



Computing4Change

SC18 Computing4Change Executive Summary Report

March 2019

Advanced Computing for Social Change Institute

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**Advanced Computing for Social Change Institute
SC18 COMPUTING4CHANGE
EVALUATION REPORT**

EXECUTIVE SUMMARY

The SC18 Computing4Change Competition (C4C) was a 5-day long student engagement experience co-located at the SC18 conference from November 11–15, 2018. C4C’s roots can be traced to the XSEDE16 conference student program where over half of the 98 participating students came from underrepresented groups in computing including women (37%) and racial and ethnic minorities (50%). Building on the XSEDE16 student program’s reported success of recruiting and engaging diverse students in advanced computing, organizers developed the broader Advanced Computing for Social Change Institute (ACSCI) with the intention of creating similar opportunities for underrepresented students. A subsequent SC16 challenge served as a pilot for extending this experience and was funded in part by SC and the eXtreme Science and Engineering Discovery Environment (XSEDE). This year’s program at SC18 was supported in part by XSEDE as well as the Advanced Computing Machinery’s (ACM) Special Interest Group on High Performance Computing (SIGHPC). Objectives of the program include; 1) engaging students in a socially relevant challenge utilizing advanced computing techniques, 2) increasing the participation of students historically underrepresented in STEM at SC conferences, and 3) creating a cohort of students to serve as future ambassadors at SC conferences. The SC18 challenge was designed to teach computation, data analysis, and visualization techniques in order to take a data centric view of the rhetoric surrounding violence in the United States of America. The evaluation of this challenge was conducted to provide valid and useful information to program organizers and funders in order to guide program improvement and facilitate sustainability.

Evaluation Methods

A mixed-method evaluative design was employed. Multiple data collection methods and sources were employed to obtain information. Data sources included informal observations, surveys, and focus groups.

Key Evaluation Findings

- **Staff Preparation:** The staff planning retreat was beneficial for fostering relationships between first-time mentors and staff. Due to the new competition format, mentors were challenged by increased conflict resolution responsibilities and would like additional preparation prior to future events.
- **Webinars:** While pre-event webinars were rated positively by students prior to the competition, following the experience participants believe the sessions should align more with main competition tasks. Suggestions include addressing each of the main competition areas through practice drills from finding data to visualization.
- **Inclusion:** C4C demonstrated inclusion by seamlessly accommodating participants needing special arrangements. While unexpected, not all, were ultimately able to meet the physical demands of the competition.

- **Student Interests:** Students primarily applied to the program due to the “change” component and felt the event’s cultural focus fostered a deeper connection with the program. While connecting to student experience motivated some participants, others were unsettled and felt pressured to reveal delicate information about their personal lives as it related to the topic of violence.
- **Time Management:** Excessive time spent in group topic exploration and mock presentation sessions with committee members disrupted the overall program and left some students disadvantaged. Participants suggested pre-event homework, parallel sessions, and adjusted submission deadlines to improve time management and allow for more conference participation.
- **Computational Skills:** Students reported practice in data analytics, visualization, team work, and presentation skills as program benefits. Expectations to improve computational skills, however, were not met. Suggestions to increase technical work include incorporating machine learning tools and requiring original visualizations in final presentations. Respondents also suggest sharing sample projects from previous years to normalize expectations.
- **Collaboration:** According to mentors, the program’s shift from “challenge” to “competition” reduced collaboration between teams present in previous years. Mentors suggest rotating assignments to increase inter-team communication.
- **Incentives:** Participants were not considerably motivated by a monetary prize to do well in the competition. Suggestions for more appealing rewards were primarily experiential-based.
- **Public Platform:** Providing a public platform for students to share their experiences was a welcome change to the program this year. Recommendations for improving the format and increasing attendance through additional advertising were made.
- **Accommodations:** Students and mentors found the lodging to be adequate but would prefer to be in the same hotel to simplify logistics and allow more time for informal group interaction.

Recommendations

- **Staff Preparation:** Continue to conduct an annual staff planning retreat for program coordinators and mentors. Maximize time during the retreat by assigning questions for reflection and discussion prior to the meeting. Prepare mentors for the competition through training on team dynamics with an emphasis on conflict resolution. Consider inviting guest speakers to discuss their experience with managing similar student programs and group interactions.
- **Webinars:** Improve the utility of webinars by aligning topics with competition components namely finding, cleaning, analyzing, and visualizing data. Have students progressively practice each component in preparation for the event. Consider creating a Piazza course to allow students to post forum questions and synchronously interact with mentors in their time zone to reduce scheduling conflict issues.

- **Accommodations:** When possible, book all mentors and students in the same hotel to simplify logistics and foster community building. Provide daily informal meals such as pizza dinners in the hotel to encourage interaction between teams.
- **Inclusion:** Consider including additional screening questions or certifications on the program application form to ensure that students are able to physically compete in the event. Provide details about the physical demands of the event including primarily sitting in one room for long hours so that students are better able to assess their ability.
- **Student Interests:** Continue to appeal to student interests by focusing on a “change” component and incorporating culture. Develop and disseminate a reflection worksheet to students when the topic is revealed to reduce time in sessions and set expectations. Remind students that the worksheet is for private reflection and they are not required to share personal information about their connection to the topic. Consider reframing topics to focus more on ways to support positive outcomes instead of negative issues i.e. safety vs violence.
- **Time Management:** Improve time management during group committee meetings by assigning reflection worksheets and conducting parallel consultations. Ensure groups have equal time to compete by adjusting submission deadlines to compensate for time spent in committee member meetings. When possible, schedule group consultations parallel to technical, student, or early career program conference activities so that students without an approved topic assignment can attend the conference.
- **Computational Skills:** Increase the amount of computational work by requiring original data visualizations in final work products and utilizing tools to simplify competition components like machine learning for data cleaning. Consider narrowing the scope by providing data sets in advance to allow more time for computational tasks. Provide participants with sample work products from previous program years to normalize expectations.
- **Collaboration:** Explore ways to increase collaboration between staff and teams in a competition setting. Allow mentors to present on their work or past competition experience in lightning talks to improve understanding of their expertise among student participants. Encourage “mentor mixing” by rotating mentors during set time intervals to increase communication between individual mentors and multiple teams.
- **Incentives:** Offer prizes at various levels, i.e. 1st, 2nd, 3rd, etc. When possible, expand rewards to include experiential prizes such as internships or presentations at subsequent events. List awards in application materials.
- **Public Platform:** Increase attendance at the final presentation session by including it in the SC schedule, distributing flyers at partner booths, and social media promotion. Improve the session format by clearly delineating between public and internal segments. The public session should include a brief introduction of the program, student presentations, and audience questions followed by an intermission prior to transitioning into the internal session where more specific program details and reflections may be discussed with key program stakeholders.

