U.S. NATIONAL SCIENCE FOUNDATION (NSF)
COMPUTER SCIENCE EDUCATION RESEARCH CONGRESSIONAL REPORT
IN COMPLIANCE WITH PUBLIC LAW 114-329:
AMERICAN INNOVATION AND COMPETITIVENESS ACT, SEC. 310 (E)

Summary

The American Innovation and Competitiveness Act (ACA), 2017, Public Law 114-329, requires the U.S. National Science Foundation (NSF) to undertake specific activities regarding computer science education research. Specifically, in Sec. (310)(b), NSF is directed to award grants to "…eligible entities to research computer science education and computational thinking."

NSF's Computer Science for All (CSforAll) activities respond to this provision of PL 114-329. In 2018, NSF issued the first CSforAll solicitation, NSF 18-537, and in 2024, NSF issued an updated solicitation, NSF 24-555, with revised descriptions of four strands for proposals, three Research Practitioner Partnership (RPP) strands, and one Research strand. The Computer Science for All (CSforAll: Research and RPPs) program solicitation "…aims to provide (1) **high school teachers** with the preparation, professional development (PD) and ongoing support they need to teach rigorous computer science courses; (2) **preK-8 teachers** with the instructional materials and preparation they need to integrate CS and CT into their teaching; and (3) **schools and districts** with the resources needed to define and evaluate multi-grade pathways in CS and CT."

Metrics

The development of metrics to evaluate the success of the program is required by Public Law 114-329. This report focuses on short-term and mid-term metrics.

Report on the Success of the Program as Measured by the Short-Term Metrics
Short-term metrics focus on ensuring that the program is making awards in the four areas outlined in the law and that the awards address the goal of reaching the communities identified in the law while ensuring compliance with applicable Non-Discrimination Statutes and Regulations as detailed in the NSF Terms and Conditions. NSF considers 'short-term' metrics to be those that are observable on an annual basis.

During FY 2024, the program funded 13 new projects composed of 16 awards in 10 states to proposals submitted pursuant to NSF 24-555. These awards have goals that cover the first three research topics listed in Sec. 310 of the Act as outlined below. Because some awards have goals that span more than one of the research topics addressed in (b)(2) A (models of preservice preparation for teachers who will teach computer science and computational thinking), B (scalable and sustainable models of professional development and ongoing support for teachers), C (tools and models to support student success), and D (high quality learning opportunities), the number of projects sums to more than 13.

- 12 projects have research goals that address subsection (b)(2) A and (b)(2) B;
- 13 projects have research goals that address subsection (b)(2) C; and

- 13 projects have research goals that address subsection (b)(2) D

Taken as a group, these awards consider a range of opportunities to expand CS education and computational thinking. Examples of CSforAll supported efforts to address preservice preparations for teachers who will teach computer science and computational thinking, and/or professional development and ongoing support for teachers, can be found at the CSforAll: Research and RPPs program website.[1] These include methods for sustainable scaling using school and district networks, and regionally focused K-12 efforts. The geographic spread of these 13 CSforAll: Research and RPPs awarded projects is shown in the table below.

Geographic Regions Served by
FY24 CSforAll: Research and RPPs Projects

U.S. State/Region	Number of Projects Serving
Colorado	2
Florida	1
Hawaii	2
Illinois	1
Mississippi	1
National	2
Nevada	1
New Mexico	1
North Carolina	1
Oklahoma	1
South Carolina	1

Report on the Success of the Program as Measured by the Mid-Term Metrics
Mid-term metrics assess progress that individual projects can reasonably be expected to achieve within three years of award. Measurement of mid-term metrics is based on information contained in the projects' annual reports. Since we are reporting on FY 2024, mid-term metrics are given for the 32 projects comprised of 42 awards that NSF issued in FY 2021.

Based on the responses of the awardees, program staff assessed that 100 percent of projects awarded in FY 2021 have been making satisfactory progress for each year of the project duration. "Satisfactory progress" refers to criteria such as whether the stated goals of the project are being met; whether the major activities are in line with those planned in the original grant proposal; whether the opportunities for training and professional development are in line with those promised; and whether dissemination is occurring as planned.

---

[1] Computer Science for All (CSforAll: Research and RPPs) | NSF - National Science Foundation: www.nsf.gov/funding/opportunities/csforall-research-rpps-computer-science-all

Of the 32 FY 2021 awarded projects, 6 projects were funded through the research strand and focused on building strategically instrumental, or "high leverage" knowledge about the learning and teaching of introductory computer science to support key CS and CT understandings and abilities for all students. These projects reported a total of 36 publications in the form of journal articles, juried conference papers, and other conference presentations/papers. The remaining projects voluntarily included information about number of educators reached – the 26 CSforAll RPP awarded projects from FY 2021 reported a total of approximately 706 educators reached.

<u>Report on the Success of the Program as Measured by the Longer-Term Metrics</u>
In FY 2023, NSF identified a contractor to carry out the "Evaluation of CSforAll RPPs Long-term Outcomes", which focuses on longer-term (5 years or more) outputs and outcomes associated with the 73 Researcher Practitioner Partnerships (RPPs) funded under NSF's CSforAll RPPs initiative in FY 2017, FY 2018, and FY 2019. In FY 2024, NSF program staff worked with contractors to identify potential metrics for documenting longer-term outcomes of CSforAll: Research and RPPs projects. In FY 2025, the program expects to select metrics that will be used to assess the collective success of the first five years of CSforAll: Research and RPPs projects.