

## Cleveland State Redesign Report Fall Semester 2008

### Developmental Math (DSPM) Totals

	Previous Fall Semesters	Fall 2008	% increase
Students Passing a DSPM Course	390 (of 711) or 55%	511 (of 705) or 72%	31% (121/390)
Students Exiting the DSPM Program	182 (of 327) or 56%	268 (of 340) or 79%	47% (86/182)

Comments: These statistics are the true measure of the success of the redesign project. A 31% increase in the number of students passing a DSPM course, combined with a 47% increase in the number of students exiting the developmental math program, is exactly the sort of improvement the redesign was aiming for. Mobility within developmental math was also a goal of the redesign project. Thirty seven students completed two or more developmental math courses in one semester, with thirty three of these exiting the developmental math program. Nine students completed Intermediate Algebra and a college level math class in the same semester. Two students completed three courses in one semester, each completing over 1800 exercises. Clearly, the ability of the students to move quickly through the developmental math program has been achieved.

### Basic Math

	Previous Years	Fall 2008
Completion Rate (ABC/ABCDWF)	52%	65%
Passing Rate (ABC/ABCDF)	62%	71%
Course GPA	1.92	2.53
Performance on Common Test Items	73.3	86.2

Comments: The completion rate and passing rate represents a significant improvement over previous years. Students in Basic Math were required to do a mountain of work, with the average student performing more than 1000 exercises in the semester. This amount of work will serve to better prepare the students for success in their future math courses. The improvements in all of the course statistics are significant at the 90% confidence level and are promising of sustained improvement in future semesters.

### Elementary Algebra

	Previous Years	Spring 2008	Fall 2008
Completion Rate (ABC/ABCDWF)	52%	70%	67%
Passing Rate (ABC/ABCDF)	63%	80%	74%
Course GPA	1.95	2.88	2.63
Performance on Common Test Items	70.3%	86.2%	83.8%

Comments: The success rates in spring and fall 2008 are drastic improvements from previous years. The improvements in all of the course statistics are significant at the 95% level of confidence and are promising of sustaining the gains in student success made over the last two semesters.

## Intermediate Algebra

	Previous 5 Years	Spring 2009	Fall 2008
Completion Rate (ABC/ABCFW)	56%	71%	79%
Passing Rate (ABC/ABCF)	67%	80%	87%
Course GPA	2.02	2.85	3.20
Performance on Common Test Items	77.3%	90.1%	88.7%

Comments: The completion rate in Intermediate Algebra leaped from 71% in spring 2008 to 79% in fall 2008. The reason for this increase is primarily due to the ability of students to move quickly through the developmental math program. Thirty three students completed Elementary Algebra and Intermediate Algebra in the same semester, and this is the reason for the increase in the success rates of Intermediate Algebra. The improvements in all of the course statistics are significant at the 95% level of confidence, which points towards sustained improvement.

## Developmental Math Students in MATH Courses

	Completion Rate	Passing Rate	Course GPA
<b>Before Redesign</b>			
DSPM Students in MATH	71%	86%	2.39
Other Students in MATH	70%	83%	2.55
<b>After Redesign</b>			
Redesign DSPM Students in MATH	80%	93%	3.21
Other Students in MATH	71%	82%	2.93

Comments: This is one of the most important measures of success for any developmental math program. Students taking the redesigned developmental math courses were tracked manually to see how they did in the three redesigned MATH courses during the fall semester. The students taking redesigned developmental math classes outperformed the other students in every measure. This is the first time the developmental math students have done better than the other students, and by a wide margin. These results suggest the students exiting the redesigned developmental math program have been truly prepared to succeed in their college level math classes. Notice that the increase in success cannot be attributed to “easier courses”, as the overall success rates in the three redesigned MATH courses remained virtually unchanged at 72% overall. When examining the redesigned MATH courses individually, the developmental math students performed equal to or better than the other students in each of the three courses. The developmental math students under the redesigned format not only caught up to the other students in performance, but actually surpassed them. We believe this change can be attributed to a number of factors – students doing more work in the developmental math program than before, students fully engaged in learning in the redesigned format, the mastery learning approach in the developmental math program, and the change in the developmental math curriculum to place greater emphasis on topics like graphing, rounding, and technology. Finally, many students exiting the developmental program have overcome their fear of math through the volume of work they have done. These initial results of the redesign in developmental math show the potential of the new courses to better prepare students for success in college.

## MATH Totals

	Previous 5 Years	Fall 2008	% increase
Students Passing College Algebra, Finite Math, Statistics	245/340 = 72%	281/391 = 72%	36/245 = 15%

Comments: The increase in the number of students enrolling in and passing a math course is not the result of higher passing rates in these classes, which overall were the same under the redesign, but is the result of higher enrollment in MATH classes. This higher enrollment is due in large part to the increase in success rates in the developmental math program and the ability of students to exit the developmental math program and complete a MATH class in the same semester. More students completed Intermediate Algebra in spring and summer 2008 than in previous years, and over ninety percent of these will take College Algebra, Statistics, or Finite Math for their college level math course. Nine students completed both Intermediate Algebra and one of these three MATH classes in fall 2008. With a 47% increase in students exiting developmental math, the increase in enrollment in MATH courses should continue, and early enrollment numbers from spring 2009 indicate this is the case.

## College Algebra

	Previous 5 Years	Fall 2008
Completion Rate (ABCD/ABCDFW)	65%	74%
Passing Rate (ABCD/ABCDF)	82%	82%
Course GPA	2.26	2.89
Performance on Common Test Items	75.64	86.34

Comments: The improvement in the success rate is promising, as the passing rate had never been above 70% in the last five years. The redesigned course was similar in content and level of difficulty to previous years. We believe the gains in student success and learning are due to the increased student engagement in the new format. The gains in completion rate, course GPA, and performance on test items are significant at a 90% confidence level.

## Introductory Statistics

	Previous 5 Years	Fall 2008
Completion Rate (ABCD/ABCDFW)	79%	68%
Passing Rate (ABCD/ABCDF)	89%	84%
Course GPA	2.79	3.04
Performance on Common Test Items	79.6	83.3

Comments: The drop in the completion rate of Statistics was significant. This is likely due to the course being strengthened in terms of an expanded curriculum and increased difficulty level under the redesign. Faculty members felt the course was significantly harder than it had been in previous years. Some of the modules proved to be too time consuming for students to complete in one or two weeks. Having said that, clearly many students rose to the challenge and worked hard enough to complete the course anyway. Notice that even though the completion rate dropped significantly, the passing rate only fell slightly and the course GPA actually increased slightly. Given the expansion of the curriculum and greater difficulty of the course, it is safe to say these students learned more than students in past years. While the completion rate became significantly worse, the other changes in course statistics showed no significant difference from the previous years. Tweaking the course should eliminate the problems in the course, making it more acceptable to both faculty and students in future semesters.



## **Enrollment Strategies**

The continuous enrollment approach of the math department is clearly a success, with students able to complete two courses in one semester or complete one course and start in the next course. Many students have taken advantage of this option, as evidenced by forty six students completing more than one course in a semester.

Starting in spring 2009, the math department will try a new approach to low enrollment classes, offering multiple courses in the same classroom at the same time. In fall 2009 when the redesign project is expanded to include Basic Calculus and Precalculus, those courses will be offered at the Athens campus for the first time in many years due to this new strategy. The strategy will also be used at the Cleveland campus during class times that have had historically low numbers. This will enable the department to increase course offerings in several courses.

Continuing both of these strategies should allow the department to further expand course offerings. This should reduce scheduling roadblocks to students, enabling them to complete their degree requirements sooner.

## **Reducing Costs**

There has been a shift in personnel over the last year. Since a faculty member retired, a staff person was hired for the Athens lab. Also, the staffing of the Cleveland lab shifted to five part time tutors instead of a full time staff position. The increased faculty productivity has enabled the department to eliminate the use of adjunct faculty members at the same time that course offerings are actually increased. Other savings include less copying due to online homework and testing. All of this has resulted in annual savings of over \$50000 as of fall 2009, which is a significant savings for a department of eight faculty members and one staff member.

## **New Courses**

Due to an additional \$15000 grant, the department will redesign three additional courses in spring 2009 and implement those courses in fall 2009. The three courses are Basic Calculus, Precalculus I, and Precalculus II. Once these courses are offered under the new format, approximately 95% of the students at Cleveland State taking MATH courses will be under the umbrella of the redesign project.

## **Problems and Challenges**

The redesign project was expanded in fall 2008, going from two courses to six courses and from one campus to three campuses. A number of problems were experienced along the way. IT and Financial Aid problems plagued the department almost every day for the first month. As a result, student frustration was apparent during this period and this definitely had a negative impact on the program. Three weeks into the semester, over 15% of the students hadn't registered at MyMathLab, and many of these were due to financial aid problems. IT problems occurred on almost a daily basis for the first five weeks of the semester. Students became frustrated as a result of these problems, which slowed their ability to work in the course. Also, a few problems were discovered in the courses as the semester went along. In spite of all of the problems, both the faculty and the students for the most part remained positive throughout the semester.

## **Summary**

The primary goals of the program were to increase success rates in the developmental math program, better prepare these students for success in college, and increase the ability of students to move quickly through the developmental math program, removing the roadblocks to success. All of this was to be done with an eye towards producing actual cost savings. So far, the project has to be deemed an overwhelming success.