Office of
Research & Planning

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Research Briefs from the Office of Institutional Research
MATH-090 and 095 Success from Fall 2008 to Spring 2009

Purpose: The purpose of this brief is to illustrate the percent of students who successfully complete MATH-090 and MATH-095 the first time they take the course in the primary terms from Fall 2008 to Spring 2010. In addition, the report also shows the percent of students who successfully complete MATH-095 for students who successfully completed the MATH-090 prerequisite course first and for students who placed into MATH-095 through the assessment process.

Summary of Findings:
- The overall MATH-090 success rate in the primary terms from Fall 2008 to Spring 2010 was 50.5%
- The overall MATH-095 success rate in the primary terms from Fall 2008 to Spring 2010 was 59.4%
- In Spring 2010 students who had successfully completed MATH-090 had a statistically similar success rate in MATH-095 (62.0%) when compared to students who placed into MATH-095 (61.4%)
- Students who successfully completed MATH-090 were statistically significantly ($p < .05$, ES = .10) more likely to successfully complete MATH-095 (61.8%) than students who placed into MATH-095 (56.6%)

Methodology: Students were identified as taking MATH-090 or 095 for the first time the first semester in which they earned a grade on record (GOR) in the course. Accordingly, a student was included in the study if they earned their first GOR in MATH-090 or 095 in the following primary terms: Fall 2008, Spring 2009, Fall 2009, or Spring 2010. GOR is similar to being enrolled at census and refers to students earning one of the following grades: A, B, C, D, F, I, P, NP, or W.

Table 1 illustrates the success rates for students who earned a GOR in MATH-090 and 095 in Fall 2008, Spring 2009, Fall 2009, and Spring 2010. Success rate refers to earning an A, B, C, or P grade divided by the number of GOR. Tables 2 and 3 illustrate the success rate in MATH-095 by term and by how the student met the prerequisite for MATH-095. Students could have met the prerequisite by successfully completing MATH-090 (i.e. Success) or by placing into MATH-095 after completing the assessment process (i.e. Placed). In addition, a small number of students successfully completed MATH-090 and placed into MATH-095 prior to earning a GOR in MATH-095 (i.e. Placed/Success). "Unknown" was used for students who did not successfully complete MATH-090, place into MATH-095, or successfully complete MATH-090 and place into MATH-095 prior to earning a GOR in MATH-095.

Effect Size (ES) and Statistical Significance. The effect size statistic is commonly used in meta-analyses. A meta-analysis uses quantitative techniques to summarize the findings from a number of studies on a particular topic to determine the average effect of a given technique. One method of interpreting effect size was developed by Jacob Cohen. Jacob Cohen defined "small," "medium," and "large" effect sizes. He explained that an effect size of .20 can be considered small, an effect size of .50 can be considered medium, and an effect size of .80 can be considered large. Effect size is calculated by dividing the difference of the two means by the pooled standard deviation. It is important to mention that the number of students in each group does not influence Effect Size; whereas, when statistical

significance is calculated the number of students in each group does influence the significance level (i.e. "p" value being lower than .05). Accordingly, using Cohen as a guide, a substantial effect would be .20 or higher.

Findings: Table 1 illustrates the success rates in MATH-090 and 095 in the primary terms from Fall 2008 to Spring 2010. The success rate in MATH-090 has ranged from 46.9% in Spring 2009 to 55.5% in Spring 2010. In addition, the success rate increased from 46.9% in Spring 2009 to 55.5% in Spring 2010. The success rate in MATH-095 has ranged from 52.1% in Fall 2008 to 63.7% in Spring 2009. Moreover, the success rate increased from 52.1% in Fall 2008 to 60.8% in Fall 2009. Conversely, the success rate decreased from 63.7% in Spring 2009 to 62.0% in Spring 2010.

Table 1: MATH-090 and 095 Success Rates the First Time CHC Students Earned a Grade on Record in the Course from Fall 2008 to Spring 2010.

Term	MATH-090			MATH-095		
	#	N	%	#	N	%
2008/FA	178	357	49.9	261	501	52.1
2009/SP	120	256	46.9	262	411	63.7
2009/FA	161	323	49.8	329	541	60.8
2010/SP	157	283	55.5	251	405	62.0
Total	616	1,219	50.5	1,103	1,858	59.4

Note: "#" refers to the number of successful grades, "N" refers to the number of GOR, and "%" is the number of successful grades divided by the number of GOR and is the success rate.

Table 2 and Figure 1 illustrate the MATH-095 success rate for each primary term from Fall 2008 to Spring 2010 by how the MATH-095 prerequisite was met. In the first three primary terms students were substantially more likely to be successful in MATH-095 if they had successfully completed MATH-090 prior to taking MATH-095 than students who had placed into MATH-095. On the other hand, in Spring 2010 students who had successfully completed MATH-090 had a statistically similar success rate in MATH-095 (62.0%) when compared to students who placed into MATH-095 through the assessment process (61.4%).

Table 2: Success Rate in MATH-095 for Students who Placed into MATH-095 or Successfully Completed MATH-090 Prior to Earning a GOR in MATH-095 by Term from Fall 2008 to Spring 2010.

How Prerequisite was Met	Fall 2008			Spring 2009			Fall 2009			Spring 2010		
	#	N	%	#	N	%	#	N	%	#	N	%
Unknown	2	5	40.0	0	0	0.0	5	6	83.3	5	7	71.4
Placed	155	306	50.7	96	156	61.5	182	315	57.8	89	145	61.4
Success	102	187	54.5	159	244	65.2	138	216	63.9	155	250	62.0
Placed/Success	2	3	66.7	7	11	63.6	4	4	100.0	2	3	66.7
Overall	261	501	52.1	262	411	63.7	329	541	60.8	251	405	62.0

Note: "#" refers to the number of successful grades, "N" refers to the number of GOR, and "%" is the number of successful grades divided by the number of GOR and is the success rate.

Figure 1: Success Rate in MATH-095 for Students who Placed into MATH-095 or Successfully Completed MATH-090 Prior to Earning a GOR in MATH-095 by Term from Fall 2008 to Spring 2010.
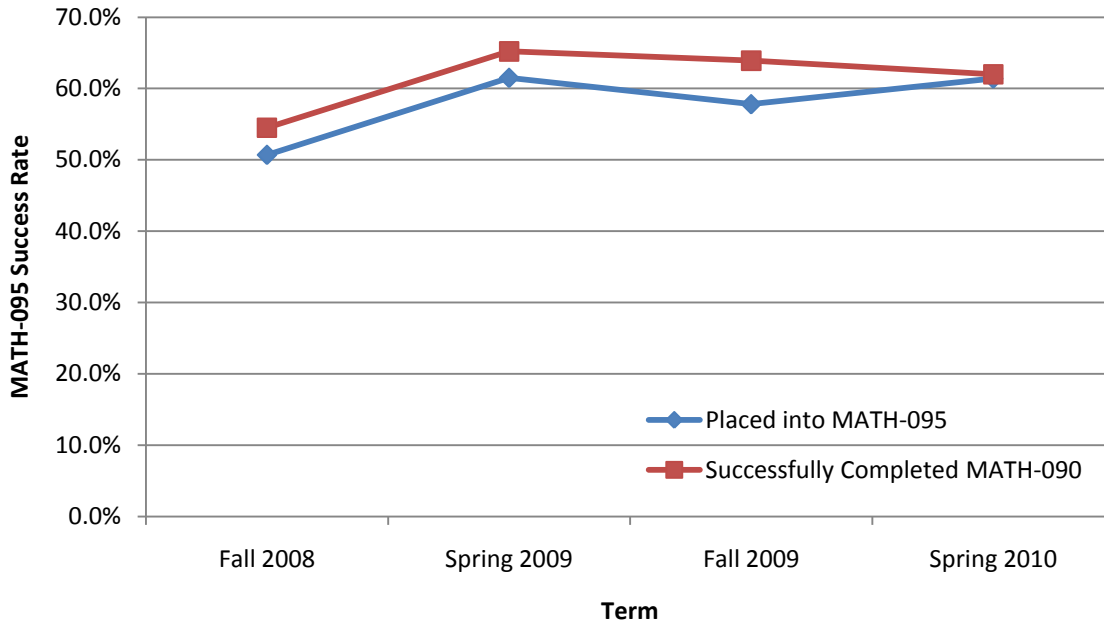

Table 3 shows the overall MATH-095 success rates for the four primary terms for students who placed into MATH-095 and for students who successfully completed MATH-090 prior to earning a GOR in MATH-095. Accordingly, MATH-095 success was compared for students who placed into MATH-095 with students who successfully completed MATH-090. Students who successfully completed MATH-090 prior to enrolling in MATH-095 had a statistically significantly ($p < .05$) higher success rate (61.8%) than students who placed into MATH-095 (56.6%).

Table 3: Success Rate in MATH-095 from Fall 2008 to Spring 2009 for Students who Placed into MATH-095 or Successfully Completed MATH-090 Prior to Earning a GOR in MATH-095.

Term	Unknown			Placed			Success			Placed/Success		
	#	N	%	#	N	%	#	N	%	#	N	%
2008/FA	2	5	40.0	155	306	50.7	102	187	54.5	2	3	66.7
2009/SP	0	0	0.0	96	156	61.5	159	244	65.2	7	11	63.6
2009/FA	5	6	83.3	182	315	57.8	138	216	63.9	4	4	100.0
2010/SP	5	7	71.4	89	145	61.4	155	250	62.0	2	3	66.7
Overall	12	18	66.7	522	922	56.6*	554	897	61.8*	15	21	71.4

Note: "#" refers to the number of successful grades, "N" refers to the number of GOR, and "%" is the number of successful grades divided by the number of GOR and is the success rate.
*Students who successfully completed MATH-090 were statistically significantly ($p < .05$, ES = .10, LL = .01, UL = .20) more likely to successfully complete MATH-095 (61.8%) than students who placed into MATH-095 (56.6%).