

Abstract

Assessing the Statewide Impact of K-12 Computer Science Pathways: Increasing Teacher Preparation and Expanding Student Computational Literacy

The Alabama State Department of Education (ALSDE) proposes an **Early Phase** project, *Pathways for Alabama Computer Science* (PACS), to address EIR **Absolute Priorities 1 and 3**, along with the **Competitive Preference Priority**. PACS will initiate a statewide high school pathway of computer science (CS) courses, primarily for high-need schools (defined as Title 1) in rural areas (defined by locale code). Project activities include an annual summer “CS Professional Development” week of experiences offered to: 1) 110 teachers who receive instruction from three different evidence-based curricula that form a CS course pathway; and 2) 60 counselors, as peers of the teacher cohort, who learn about the importance of CS career options and strategies for encouraging broader participation in CS among all students at their school. Additionally, six in-service centers located near the most rural areas of Alabama will support year-round teacher interaction through professional learning communities and classroom coaching with ALSDE-trained staff. Opportunities for student learning include: 1) an Algebra course that is integrated with CS topics (Bootstrap), taken by a majority of enrolled students in each school, and 2) two rigorous CS courses (Exploring Computer Science, ECS; and AP CS Principles, AP CSP) that were designed to engage students from diverse backgrounds. A subset of students enrolled in AP CSP courses will be invited to participate in supplementary learning experiences, including AP CSP Summer Institutes (a preparatory experience) and academic year study sessions offered on weekends at the regionally located in-service centers. Student-focused outcomes are CS course achievement, CS/STEM career interest, and retention in the available CS pathways, with pathway exit leading to existing workforce development opportunities. One randomized control trial and a longitudinal study will be conducted to determine efficacy. The primary goal of PACS is to establish equitable CS learning opportunities (from Bootstrap Algebra, ECS, and AP CSP) in primarily rural school districts with high enrollment of underrepresented students. An expected outcome is a demonstration of PACS as a model for equitable and sustainable expansion of CS across geographically dispersed rural school districts.

Grade Levels Served: 9-12

Total Participants Served: 240 Bootstrap Algebra teachers (45k students), 120 ECS teachers (9k students), and 80 AP CSP teachers (6k students); 240 school counselors

Other Partners: A+ College Ready (non-profit), University of Alabama (CS/Math Education), Tuskegee University (STEM equity), Haynie Research and Evaluation (evaluation), Mercedes-Benz (industry).