

Product Name MyMathLab

Course Name College Algebra

Course Format Hybrid: One 100-minute lecture and three required lab hours per week

### Key Results

In a hybrid redesign of the College Algebra course where populations are separated and taught in groups according to their goal for the course (terminal or prerequisite), average pass rates increased by 17.6 percent (10.6 percentage points)—from an average preredesign pass rate of 60.2 percent to a full implementation average pass rate of 70.8 percent.

### Submitted by

Marianne Morea, Math Redesign Coordinator

### Course materials

MyMathLab and *College Algebra*, Sullivan

### Setting

SUNY College at Old Westbury, part of the State University of New York system, is a dynamic and diverse public liberal arts college on Long Island. The school serves more than 4,500 students in class sizes that average 22 students. The school's one-year retention rate for students entering in fall 2013 is 86 percent; four- and five-year graduation rates for students entering in 2009 were 22 percent and 34 percent, respectively.

College Algebra covers factoring polynomials, rational and algebraic expressions, exponents and radicals, linear and quadratic equations, complex numbers, inequalities, functions and their graphs, and systems of equations.

### Challenges and Goals

Faculty at SUNY Old Westbury noticed that two groups of students took the College Algebra course: those using it as a prerequisite for other math and science courses, and those using it as a terminal course to fulfill their degrees. Students taking College Algebra as a terminal course typically did not pass it as quickly or at as high a rate as the other students. As a result, instructors were unable to cover as many topics as necessary for those who needed it as a prerequisite. Morea and colleagues hypothesized that by separating the two populations, the course would be strengthened, and student performance would improve.

### Implementation

MyMathLab was first implemented at SUNY Old Westbury in 2007 when the college's provost, formerly of Louisiana State University, recommended the program based on that school's success with it.

Marianne Morea, redesign coordinator, and her colleagues adopted MyMathLab and the basic LSU implementation model with changes to accommodate the specific needs of their students. For example, unlike at LSU, SUNY Old Westbury offers students partial credit on lab attendance.

On the first day of class, students are divided into two groups of between 25 and 40 students each: those taking the course as a terminal course (proficiency) and those taking it as a prerequisite for other math or science courses (prereq). Each group meets separately under the same instructor.

Students who score 80 percent or more on the first test are exempt from the lab requirement. If their scores drop as the semester continues, they may be required again to attend lab.

Homework, quizzes, and tests are delivered via MyMathLab. While students may complete homework and quizzes from anywhere, tests and the final exam are taken in the school's math lab. They are also scheduled, proctored, and password protected with blocked access using MyMathLab's browser lockdown feature.

All assessments have fixed due dates. Homework assignments that are submitted up to a week late incur a 10 percent deduction. There are 10 to 11 quizzes per semester; the eight highest scores are counted toward the final grade and no late submissions are allowed.

Students are offered unlimited attempts on homework and three attempts for each quiz. They have no access to learning aids during quizzes, and only the highest score is counted.

*After implementation, pass rates in the redesigned courses rose from 68.5 to 72.2 in the fall and 60.8 percent to 67.1 in the spring.*

In addition, students must complete a review homework before every test. To promote that the review homework is taken seriously, each student’s review scores are tallied and the average score is counted as a test.

**Assessments**

- 40 percent MyMathLab test grades (five)  
*(Three of these are proctored and password protected tests; two are review assignments. Students may drop one test grade if they have fewer than three absences from lecture.)*
- 30 percent MyMathLab final  
*(Proctored, password protected)*
- 10 percent MyMathLab quizzes
- 10 percent MyMathLab homework
- 10 percent Lab attendance

**Results and Data**

A chi-square test of independence was performed to examine the relation between fall pass and fail rates pre- (AY 02/03–FY 08/09) and post- (AY 08/09–AY 12/13) redesign. The relation between these variables was significant,  $\chi^2 (1, N=3,803) = 6.16, p < .05$ . Academic pass rates increased from 68.5 percent prior to redesign to 72.2 percent after redesign (Figure 1). Grades of C or better were considered passing for all semesters included in the data analyzed for this report.

A chi-square test of independence was performed to examine the relation between spring pass and fail rates and pre- (AY 02/03–FY 08/09) and post- (AY 08/09–AY 12/13) redesign. The relation between these variables was significant,  $\chi^2 (1, N=2,989) = 12.69, p < .001$ . Academic pass rates increased from 60.8 percent prior to redesign to 67.1 percent after redesign (Figure 2).

Retention rates remained streaky in fall semesters (88.6 percent) before and after redesign. A chi-square test of indepen-

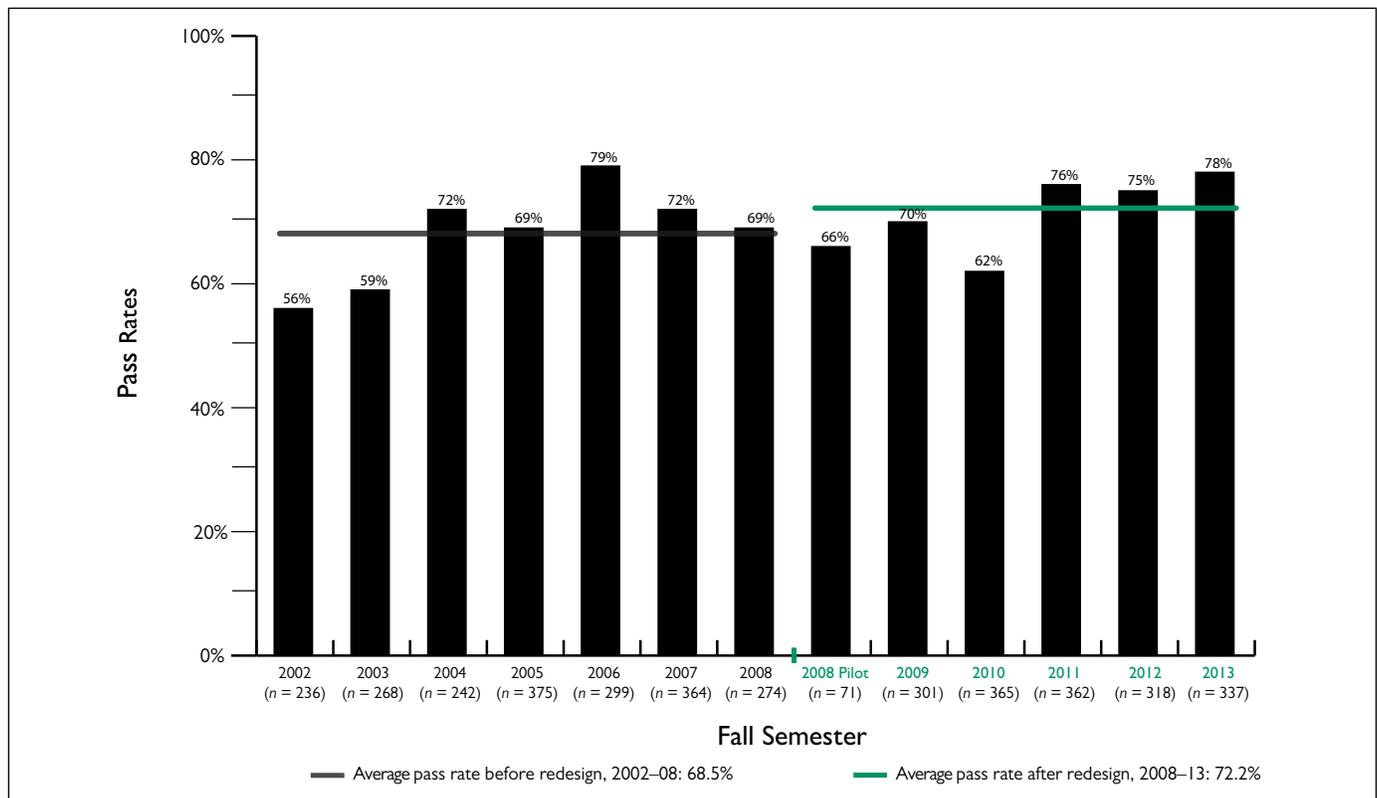


Figure 1. College Algebra Pre- and Post-Redesign Fall Pass Rates, 2002–13 (n = 3,803)

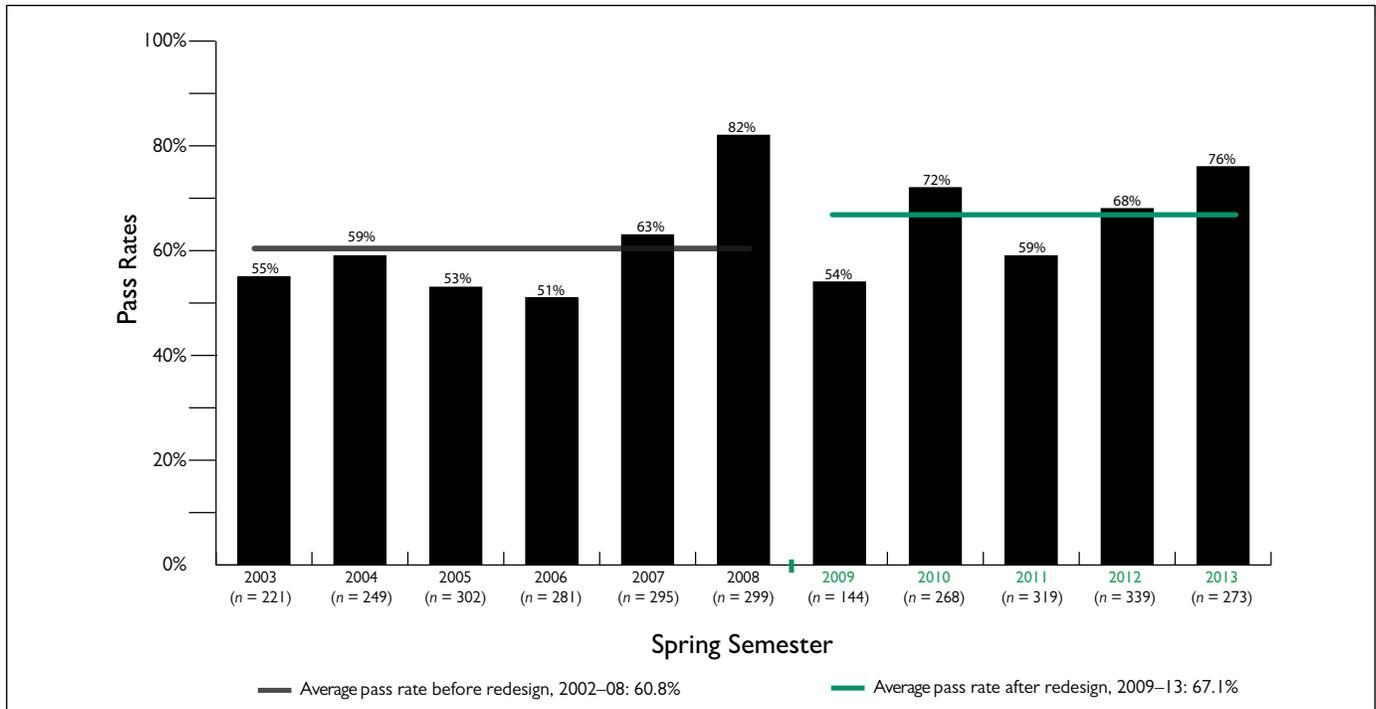


Figure 2. College Algebra Pre- and Post-Redesign Spring Pass Rates, 2002–13 (n = 2,989)

dence was performed to examine the relation between spring retention and withdraw rates pre- (AY 02/03–FY 08/09) and post- (AY 08/09–AY 12/13) redesign. The relation between these variables was significant,  $X^2(1, N = 2,989) = 4.10, p < .05$ . Academic retention rates increased from 82 percent prior to redesign to 84 percent after redesign.

### The Student Experience

Results from a student survey designed and conducted by Morea in the redesigned course indicate that responders appreciate the redesign format. Morea maintains that the majority of respondents agree that they learned more from working independently with the support of MyMathLab and tutors than from listening to a lecture. Morea also reports that students acknowledged in the survey that they like attending lecture one day per week and working on homework when it is convenient for them.

In addition, Morea reports that most respondents believe that they performed better in the redesigned format than they would have in a traditional classroom, and more than 70 percent of those responding felt they were prepared to progress to the next-level course. Although Morea recalls students

complaining about the quantity of work and lab hours required of them, she reports that 55 percent of responders agreed that they needed to complete that amount of work in order to master the material. According to Morea, students love the software and the support they now receive, “Before they had to search us out for help. They know we’re here now.”

### Conclusion

Morea and her colleagues are extremely happy with both MyMathLab and their redesigned course, which they believe is no longer weakened by the need to water down some topics or not cover others at all. “When I originally agreed to do the redesign, I wasn’t convinced it would work,” she says. “Now I wouldn’t go back.”

Morea feels every student receives the attention and teaching that he or she needs and, as a result, average pass and retention rates have increased. The redesign also has improved the reputation of the math department—other departments on campus notice its success and appreciate what they’ve created. “The school supports our program so much,” she says, “that they’ve put their money where their mouth is and renovated the campus library to include a larger computer lab.”

Implementation and results case studies share actual implementation practices and evaluate possible relationships between program implementation and student performance. The findings are not meant to imply causality or generalizability within or beyond these instances. Rather, they can begin to provide informed considerations for implementation and adaptation decisions in other user contexts. For this case study, mixed-methods designs were applied, and the data collected included qualitative data from interviews, quantitative program usage analytics, and performance data. Open-ended interviews were used to guide data collection.