



**Testimony of
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Before the
U.S. House of Representatives
Committee on Science, Space, Technology
Subcommittee on Research and Science Education

What Makes For Successful STEM Education?
Wednesday, October 12, 2011



Thank you, Chairman Hall, and the Members of the Committee, for the opportunity to testify on this critical topic facing our nation. I applaud the foresight of the Committee to commission the National Academy study on successful K-12 STEM models in our country – seeking to find what works.

I serve as the Campus Director of a 6-12 STEM school in the Denver School for Science and Technology (DSST) Public Schools network of charter schools. DSST Public Schools currently operates 5 STEM open-enrollment charter schools, three middle schools and two high schools, serving over 1,500 students in Denver, Colorado.

Because we are charter schools, all of our students enroll through a non-selective, random lottery. As a result, our student body is very diverse-- 50% of our students are low income and 70% are minorities. Our schools truly represent a cross section of Denver, the city we serve.

DSST Public Schools operates some of the most successful public schools in Colorado. Last year, DSST Public Schools operated the highest performing middle school and high school in Denver. We are most proud of measures that show growth—meaning, how much did a student learn from the first day of school to the last day of school. Within the state of Colorado, our schools showed some of the highest growth numbers of all public schools, according to the Colorado Growth Model on State CSAP tests. And at DSST: Stapleton High School, the school I lead, 100% of all four senior classes in the school’s history have earned acceptances to four year colleges. All of our students are prepared to study STEM fields of study in college and we estimate that 40% of our students are choosing STEM fields after graduation.

Most importantly, DSST proves, without a doubt, that all students, regardless of race or income, can earn a rigorous STEM high school diploma and attend four-year colleges and universities.

Preparing every student to succeed in a four-year college with the opportunity to study STEM is at the center of DSST’s academic program. Our STEM program is centered on three pillars.

First, our schools are built on the premise that all students deserve access to a high quality STEM education. A majority of DSST students enter well below grade level in the 6th and 9th grades and could never test into a magnet science program. Many students are conditioned to believe that science and advanced math “is an extra” and only for “smart kids”. In our schools, these subjects are not extras, but a core subject for all students. All students have access to STEM college preparatory curriculum.

Our second key belief is that schools must provide a rigorous STEM preparatory curriculum. We believe that the most important factor in a student choosing and ultimately completing a STEM degree is their preparedness to succeed at the college and graduate level.



Regardless of their starting point at DSST, all students are expected to pass 3 years of integrated science in middle school and more than 5 years in high school – and many students take more. Students take an algebra-based high school physics in the 9th grade. This provides students with a lab based class to practice, apply and synthesize the math skills they are learning elsewhere. All 9th grade students also take “Creative Engineering” where they learn the design process, how to conduct basic research, how to maximize and minimize constraints, and are hooked into engineering and the sciences as careers that improve the human condition. Students complete their high school requirements by taking a college level- physics class coupled with an engineering course or a college level biochemistry class coupled with a biotechnology class. Math is also a critical component of a rigorous STEM curriculum. All DSST students are required to pass at least pre-calculus to graduate.

Lastly, we believe the success of any school must be rooted in a strong school culture that focuses on building character and creating an accountable environment that expects all students to be college ready. Students are challenged, but supported in our schools. A peer-driven culture is reflected in each of our schools where going to college is cool and expected.

In sum, we agree with the recommendations for the National Academy’s *Report*. However, I would like to highlight four recommendations for further consideration by this committee:

- First, while we agree that there is a clear need to create more STEM Schools, we urge this committee to stress the creation of open-enrollment, access for all STEM schools. Only through these schools will we tap into the potential of all children in our country to create new labor markets for our STEM sector.
- Second, we must create rigorous STEM schools that go beyond “engaging” students in STEM to truly preparing them for STEM post-secondary study with rigorous math and science instruction. Getting students “excited” about STEM is important, but the larger problem lies in that most students lack open access to programs with the rigor needed to prepare them for college STEM degrees.
- Third, we must do more to simply create great schools built on high expectations and high accountability cultures. The emphasis needs to be on high quality models that focus on STEM instruction, not just more STEM Schools.
- Fourth, we need to attract more high quality candidates to teaching math and science. DSST Public Schools is a proud member of the 100Kin10 initiative to help recruit and retain 100,000 new math and science teachers over the next decade. This is a critical area of focus and effort.

On behalf of DSST Public Schools and Denver Public Schools, I thank you for the opportunity to share, and welcome further dialogue around the importance of creating high quality STEM education options for our country.