

# Ensure Students Are Learning: Faculty Descriptions of Innovative Teaching Practices

## Integrated Workbook Connects Algebra to Real-Life Applications

### Innovative Teaching Practice Description:

Guided instruction for this course follows a faculty-developed workbook, designed to motivate students in thinking about the practical uses of algebra instead of simply focusing on learning how to solve equations. The instructor refers to this as “algebraic thinking versus learning algebraic techniques.” For example, asked to think about credit card solicitations they receive in the mail, students compare two different types of offers to see which one would be the better choice based on fees, interest rates, and whether or not they could carry a balance. Students are also encouraged to think through different scenarios in which one credit card may work for one person but not another.

All lessons offered in the workbook share a common structure—students grapple with real-world mathematical scenarios and think through how to find an answer. At times, finding an answer may require using a specific algebraic technique; in most cases the instructor can help guide the students to find an answer using different types of mathematical strategies. As such, the course blends elements of finance, logic, risk/probability, and statistics. The workbook integrates learning activities for each concept; the instructor introduces the concepts at the beginning of a class, and then the students work together in groups to solve the problems. To

encourage engagement during any class activity or discussion, the instructor uses notecards with students’ names to randomly select a student to answer a question. Students know that this will happen several times in a class and must be prepared for the instructor to call on them at any time. However, students have the opportunity to “call for a consult,” meaning they have 30 seconds to consult with classmates before answering. The problems in the workbook become increasingly more complex, which enables scaffolding—building on concepts and ideas students have already learned.

Overall, the workbook is a collaborative effort among math faculty and faculty in other disciplines. While the math faculty led the development of the workbook, they consulted with faculty in psychology, sociology, and business to understand the types of skills students needed to have mastered upon entering a statistics course. This information allowed the math faculty to work backward to develop a workbook that would help students acquire skills necessary for success in statistics courses (should they choose to continue on the statistics math pathway), while also helping them learn to think about math through real-world applications.