

# Glassboro Public Schools

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March 17, 2016

Dr. Mark J. Silverstein, Superintendent  
Glassboro Public Schools  
[msilverstein@glassboroschools.us](mailto:msilverstein@glassboroschools.us)

Dear Dr. Shealey:

Because the Borough of Glassboro houses both the Glassboro Public School District and the main campus of Rowan University, our proximity has fostered a strong, decades-long partnership that has strengthened both institutions. Our most recent partnership, the Glassboro High School Science, Technology, Engineering & Math (STEM) Academy (established in 2013) enables high-achieving Glassboro Senior High School students to earn up to 16 college credits before their graduation from high school. With a different student base, the CS-ACTION Project is designed to expand access to CS and mathematics to those students who would not traditionally have this access. Thank you for including us in this proposal. We look forward to this work.

Best Wishes,

A handwritten signature in dark ink, appearing to be "MS", written over a long horizontal line.

Dr. Mark J. Silverstein  
Superintendent

## **CS-ACTION: Computer Science through Algebra and Computational Thinking Innovation and Opportunity Networks**

### **Project Summary**

CS-ACTION is an Exploratory Research proposal to investigate the efficacy of the integration of concepts and skills in computer science (CS) and college- and career-readiness (CCR) into a Common-Core aligned Algebra I curriculum at multiple low-income schools that serve populations of students who are underrepresented in computer science.

At the center of the CS-ACTION model is a sequence of innovative, integrated, and immersive curriculum units designed to provide students with opportunities to engage *concurrently* in learning concepts and skills in CS, mathematics and college- and career-readiness. Aligned to the *Common Core State Standards for Mathematics* (CCSSM), the *CSTA K-12 Computer Science Standards* (CSTA), and the *American School Counselor Association Mindsets & Behaviors* (ASCAMB), the units will be designed as replacement units for those typically taught in Algebra 1 courses.

Designed to be implemented by partnerships between and among schools and higher education (HE) institutions, the model includes multidimensional, embedded professional development (PD) for teachers and school counselors who will work with HE faculty to implement the curriculum units and facilitate informal after-school activities, challenges, and extensions. The implementation of these units requires an informed, supportive network of teachers, school counselors, and HE faculty who understand and have skills in these areas.

### **Intellectual Merit**

CS-ACTION proposes a solution to the problem of access to computer science courses and careers by integrating concepts, skills, and career-readiness in computer science into an already overfull high school mathematics curriculum. While both CCSSM and CSTA specify standards for CCR, few programs actively address them. The model includes significant PD and ongoing support for in-service teachers and counselors to ensure that they are well prepared to implement the units and informal activities. CS-ACTION builds on the PIs' experience developing and facilitating highly successful comprehensive and developmental summer programs to assist underrepresented students in gaining understandings skills that support their pursuit of STEM majors and careers. Additionally, the PIs have 40 years' combined experience delivering small- and large-scale PD to teachers and school counselors (both in-person and online), including (a) introductory concepts and skills in programming and computational thinking; (b) student-centered pedagogies within integrated STEM curricula; and (c) college- and career-readiness for first-generation and low-income students.

### **Broader Impacts**

The results of this work will establish a basis for further integration of foundational CS and CCR concepts and skills throughout the K-12 math curriculum, preparing students for more advanced study and increased enrollment in computer science classes. The project goals and activities are aligned to CCSSM, CSTA, and ASCAMB, ensuring that the modules produced will be appropriate for adoption by other schools throughout the nation. Curriculum units and PD modules developed for this project will be widely disseminated so that other K12-HE partnerships can enact them. The school districts selected to partner with this study were chosen specifically because they serve underrepresented populations of students. Multiple cohorts of students from each school will be studied, including cohorts of under-performing students who have been required to attend summer-school following failing grades in Algebra 1 during the school year. Successful outcomes for these varied cohorts of students would be strong evidence to other K12 schools that such HE partnerships could prove effective.