

Female Participation in the Progressive Science Initiative

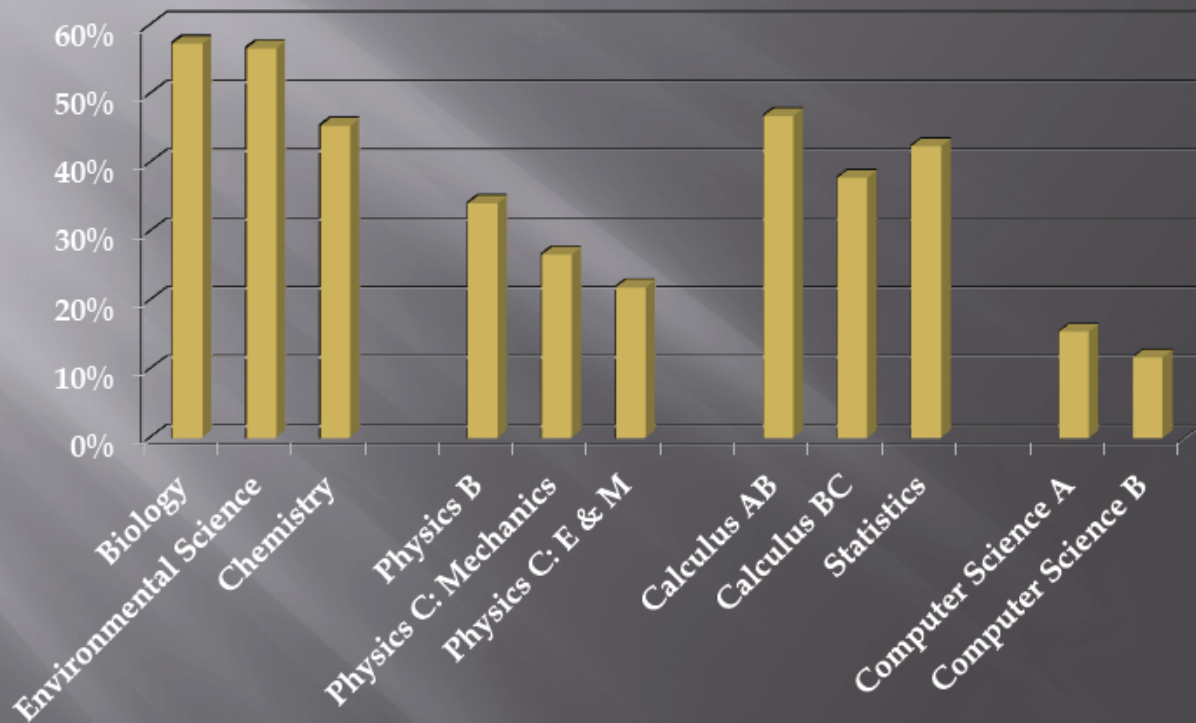
Dr. Robert Goodman, Executive Director, New Jersey Center for Teaching and Learning

The New Jersey Center for Teaching and Learning's programs grew out of an understanding of profound inequities in the delivery of science education in the US, exacerbated by antiquated sequencing of high school science courses. In particular, physics instruction was being offered infrequently, too late in the science sequence and absent mathematical rigor. CTL understands that in order to have a fair shot at the careers and critical thinking skills a sound science education offers, all high school students should study one year of mathematically rigorous physics and have the option of taking Advanced Placement Physics.

Recent participation rates for Advanced Placement Physics, a common measure of STEM attainment, demonstrate that schools employing the New Jersey Center for Teaching and Learning's science program, called the Progressive Science Initiative® (PSI®), have reversed the racial and economic achievement gap. In 2012, six of the top twelve New Jersey schools for Advanced Placement Physics B participation were schools that use PSI. The PSI schools served dramatically more students of color (83%) than the non-PSI schools (19%). The same is true of economic status, where PSI schools serve more low-income students (58%) than the non-PSI schools (4%).

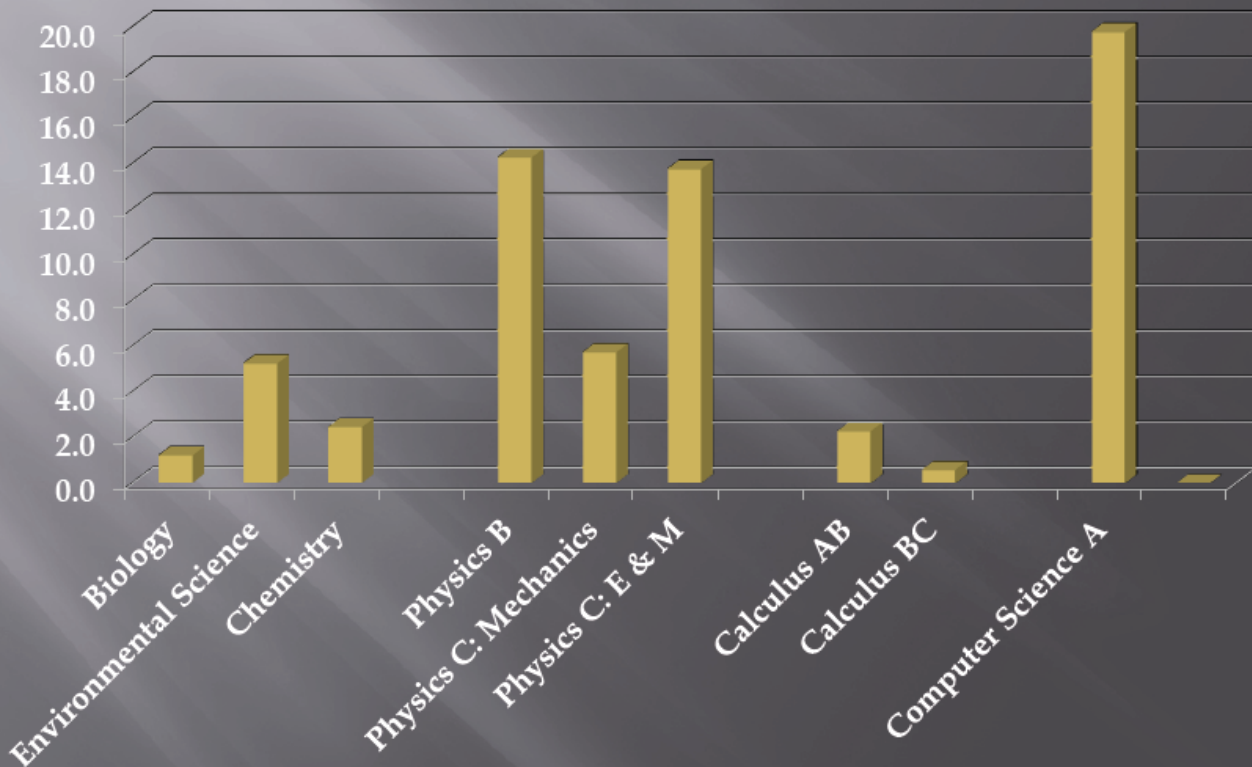
In 2007, when PSI was only two years old, the New Jersey Center for Teaching and Learning undertook an analysis of its impact on female students. This analysis looked at female participation rates in Advanced Placement Science examinations in New Jersey. As can be seen in the following chart, female students were slightly over-represented in biological and environmental sciences, mildly below parity in chemistry, significantly under parity in physics, and profoundly under-represented in computer science. The data source for the charts presented here is the New Jersey Department of Education.

FEMALE PERCENTAGE OF NJ AP EXAM PARTICIPATION IN 2007



With specific regard to gender, during the second year of implementation of PSI at Bergen Technical High School in Teterboro, New Jersey (2007, and the first year in which PSI students were eligible to enroll in Advanced Placement Physics), female students participated at 15 times the New Jersey state average rate. The strength of requiring a foundational year of mathematically rigorous physics during the freshman year clearly encourages young women in the sciences, just as it has shown to encourage impoverished students and students of color.

TETERBORO FEMALE PARTICIPATION RATES AS MULTIPLE OF NJ RATE – 2007



PSI students are judged based on only one thing: mastery. Students test, and if they wish, retest until they achieve a score that is satisfactory to them. PSI cares *what* students learn, rather than *when* they learn it. Other, more subjective measures such as classroom participation, behavior, and attitude have no place in assessing mastery. Knowing that mastery is the sole measure empowers those students, including females, who feel (often correctly) that such measures penalize them for factors beyond their control.

Deficits in STEM skills, so clearly and widely documented, can be reversed. Female students, students of color, and impoverished students can be provided with a pathway to STEM success. The New Jersey Center for Teaching and Learning has provided sure evidence that specific educational reforms can democratize science achievement for all students, including females. That is a goal that matters in the lives of our students and for the prosperity of nations.