Collaboration as a Tool to Engage Underrepresented Youth in Computer Science

There is an increasing need in the United States to diversify the computer science (CS) workforce, both to meet the growing demands of the field and to better represent our nation’s population. The Computer Science Collaboration Project (CSCP) proven national model uses collaboration to enable professionals to provide high-quality CS opportunities to youth underrepresented in CS. In particular, CSCP focuses on engaging Hispanic/Latino(a) youth and youth with disabilities in CS. This model includes strategic activities, including an online database, in-person events, and mini-grant funding, that encourage individuals and organizations to work together to leverage existing resources and expertise in both CS and engaging underrepresented youth to help bring CS to underrepresented youth. The CSCP also focuses on building the capacity of K-12 practitioners to engage underrepresented youth in CS by supporting the use of exemplary practices.

Collaboration is a key strategy for leveraging resources and strengthening the capacity of professionals to provide high-quality CS opportunities to youth underrepresented in CS. Collaboration is an interactive process intended to enable professionals across projects and communities that share goals to generate and carry out creative solutions and strategies that maximize benefit beyond that which one project or community could accomplish. It is critical to leverage key resources, such as CS expertise and experience working with underrepresented youth, to provide these high-quality CS opportunities and to avoid reinventing the wheel or expending unnecessary (and often unavailable) funds.

Sixty-eight percent of respondents to the CSCP Annual Survey administered to CSCP participants indicated CSCP increased their knowledge of activities, programs, and efforts in CS. Annual Survey respondents also reported being very interested in collaborating with others, most commonly connecting with people from community-based organizations/not-for-profits and K-12 formal education. The highest levels of collaboration of Annual Survey respondents were with higher education representatives and K-12 formal educators. Fifty-three percent of Annual Survey respondents indicated CSCP had slightly, moderately, or greatly increased their levels of collaboration and all agreed that the increased collaboration made their work more efficient, more effective, and reduced feelings of organizational isolation.

This session will explore current research on collaboration, present a compilation of best practices in collaboration based on research and practice, and discuss the importance of collaboration in engaging underrepresented youth in CS. Presenters will highlight CSCP mini-grants, an effective strategy to incentivize and sustain collaboration. The CSCP offered mini-grant funding to efficiently increase the participation of K-12 youth with disabilities and Hispanic/Latino(a) youth in CS. The mini-grants were designed to build collaboration between professionals from K-12 settings, community-based organizations, higher education, and industry to encourage underrepresented youth to explore and/or pursue CS educational programs and careers.

Thirteen mini-grant projects were funded, nine that served youth with disabilities and four that served Hispanic/Latino(a) youth, serving over 400 youth. All mini-grant projects rated their collaborative relationships and efforts to engage underrepresented youth as successful. They also reported they will continue to work with their partners on programs
and activities after their mini-grant funding ends. Respondents viewed the overall impact of the project on the project participants to be an increased awareness of CS and careers in that field, increased confidence to do CS, and increased leadership or job readiness skills, an increased understanding of the nature of CS and its educational and career opportunities and the resources to help them in these fields, increased interest in pursuing CS, exposure to CS principles, and pride in their achievements in the project. One respondent wrote, “We would not have been able to complete any of these projects without our partners. We do not have the resources or expertise to provide our students with enough information or events regarding computer science. Our partners provided the locations, the information, the expertise, and the activities for our students.”

One CSCP mini-grant recipient, Lynn Reha, Director of the Illinois Center for Specialized Professional Support, will present on her mini-grant project: SMARTer Board: Girls Resolve Accessibilities Issues, a collaboration between the Illinois Center for Specialized Professional Support and Metcalf School, a local middle school. This project utilized a Design process with four Design Teams which each met three times. Each Design Team created solutions to the stated problem of the inherent lack of accessibility to interactive whiteboard technology experienced by students with visual impairments. By grouping middle school girls, pre-service teachers, teachers, and students with low vision and blindness together to solve this problem, the students with low vision and blindness became the experts. Not only did the students with low vision have insight into the problem, but they also needed to test the ideas. As a result of involving diverse students on the same teams, sighted Design Team members learned more about the experience of the students with a disability and were inspired to help find good solutions.

Participants in this workshop will learn about the CSCP collaboration model and how to use available tools and resources to strengthen efforts to engage underrepresented youth in CS and learn how to create, sustain, and leverage partnerships to increase organizational capacity to provide CS opportunities to underrepresented youth. Participants will share their own successes and challenges in forming collaborations, participate in an interactive collaborative exercise, and will have the opportunity to plan concrete action steps they can take to form new collaborations and increase their capacity to serve youth underrepresented in CS.

Handouts that will be provided include:

- **Best Practices in Collaboration.** A document that outlines twelve research-based strategies for effective collaboration (with references).
- **Collaboration Action Plan.** A guiding document that assists professionals in developing a multi-step plan for a collaborative project to engage underrepresented youth in computer science.