

Supporting Students from Underrepresented Groups to Succeed in Computing: Research and Programs in Community College

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ABSTRACT

There are over 1,000 community colleges (CC) in the U.S.; they enroll more than 13 million students--nearly half of all undergraduates-- and over half of CC students are non-white (American Association of Community Colleges). However, efforts to broaden participation in computing have been directed disproportionately to 4-year institutions. The focus of this panel is on research and strategies for increasing the retention of students from groups that are underrepresented in computing--female, Latinx, and African American students. It includes experts from across the US--from CC's and a research organization. The panelists will describe curriculum and programs that are designed to support students, and include the perspectives of students on what helps and hinders them from persisting. The intended audience for this panel is researchers, educators, and administrators from both community colleges and 4-year institutions.

Categories and Subject Descriptors

• Social and professional topics → Professional topics → Computing Education → Adult education

Keywords

broadening participation, community college, transfer pathways, STEM

1. SUMMARY

Individuals from underrepresented groups obtain technical training in disproportionate numbers at community colleges (CCs). For example, in the U.S., Information and Communications Technologies (ICT) courses at CCs enroll Latinx (28%) and female (48%) students, but these groups represent only 5% and 21%, respectively, of the ICT workforce [1, 2, 3]. However, most research on strategies to recruit and retain students from underrepresented groups focuses on 4-year universities and

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colleges. As the strive for equity in computing education continues, it is essential to focus on all types of higher education settings. The goal of this panel is to describe lessons learned about how to support students from CCs to stay in computing intensive fields. This includes innovative curriculum and programs, as well as research that highlights the perspectives of students from underrepresented groups on the supports and challenges to persisting.

2. PANEL STRUCTURE

For this 75-minute panel, after a brief introduction, each panelist will present for 15 minutes on their respective programs and research. The presentation will be followed by the moderator facilitating an audience discussion for the remaining 30 minutes. We anticipate questions about how to best support CC students in computing in and out of the classroom.

3. AMARDEEP KAHLON

Amardeep Kahlon is the Director of the Women in IT (WIT) program at Austin Community College as well as the Assistant Dean for Distance Learning and External Relations. She has taught in the Computer Science and Information Technology field for 28 years. In her current role, her focus is on providing support to the students in the WIT program. With this program, the college has nearly doubled the number of female graduates in Computer Science and Information Technology. Further, using innovative pedagogies and delivery techniques along with wrap-around support for students, the college has seen impressive gains in the success rates of other underrepresented populations to include African Americans and Hispanics. Amardeep will report on the interventions and programs put in place for underrepresented students as well as the data showcasing the positive results of these efforts.

4. CHERYL CALHOUN

Cheryl Calhoun is the Dean of Access & Inclusion for Santa Fe College where she has taught IT for over 20 years. Dr. Calhoun will share preliminary results from her role as PI on the NSF Advanced Technical Education funded Guitars, Rocketry, Robotics Advanced Technical Education (GRRATE) project. Through innovative project-based learning, GRRATE is designed to help students gain the competencies and self-efficacy needed to succeed in STEM fields. This project introduces students who are often underrepresented in STEM (e.g., students of color, low-socioeconomic, rural, female students) to the possibility of high-paying, rewarding careers in STEM. GRRATE will accomplish this

by creating a single ISC1006 Wide World of Science course that will be offered at Santa Fe College's three rural education centers. This interdisciplinary course will use culturally responsive pedagogy and project-based learning to expose students to scientific method, research and analysis, technology, engineering, and math. Dr. Calhoun will share their experience in creating this innovative curriculum including the use of a S-STEM survey [4, 5] as a pre-/post- measure of students' attitudes as a result of participation in the course.

5. SHANNON CAMPE

Shannon Campe has spent the last 15 years focused on how to broaden participation by studying how underrepresented students pursue and persist in computing. Her current project is a longitudinal study of over 600 students in ICT classes from 17 community colleges in California. Shannon will report on results from this study, including interviews from a subset of 33 students underrepresented in computing. The interviews provide in-depth, contextualized information about the individual, relational, and institutional factors that support or challenge students' persistence in computing classes. Preliminary findings suggest that students perceive that there are a range of individual factors (e.g., motivation, work-school-life balance, age) and relational factors (e.g., romantic partner, family, instructors) that support or present challenges for their educational and vocational pursuits. In addition, the students reported a range of institutional factors (e.g., class structure, class offerings, degree of guidance about which classes to take) that have acted as a support or barrier. The presentation will highlight how relationships with CC instructors, other CC staff, family, friends and employers can play an active part in supporting the non-academic as well as research-based suggestions for addressing the academic needs of students as they manage the conflicting demands of home, work and school.

6. DEBRA RICHARDSON

Dr. Richardson is Professor Emerita of Informatics and founding dean of the University of California–Irvine's Donald Bren School of Information and Computer Sciences and is leading a collective impact network on community college pathways that is part of the Expanding Computing Education Pathways (ECEP) Alliance. She will serve as the Moderator for this panel, help to connect the presentations to the conference theme of laying the groundwork for the next 50 years of computing education, and lead audience participation.

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