Cañada College Research Brief

2013 Math Department Research Request

In an effort to measure the impact of past initiatives and improve the Math program through the use of data driven decision making, the Math Department has requested that the following research questions be examined:

- How do students who enroll in Math 120 perform in Math 200 compared to students who did not take Math 120?

- How do students who enroll in the accelerated version of Math 110 and Math 120 perform compared to their peers?

- How do students perform in Math 811, Math 110, Math 120, and Math 130?

- How do students who complete Math 811, Math 110, Math 120, and Math 130 perform in subsequent courses?

Research Question 1:

How do students who complete Math 120 perform in Math 200 compared to students who did not take Math 120?

Hypothesis

Despite having lower initial math placement scores, students who complete Math 120 before taking Math 200 will perform as well as their peers in Math 200.

Sample

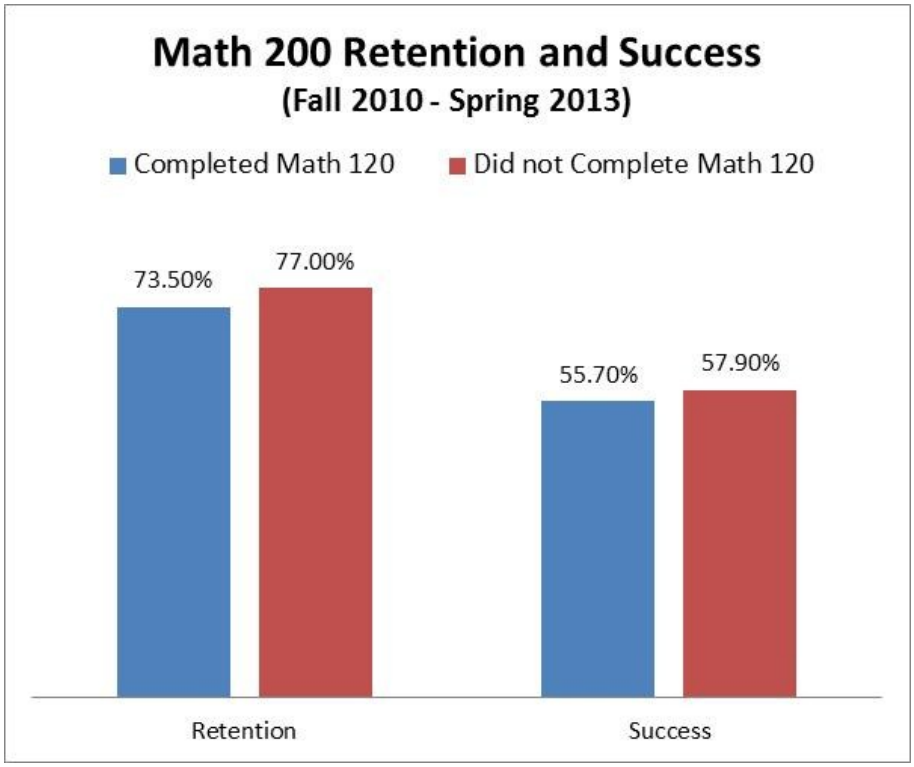
The sample (n=1604) included all students who enrolled in Math 200 in the Fall or Spring semesters between the Fall of 2010 and the Spring of 2013.

Methodology

Data was extracted from the San Mateo Community College District student database regarding student retention and success in Math 120 and Math 200 from Fall of 2008 to Spring of 2013. The data was exported into SPSS V.20 where cross tabulations were created, and chi square tests administered, to compare student retention and success in Math 200 between students who had completed Math 120 and their peers who had not.

Summary Findings

Students who did not complete Math 120 (n=1128) prior to enrolling in Math 200 had slightly higher rates of retention (77% vs. 73.5%, *p* =.143) and success (57.8% vs. 55.7%, *p* =.412) than their peers (n=476) who had completed Math 120. However the differences were not statistically significant at the .05 level.



Research Question 2: How do students who enroll in the accelerated version of Math 110 and Math 120 perform compared to their peers?

Hypothesis

Students who enroll in accelerated versions of Math 110 and 120 will perform as well as their peers in other versions of Math 110 and Math 120. (i.e. Differences in retention and success rates will not be statistically significant)

Samples

The samples included all students who enrolled in Math 110 between Fall 2010 and Spring 2013 and all students who enrolled in Math 120 between Fall 2010 and Spring 2013.

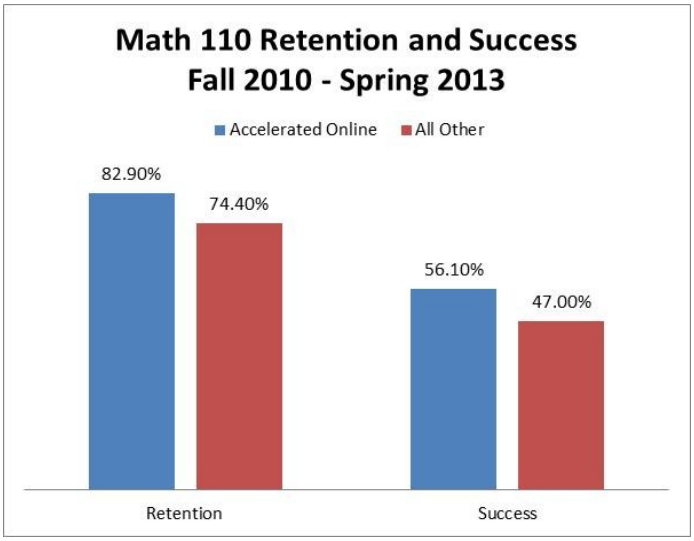
Methodology

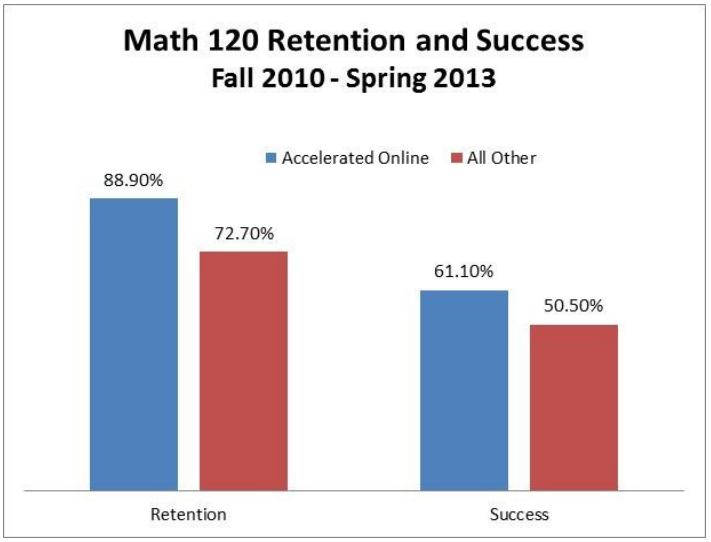
Data was extracted from the San Mateo Community College District student database regarding student retention and success in Math 110 and Math 120 . The data was exported into SPSS V.20 where cross tabulations were created, and chi square tests administered, to compare student retention and success of students who participated in accelerated math courses and those who did not.

Summary Findings

Students who enrolled in the accelerated version of Math 110 (n=41) had higher rates of retention (82.9% vs. 74.4%) and higher rates of success (56.1% vs. 47.0%) than their peers (n=1731) who had completed Math 110. Students who enrolled in the accelerated version of Math 120 (n=18) had higher rates of retention (88.9% vs. 72.7%) and higher rates of success (61.1 vs. 50.5%) than their peers (n=2205) who had completed Math 120. However the samples from the accelerated courses were small, and the results were not statistically significant at the .05 level.

*Note: The majority of the students who were successful in the accelerated Math 110 and Math 120 between the Fall of 2010 and Fall of 2012 have **not** gone on to take a higher level math courses (Six students went on to take Math 200, with four completing, and one student went on to take, and be successful in Math 130, 251, 252, and 253.)*





Research Question 3:

How do students perform in Math 811, Math 110, Math 120, and Math 130?

Samples

The samples included all students who enrolled in Math 811, Math 110, Math 120, and Math 130 between Fall 2008 and Spring 2013.

Methodology

Student data from Fall 2008 - Spring 2013 was extracted from the San Mateo Community College District student database. The data was exported into SPSS V.20 where cross tabulations were created to describe aggregate student performance of each of the sections.

Summary Findings

All of the sections have similar rates of retention and success. Students in Math 811 had the highest retention rates, while students in Math 130 had the lowest retention rates. Students in Math 130 also had the lowest success rates, however the difference in the success rates between students in Math 130 and students in the other sections was largely a product of differences in retention rates between the courses, rather than a difference in the performance of students who actually completed the course.

Table: Fall 2008 - Spring 2013: Math Course Enrollments, Retention, and Success.

Section	Enrolled	Retained	% Retained	Success	% Success
811	2229	1728	77.52%	1056	47.38%
110	2699	2022	74.92%	1290	47.80%
120	3394	2508	73.90%	1712	50.44%
130	554	398	71.84%	250	45.13%

Research Question 4: How do students who complete Math 811, 110, 120 and Math 130 courses perform in subsequent courses?

Samples

The sample included all students who were successful in one of the following Math courses in the Fall of 2010.

Methodology

Data was extracted from the San Mateo Community College District student database. The data was exported into SPSS V.20 where cross tabulations were created to describe the performance of each cohort in their in subsequent courses.

Summary Findings

Of the students who were successful in Math 811 in the Fall of 2010 (n=58), 43.1% (25/58) went on to complete Math 110 or 112 and 17.2% (10/58) went on to complete Math 120 or 122 at Cañada College by Spring 2013.

Students who completed 811 in Fall 2010 (n=58), Subsequent Courses

Section	Attempts	Retained (No)	Retained (Yes)	Retention Rate	Success (No)	Success (Yes)	Success Rate	Success Rate of Retained
110	25	7	18	72%	8	17	68%	94%
111	27	3	24	89%	8	19	70%	79%
112	20	9	11	55%	12	8	40%	73%
120	17	6	11	65%	9	8	47%	73%
122	3	1	2	67%	1	2	67%	100%
123	2	0	2	100%	0	2	100%	100%
130	3	1	2	67%	2	1	33%	50%
200	10	3	7	70%	4	6	60%	86%
222	1	0	1	100%	0	1	100%	100%
251	1	0	1	100%	0	1	100%	100%

Of the students who were successful in Math 110 in the Fall of 2010 (n=101), 48.5% (49/101) went on to complete Math 120 and 24.8% (25/101) went on to complete Math 130 or 200 at Cañada College by Spring 2013.

Students who completed 110 in Fall 2010 (n=101), subsequent courses.

Section	Attempts	Retained (No)	Retained (Yes)	Retention Rate	Success (No)	Success (Yes)	Success Rate	Success Rate of Retained
120	93	19	74	80%	44	49	53%	66%
122	8	3	5	63%	5	3	38%	60%
125	3	1	2	67%	2	1	33%	50%
130	9	3	6	67%	5	4	44%	67%
140	4	0	4	100%	1	3	75%	75%
200	33	8	25	76%	12	21	64%	84%
222	1	0	1	100%	0	1	100%	100%
241	3	0	3	100%	1	2	67%	67%
251	2	0	2	100%	0	2	100%	100%
252	1	0	1	100%	0	1	100%	100%
253	1	0	1	100%	0	1	100%	100%

Of the students who were successful in Math 120 in the Fall of 2010 (n=124), 9.7% (12/124) went on to complete Math 130 and 38.7% (48/124) went on to complete Math 200 at Cañada College by Spring 2013.

Students who completed 120 in Fall 2010 (n=124), Subsequent Courses

Section	Attempts	Retained (No)	Retained (Yes)	Retention Rate	Success (No)	Success (Yes)	Success Rate	Success Rate of Retained
130	22	3	19	86%	10	12	55%	63%
140	10	2	8	80%	5	5	50%	63%
200	83	19	64	77%	35	48	58%	75%
222	10	0	10	100%	3	7	70%	70%
241	5	0	5	100%	0	5	100%	100%
242	2	0	2	100%	0	2	100%	100%
251	11	4	7	64%	5	6	55%	86%
252	6	1	5	83%	1	5	83%	100%
253	2	1	1	50%	1	1	50%	100%

Of the students who were successful in Math 130 in the Fall of 2010 (n=29), 41.4% (12/29) went on to complete Math 200 and 34.8% (10/29) went on to complete Math 222 at Cañada College by Spring 2013.

Students who completed 130 in Fall 2010 (n=29), subsequent courses

Section	Attempts	Retained (No)	Retained (Yes)	Retention Rate	Success (No)	Success (Yes)	Success Rate	Success Rate of Retained
200	15	2	13	87%	3	12	80%	92%
222	12	0	12	100%	2	10	83%	83%
241	2	0	2	100%	0	2	100%	100%
251	11	0	11	100%	2	9	82%	82%
252	13	0	13	100%	5	8	62%	62%
253	3	0	3	100%	0	3	100%	100%
270	1	0	1	100%	0	1	100%	100%
275	1	0	1	100%	0	1	100%	100%