PINC – Promoting Inclusivity in Computing

PINC Funded by NSF Promotes Diversity, Inclusivity, and Data & Computational Science Literacy among Science Majors.

PINC – A Novel Computing Applications Minor.  PINC (Promoting Inclusivity in Computing) is an innovative 15 unit program funded by a $1.3 million grant from the National Science Foundation to develop and implement a Computing Applications Minor that promotes an inclusive learning environment to build the diverse, multidisciplinary Computational Science workforce of the future. It addresses two pressing needs:

1) Increasing the number of students who are data & computer science–savvy.
2) Increasing diversity in data & computational science to advance workforce diversification.

Uniqueness of PINC.  PINC is a creative, sustainable and scalable model for introducing data & computational science to science and non–science majors, including economics majors. Students with a full course load in their majors can earn the Minor, since it does not require prior data/computational science knowledge. It can be implemented at institutions nation-wide interested in broadening participation in data/computational science. PINC fosters a safe learning environment by providing students one-on-one mentoring, research rotations in their fields of interests, and a supportive network of faculty and students from diverse backgrounds.

PINC Removes Barriers Learning Data & Computational Science.  Recognizing the importance of data & computational science in all aspects of life, devoted faculty members in the College of Science & Engineering (CoSE) led by the CoSE Dean and professors in the Departments of Computer Science, Biology, Chemistry & Biochemistry, and Psychology, are implementing the Minor to lower the barriers for interested students to acquire foundational knowledge in data & computational science applications. PINC uses evidence-based approaches to attract, retain, and support students, especially those from under-represented groups and female students. Through activities tailored to their majors, students remain engaged and experience how data & computational science are applied in their majors and future professions.

PINC Promotes Strong Ties with Other Programs and the Community.  PINC ties in with other NSF-funded initiative to increase the diversity of students with computing expertise and provide them the competencies to pursue advanced degrees and careers in computational & data science [INCLUDES – Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science ($300 K); CS4ALL –
Computer Science for All ($390 K); CAHSI (NSF INCLUDES Alliance: Computing Alliance of Hispanic Serving Institutes ($3.67 M]. Through these programs, students in PINC reach out to the community by working with K–12 students as computer science mentors and role models fostering critical skills and leadership development, and local industry government agencies.

**PINC Uses Inclusive Pedagogies.** PINC provides students learning experiences in computational & data science, which are relevant to their majors inviting them to share their knowledge with the K-12 community. It trains participating faculty members in evidence-based science teaching methods and fosters a nurturing and supportive community of learners through the use of pedagogies that: (i) reduce stereotype threat and imposter syndrome by employing a cohort-based structure featuring peer, faculty, and industry mentors; and (ii) promote students’ interest and motivation to apply computer & data science in their majors.

**PINC’S SUCCESS.**
In its first three semester offerings, PINC increased computational science diversity. Over 70% of PINC students identified as female compared to 19% of Computer Science majors (≥ 3-fold increase; 290% increase. The percentage of African American and Hispanic students in PINC is 93% higher than in the computer science major (51% vs 26%).

**Students Embrace PINC.** PINC’s success is reflected in students’ quotes:

*As a young female minority scientist, PINC gave me an unforgettable opportunity to meet some amazing women in science and engineering… This was the first time I had been in a room with hundreds of women of all colors. It was empowering!!*

*This semester I learned about web page development and this was the first time I didn’t shy away from clicking on the View Page Source icon. Seeing the html and Javascript code for that webpage was simply amazing to me. It didn’t look foreign anymore!*

*Today I am humbled by what PINC has taught me and can envision the bountiful opportunities that await the future PINC students at SFSU.*

*I quickly realized coding truly was an alien language, based on an alien alphabet, using alien logic. Luckily, with the support of the PINC mentors, dedicated faculty and staff and lots, and lots, and lots of practice, I am so much more comfortable looking at coding, understanding what the code is supposed to do, finding online resources, and even writing my own programs than I ever thought possible. I’ve taken many difficult courses over my lifetime, but learning CS has been the most difficult academic challenge I’ve ever encountered.*