SUNY COLLEGE AT OLD WESTBURY

Old Westbury, NY

Product Name	MyMathLab
Course Name	PowerTrack Math (Elementary Algebra)
Course Format	Hybrid: One 100-minute lecture and three required lab hours per week

> **Key Results** In a hybrid redesign of developmental math where students meet for lecture once a week and spend three hours per week in the computer lab, of the 91 percent of first semester completers who took the subsequent course the very next semester, 92 percent passed the next course.

Submitted by
Marianne Morea, Math Redesign Coordinator

Course materials
MyMathLab and *Elementary Algebra: Early Graphing*, Angel

Setting

SUNY College at Old Westbury is a dynamic and diverse public liberal arts college and part of the State University of New York system. With just about 4,500 students, SUNY College at Old Westbury serves as the only public liberal arts college on Long Island. The school's one-year retention rate for students entering in the fall of 2013 was 86 percent, and graduation rates for students entering in 2009 were 22 percent (four-year graduation rate) and 34 percent (five-year graduation rate).

The "PowerTrack Math" course is intended to develop an appropriate level of mathematical literacy to prepare the student for college level courses in mathematics (college algebra, statistics or an alternative) as well as courses in other disciplines. The course covers numerical, algebraic, and graphical problem solving and includes real number arithmetic as well as topics in Introductory Algebra.

Challenges and Goals

The Elementary Algebra course at SUNY Old Westbury had poor passing and retention rates, and the Provost wanted them to improve. Having heard about the redesign at Louisiana State University, the Provost mandated that the department redesign or lose the course. Marianne Morea, redesign coordinator, hypothesized that creating a hybrid course would improve student retention and pass rates.

Implementation

Responding to the Provost's mandate to improve outcomes in the Elementary Algebra course, Morea and her colleagues decided that they would start with the LSU implementation model and make some changes to fit their students and school. They created "PowerTrack Math," which is Elementary Algebra content taught in a hybrid format, where students meet for one 100-minute session in the lecture hall each week and spend three hours in the math lab working on their math assignments in MyMathLab. Unlike LSU, SUNY Old Westbury offers students partial credit for their lab attendance, so if they attend lab for 90 minutes one week, they get half credit.

Students take all homework, quizzes, and tests in MyMathLab. Homework and quizzes can be done anywhere, but tests and the final are proctored in the math lab. The course has fixed due dates, and all homework assignments have a 10 percent deduction if submitted up to 1 week late. The courses typically have 10–11 quizzes per semester, and the top eight are counted toward the student's grade, so no late submissions are allowed.

The department allows unlimited submissions for the homework and three submissions for each quiz. They take the best score of the three attempts, and students have no access to learning aids during quizzes. Tests are scheduled, proctored, and password-protected with blocked access using the browser lockdown feature in MyMathLab.

In addition, the department assigns a review homework in MyMathLab before every test and then averages those review homework scores to count it as a test. The department believes that the test-score incentive helps students take the review homework seriously.

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

Upon implementation of MyMathLab, SUNY Old Westbury immediately saw improvements in pass rates. For fall semesters leading up to the implementation of redesign (2002–2006), pass rates averaged 69.6 percent ($n = 540$). As shown in Figure 1, the first fall semester of the hybrid redesign resulted in a pass rate of 75.5 percent. Fall semester pass rates from 2007, the first semester of implementation, through 2014 have averaged 79.5 percent. Over spring semesters, post-redesign pass rates average 67.5 percent ($n = 465$), compared to an average pre-redesign spring pass rate of 61.7 percent from spring 2003 to spring 2007. Thus, fall post-redesign averages were up 14 percent, or 9.9 percentage points, and spring post-redesign averages were up 9 percent, or 5.8 percentage points.

A chi-square test of independence was performed to examine the relation between fall pass and fail rates and pre- (FY 02/03–FY 06/07) and post- (FY 07/08–FY 14/15) redesign. The relation between these variables was significant, X^2 (1, $N = 2,059$) = 21.89, $p < .001$. Academic pass rates increased from 69.6 percent before the redesign to 79.5 percent after the redesign.

A chi-square test of independence was also performed to examine the relation between spring pass and fail rates and pre- (FY 02/03–FY 06/07) and post- (FY 07/08–FY 14/15) redesign. The relation between these variables was significant, X^2 (1, $N = 1,170$) = 438.28, $p < .001$. Academic pass rates increased from 61.7 percent before redesign to 67.5 percent after redesign.

It should be noted that prior to fall 2010, a C– was considered passing and was the grade required to move on to a proficiency level course. In fall 2010 the requirement was raised to a C. While very few students earned C– grades in PowerTrack Math, according to Morea, there were many in the pre-redesigned Elementary Algebra course, which inflated that pass rate slightly. For this case study data analysis, all C-level grades were considered passing because C– data was not available for all semesters.
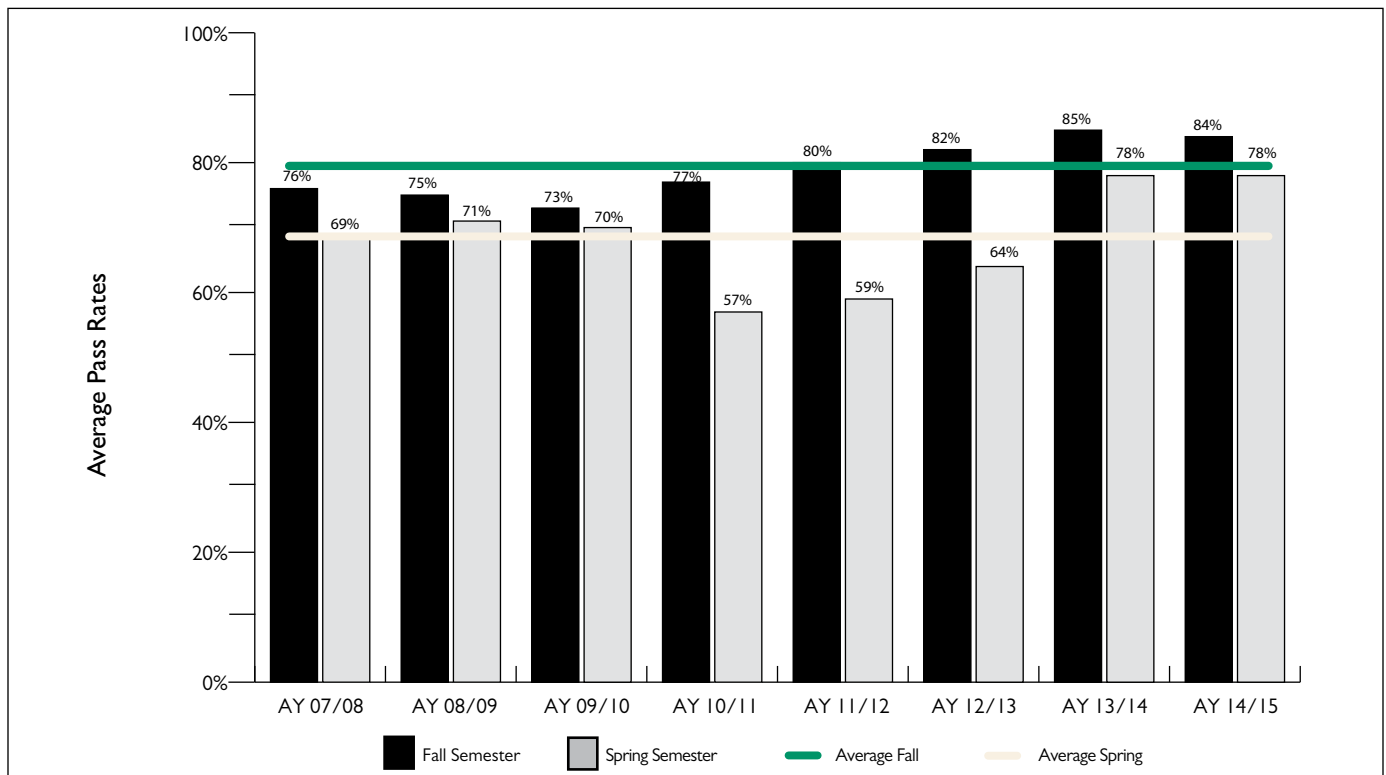

Figure 1. PowerTrack Math Pass Rates Post Redesign for Fall and Spring Semesters, Assessment Years 2007-08 Through 2014-15

*Students are incentivized to take the review homework seriously
when the scores are tallied, averaged, and counted as a test.*

Because pass rates increased significantly post-redesign, it was expected that retention rates would also improve. However, fall retention rates improved by .5 percentage points post-redesign, and spring retention rates dipped by 2.3 percentage points. A chi-squared test was run to examine the relation between pre- and post-redesign retention rates, and the difference in both semesters was found to be not significant (Fall: X^2 (1, $N = 2{,}059$) = .12, $p = .73$; Spring: X^2 (1, $N = 1{,}170$) = 1.44, $p = .23$.) One possible explanation for these results, Morea believes, is due to the fact that the pre-redesign MA0500 course was a 0-credit course. "It did not impact students' GPA, so very frequently, students did not bother to withdraw," she posits, "most likely in order to maintain enrollment for financial aid purposes. Our withdrawal rates were probably higher pre-redesign, but we can't know that because students didn't officially withdraw." According to Morea, this issue is part of the reason that PowerTrack became a two-credit course. It was felt by the committee that this would give it some impact on a students GPA and the department would be able to tell whether a student actually failed but tried or failed because they quit, or unofficially withdrew.

Finally, Morea believes that what's more telling about the success of the redesign is the success she reports students are experiencing in the subsequent course. For first semester completers moving into the next course, Morea reported that 91 percent took the subsequent course the very next semester, and 92 percent of those students passed the next course. Though comparison data from her previous semesters were unavailable, according to Morea, this 92 percent pass rate was better than the previous developmental math course produced.

The Student Experience

According to a survey distributed to students in the redesigned course, responders appreciate the way the course is structured. More than 80 percent of students responded to the end of semester survey, reporting that MyMathLab was very helpful, and the tutors were helpful and encouraging. Responders also liked only attending one lecture per week and reported that having their instructors in the lab made it easier for them to keep in contact with the instructor.

Morea also believes students have a better work ethic and student attitudes have improved. "They know they're ultimately responsible for their learning this way. Previously, I think they thought it was our job to get them to learn. Now they know we're here to help them but we can't do it for them." Morea says that students like the course so much, in fact, that they strongly requested that other courses move into the same format, which led to the eventual redesign of the College Algebra course at SUNY Old Westbury.

Conclusion

Morea says that without support from the administration, the overhaul of their course would not have happened as quickly as it did. In addition, she reports that the school has experienced cost reductions for the course, which has led to the administration continuing to support tutors in the course, despite budget cuts across the campus. Moving forward, Morea says they plan to continue to monitor their students' progress and subsequent success to ensure they're still providing the best course possible. "I think we've done a great job so far, but we will continue to monitor and improve and change things as needed."

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.