perceptions of the class and are asked so that all answers are anonymous. In addition, I had two of my colleagues in class several times. On their final visit they will use the last 15 minutes of class to discuss with the students their experience in the class via questions that were predetermined by me. Also, since students who enroll in this five-day-a-week class tend to be special-needs students, I will consider a high number of students who pass the course and perform well on the departmental final a success.