

Expanding High School Math Curriculum

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Abstract. Over four years ago, the math department at El Dorado High School was faced with a problem of an increasing number of students who were not successful in Algebra I. Those students were failing both in the first semester and second semester. Large numbers of students were taking only the required credits of math to graduate. Faced with this knowledge and knowing that graduation requirements for math were going to increase for future classes, the math department made a decision to create two new math classes: Transition Algebra was placed between Pre Algebra and Algebra I; and Transition Geometry was placed between Algebra I and Geometry.

By examining students' grades in Pre Algebra, Algebra I, Geometry in the three years prior to implementing the new math classes and the three years after students could take the new math classes, we have answered two main question: are students more successful in their math classes? And, have these two math classes met a need for our students that previously was unfilled?

1. Introduction

Until the class of 2009, students graduating from El Dorado High School were required to take two math classes and then one additional credit of math or science. Depending upon their preference, most students were opting to take the additional science class for their graduation credit. When the class of 2009 entered high school, graduation credits changed to three credits of math and three credits of science. The math department also felt there was an increasing number of students who were not successful in Algebra I. To meet both of these needs, the math department discussed several options. One option was a two-year Algebra I course. While department members felt this type of program had positive aspects, we did not believe our smaller student population would allow for both the traditional one-year Algebra I and two-year Algebra I courses to be offered.

Taking what we liked about the two-year Algebra I course – the chance for students to work on concepts at a more in-depth and slower pace than the traditional Algebra I course, two new classes were designed: Transition Algebra was placed between Pre Algebra and Algebra; and Transition Geometry was placed between Algebra I and Geometry. Transition Algebra teaches skills students will learn in first semester Algebra I, but in an entire year. Transition Geometry, while it follows Algebra I, mainly works with strengthening the skills students learned in the second semester of Algebra I and introduces basic Geometry terms and formulas.

Our research set out to identify failure rates in the three years prior to implementing the new classes for Pre Algebra, Algebra I, and Geometry classes, and the failure rates of all five math classes for the three years after students could take the new math classes.

2. Results

As shown in Table 1, failure rates for Algebra I ranged from the 10% to 30%. In other words, almost one-fifth of an Algebra class was not passing. The failure rates for Pre Algebra were even worse. Those started out at almost 50% and averaged 33%. One-third of Pre Algebra students were not successful in the current curriculum. With the implementation of the two new classes, some great accomplishments were realized during the first year. One of the first positives our department noted was as students were informed of their options; they choose to take another math class beyond just the requirements for graduation. Along with more options for students coming from the eighth grade into high school, we were able to put students who needed the Pre Algebra curriculum into the Pre Algebra course, not because we did not want them in Algebra I. This had been the previous practice. Too many students were placed into Pre Algebra not because they needed the curriculum, but because they were not ready for Algebra I. Transition Algebra now gave us another option for those students.

Table: 1
Failure Rates by Semesters for El Dorado High School

Term	Pre Algebra	Transition Algebra	Algebra I	Transition Geometry	Geometry
1 st Semester 2001-2002	53/109 = 48.7%		32/115 = 27.8%		8/80 = 10%
2 nd Semester 2001-2002	30/93 = 32.3%		17/78 = 21.0%		14/75 = 18.7%
1 st Semester 2002-2003	21/69 = 30.4%		35/149 = 23.5%		8/79 = 10.1%
2 nd Semester 2002-2003	43/95 = 45.3%		37/108 = 34.4%		9/74 = 12.2%
1 st Semester 2003-2004	9/47 = 19.1%		13/133 = 9.8%		9/86 = 10.5%
2 nd Semester 2003-2004	12/54 = 22.2%		16/119 = 13.4%		10/84 = 11.9%
1 st Semester 2004-2005	7/41 = 17.1%	5/61 = 8.2%	0/72 = 0%	2/51 = 3.9%	13/80 = 16.3%
2 nd Semester 2004-2005	18/48 = 37.5%	5/61 = 8.2%	5/69 = 7.2%	8/51 = 15.7%	10/80 = 12.5%
1 st Semester 2005-2006	5/41 = 12.2%	2/42 = 4.8%	17/117 = 14.5%	0/25 = 0%	6/72 = 8.3%
2 nd Semester 2005-2006	6/40 = 15%	4/42 = 9.5%	38/98 = 38.8%	1/25 = 4%	8/72 = 11.1%
1 st Semester 2006-2007	4/36 = 11.1%	4/66 = 6.1%	22/112 = 19.6%	4/51 = 7.8%	4/66 = 6.1%

Also, within that first year, we did not have a single student fail Algebra I first semester. The math department felt after the first year, the two new classes had been a success and were meeting their targeted students' needs. However, if you continue to look at Table 1, you will notice the failure rate in Algebra I have again been increasing. We believe this is a result of students overriding teacher recommendation for placement in math classes.

3. Conclusions

After this research, we agree the implementation of two new math classes with the curriculum at our high school is successful. We will continue with these classes, changing their curriculum when needed to better reflect the Algebra I text. As a result of this research, the math department at El Dorado High School has modified enrollment procedures so that a student must have a parent come to the Guidance Office and sign a consent form to change a teacher recommended math class placement.

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