

## METROMATEMÁTICAS Evaluation Studies: Summary. An Analysis of Impact

Metromatemáticas has conducted four studies of the impact of the curriculum and program since its implementation in February 2012. Three studies involved participating students. One evaluated the extent employees working in the local manufacturing plants learned skills and knowledge required for their jobs. All studies had positive results.

**Table I**

### Mexico National Math Test Results

**Progress of Treatment Group (Students who participated in Metromatemáticas Learning Program) as Compared to State and National Results.**

Period	School Year	Grade	Percentage of Students Scoring in the Following Classifications											
			Insufficient			Elementary			Well			Excellent		
			School	State	National	School	State	National	School	State	National	School	State	National
<b>Pre-Test: Prior to Metromatemáticas</b>	<b>2011</b>	<b>7</b>	67.3%	50.0%	59.3%	22.9%	31.7%	29.4%	9.2%	14.0%	9.3%	0.7%	4.4%	2.1%
<b>Year One Results</b>	<b>2012</b>	<b>8</b>	45.7%	45.5%	52.9%	30.7%	33.5%	32.4%	19.7%	14.0%	11.0%	3.9%	7.0%	3.8%
<b>Year Two Results</b>	<b>2013</b>	<b>9</b>	25.2%	36.0%	50.3%	22.8%	30.6%	22.0%	22.0%	18.2%	12.8%	30.1%	15.3%	6.8%

**Background:** The Metromatemáticas program represents a new model of teaching mathematics. It is designed to facilitate the development of technology skills, scientific instrumentation, and reasoning skills for students through an applied practice curriculum that employs current technology used in the STEM fields. The Metromatemáticas program was implemented in five schools in the State of Sonora Mexico in February 2012; consequently, participating students only had four months of services before the SY 2012 National math test was administered. The program operated throughout the 2013 school year.

**Source:** **ENLACE** (Evaluacion Nacional Del Logro Academico Centros Escolares) Results. **ENLACE** is the national examination administered by the Government of Mexico to assess student achievement in math, science and reading.

**Impact:** The National Test rates student performance according to one of four categories: Insufficient, Elementary, Well, and Excellent. Prior to participating in Metromatemáticas, math achievement for the students in the treatment group (150 students) was significantly less than the state and national averages as over 90% of the students scored at the Insufficient or Elementary levels. However, as shown in Table I and explained below, students who participated in the Metromatemáticas program improved their achievement in Mathematics both as they progressed through school and when compared to the state and national results.

1. The percentage of students **who excelled in math increased dramatically**. Based on the National examination administered in SY 2010-2011 (the pre-test), only .7% of the students in the treatment group scored at the Excellent level as compared to 4.4% of the students in the State and 2.1% at the national level. By 2013, or after one and a half years of participating in the Metromatemáticas program, the percentage of participating students who scored at the Excellent level increased to 30.1% as compared to 15.3% for the state and 6.8% nationally.
2. The percentage of students who scored at the **Insufficient level decreased significantly**. Sixty-67.3% of the students scored insufficient on the 2011 National Test which was 17.3 percentage points more than the State average and 8 percentage points more than the national average. After one and a half years of participating in the Metromatemáticas program, the percentage of students scoring Insufficient was reduced to 25.2%. The percent of students scoring at the Insufficient or Elementary levels decreased to 48% (as compared to 90.2% in SY 2011).

These results indicate a rate of improvement that was significantly better than the improvements reported at the state and national levels. In addition a greater percentage of the Metromatemáticas students scored at the Well or Excellent levels ( 52.1%) in SY 2013 as compared to the state (33.5%) or national (28.1%) results.

**Table II**  
**Additional Studies Conducted by Metromatemáticas in SY 2012 and 2013**

1. Based on treatment/control group study involving 279 students (132 students from experimental schools and 147 from control schools) and eighteen (18) teachers:
  - a. Students and teachers in the *Metromatemáticas* classrooms reported the new structure and operation of the **program strengthened learning and improved** the use of information technology and communication;
  - b. The *Metromatemáticas* laboratory was viewed as being more interactive.
2. In a study of 9<sup>th</sup> grade students (544 in the treatment group and 529 in the control group), after only 60 hours of math instruction utilizing the *Metromatemáticas* Lab, the **math performance of the treatment group increased significantly** as compared to the control group. Based on the pre-posttest comparison, the students in the control group who only had the classic math instruction recorded an 8.6 point loss; whereas math performance by participants in the 9th grade *Metromatemáticas* Laboratory increased 13.6249 Q.E.D.

Background: This study was commissioned by Metromatemáticas as a condition by the State of Sonora, Ministry of Education to obtain an independent evaluation of the program.

Source: MetCuatus Consultores ([http://www.metcuatus.org/Home\\_Page.html](http://www.metcuatus.org/Home_Page.html))

**Table III**  
**Metromatemáticas Job Training Program**  
**Fall 2013**

Number of Trainees	Average Pre-Test Score	1st Trimester Average Score	2nd Trimester Average Score	Post-Test Results
18*	19%	81%	81%	93%

In the fall 2013, local employers enrolled eighteen workers in the Metromatemáticas program for specialized job related training utilizing the Metromatemáticas curriculum and Lab. The average pre-test score was 19.4 with the highest score being 48. Forty percent (40%) of the trainees scored between 10% and 30% correct. At the time of the first interim test, the average score increased to 81%. This was maintained at the second testing. At the end of the course, the average score was 93%.

\* Nineteen workers participated in this project. However, pre and post test data was only available for 18 of the participants.

Prepared by the Santa Cruz County Superintendent's Office, Alfredo I. Velasquez, Superintendent. Information for this report was obtained from the Metromatemáticas program and local industry. It includes both program specific studies and results from the Mexican National Examination.