

Research Triangle High School

Research Triangle Park, North Carolina

Location type: Large suburb

School enrollment: 454 students

Percentage of students at school eligible for free and reduced price meals: 23

Key Findings in results

Though RTHS students scored among the top 20 countries in reading, math, and science, the results highlighted that the school's lower-performing students were struggling to develop the problem solving skills necessary to compete globally in math and science. The school also took actions directed at its higher-performing students after analyzing the student survey results that revealed that RTHS students hold a higher opinion of their ability than the test found to be true.

Actions Taken

After reviewing its performance data from the 2013-2014 OECD Test for Schools administration, RTHS chose to focus on three areas within its educational program as school leaders believed that these three areas would yield the most positive results:

- ✔ Developing a responsible "culture of error" in math and science problem solving and practice, which includes
 - Teachers use student mistakes to help tease out and illustrate mistaken thinking or reasoning. Students are frequently asked to discuss why they thought a wrong answer was correct.
 - Teachers practice asking all students to give examples of their own mistakes, failures, or incorrect thinking so that it is seen as widespread. The point is not to celebrate error but to show that it is common.
 - Students have multiple opportunities to try to solve a problem again rather than simply giving one halfhearted shot and then going to a teacher for the answer.
 - Formative assessments were retooled to not only check for correct answers but to also check the reasoning behind both correct and incorrect answers.
 - In some cases, teachers altered the way in which their classroom assessments were scored so that problem-solving methods were weighted more heavily than final answers.
- ✔ Using class time to emphasize engagement with knowledge rather than acquisition
 - Students absorb content knowledge primarily outside of class through teacher-made videos and playlists of web-accessible resources. This allows teachers to use class time for explorations, collaborative work, and for students to be able to practice problem solving with a teacher present.
- ✔ Increasing differentiation for students
 - The school uses the techniques of gifted instruction with lower-achieving students rather than relegating them to low-level drill and practice exercises. The school believes that building understanding builds confidence, which makes students better able to realize success and see themselves capable of overcoming novel challenges.
 - The school began a self-directed learning program in which students are presented with all content resources as a series of playlists (a library of materials). Students are allowed to progress at an appropriate pace and must pass a series of mastery tests to progress.
 - The school considers this to be a valuable tool to develop students' instrumental motivation because it allows students to self-identify what information is important and interesting to them and which techniques and skills are valuable to them.
 - For its lowest-performing math students (based on previous grades and test scores), the school

has scheduled a class that is tied to the Math I class (same teacher but the period before). This class is for 10 to 15 students only and allows students more time to work with a teacher should they need it. It also gives the teacher more time to understand the students' learning habits.

✓ To better develop their self-efficacy and instrumental motivation, RTHS students engage in a number of projects that help them to connect their classroom knowledge to real world application. Examples of such projects include:

- Students are required to film a 10- to 15-second video of a relationship in the real world with time as the independent variable. Students are required to identify the following: x and y intercepts in context, slope, and whether the relationship is a function, domain and range.
- Students are given a series of situations that involve finding solutions (maximizing profit, calculating cost/benefit, etc.) but for which there is more than one way to solve the problem. Students choose a way to solve the problem and then bring that solution to class on debate day. They then debate with their classmates over which method is the best way to solve the problem. The goal of this exercise is for students to understand the difference between solution sets and solutions and to be able to understand the appropriate situations in which to use each.
- Students compare and contrast a series of growth curves of different populations. The class then examines local growth data for the Triangle (Raleigh, Durham, Cary, and Chapel Hill) for the past 15 to 20 years and tries to identify patterns of growth. Students discuss potential limits to exponential growth of populations and make hypotheses about some conditions that might limit growth in certain areas or what may happen in places that are growing too quickly. The students are required to then choose an area of the world and look up data and draw conclusions and predictions about their chosen area.

✓ Research Triangle shared some of its practices as a presenter in one of the Global Learning Network's webinars on science. Before the presentation, faculty from the school attended a number of other GLN webinars (mostly those focused on math) as well as the 2014 Convening of World-Leading Schools.

RTHS' efforts appear to have paid off. The school's 2015 OECD Test for Schools results showed impressive improvement in math and science. RTHS improved its mean math and science score by 48 and 38 points, respectively. Furthermore, the number of students performing at levels 5 and 6 improved by almost 16 percent in math and 11 percent in science, while the percentage of students performing below Level 2 fell. As of 2015, RTHS has no students performing below Level 2 in science.

Those wishing to learn more about the practices at Research Triangle High School may visit the school's website [here](#).