

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

BOARD ON SCIENCE EDUCATION

BOARD ON HIGHER EDUCATION AND WORKFORCE

The Impacts on STEM Undergraduate and Graduate Student Experiences of Higher Education's response to COVID-19: Resilience and Innovation in Socialization and Student Engagement

We will begin at 1:00 pm ET

Sponsor: National Science Foundation

October 1, 2020

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The Impacts on STEM Student Experiences of Higher Education's response to COVID-19

Planning Committee:

Tasha Inniss, Spelman College, Chair

Alfred Bryant, Campbell University

Jim Julius, MiraCosta College

Hironai Okahana, Council of Graduate Schools

Juan Ramírez-Lugo, University of Puerto Rico, Rio
Pedras

Viji Sathy, University of North Carolina, Chapel Hill

Heather Thiry, University of Colorado, Boulder

NASEM Staff:

Kerry Brenner, BOSE

Maria Lund Dahlberg,
BHEW

Matthew Lammers, BOSE

Co-curricular Support Systems

Panelists:

Sarah Bergfeld, Western eTutoring Consortium

Wilson Lozano, Inter American University of Puerto Rico –
Bayamon Campus

Adrean Askerneese, MiraCosta College

Melissa McDaniels, University of Wisconsin, Madison

Lev Gonick, Arizona State University

Moderator: Jim Julius, MiraCosta College



**COMMUNITY AND
TECHNICAL COLLEGES**
Washington State Board



Sarah Bergfeld, PhD
Director, eTutoringOnline.org
sbergfeld@sbctc.edu

CoRE - An effort to engage College Hispanic Students in STEM

- Established a PLTL Program with the support of CAHSI
 - 10 sessions (2019-2020)
 - 8 PLTL Leaders
- The COVID 19 and the transition to virtual environments



CoRE - An effort to engage College Hispanic Students in STEM

- Extracurricular activities
- Non traditional research space
- Academic activities
- Leadership
- Peer mentoring
- Students self confidence
- Counseling
- Scouting
- Coworking space
- One size does not fit all





Roles: <https://bit.ly/3hRsEzw>



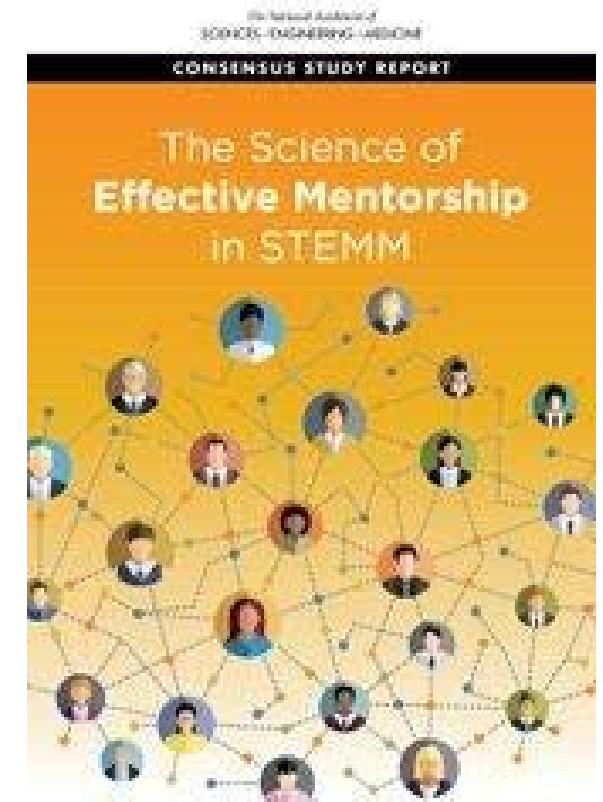
**Support for Multiple
ACP Teams**

Data Coach/Research Analyst
Care Team
Financial Aid Specialist
Technology Specialist
Professional Learning
Advisory (Special Programs)

Mentorship Education

one co-curricular structure supporting
inclusive practices in mentorship
during COVID & beyond

Melissa McDaniels, Ph.D.
Associate Executive Director, CIMER



Structured Mentorship Education Programs Exist to Train both Mentors and Mentees

Train Mentor



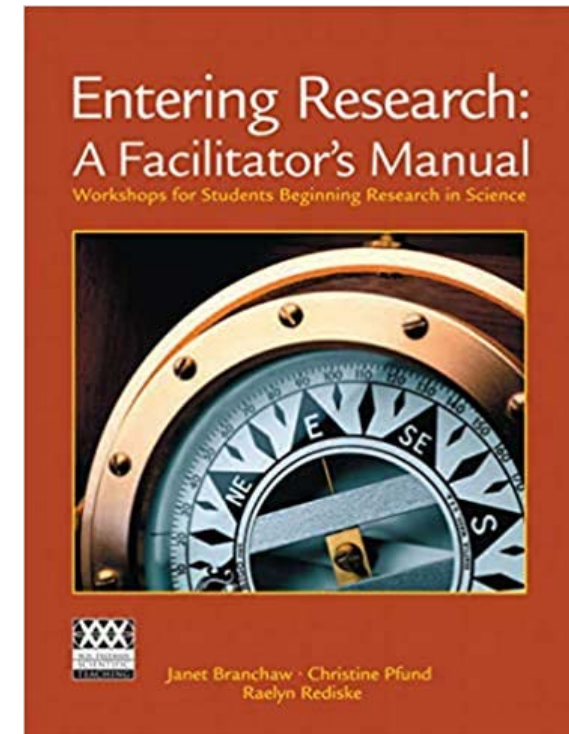
Faculty

Postdocs

Graduate
Students

Undergrads

Train Mentees



Evidence- & Competency-Based Approaches

- Aligning Expectations
- Assessing Understanding
- Maintaining Effective Communication
- Addressing Equity & Inclusion
- Foster Independence
- Promote Professional Development

** relevant regardless of context **



**Co-curricular activity being run nationwide by scientists (e.g., training grants),
graduate schools & faculty development centers.**

We needed to attend to two audiences in our *mentorship education ecosystem*:

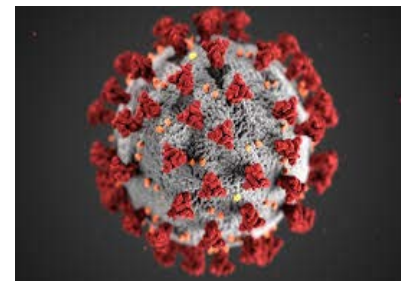
Mentors & Mentees – 3-Step Collaborative Process

- **Reassess** – Ask research mentees & mentors to reflect on the attributes of the in-person mentoring relationship (think competencies).
- **Realign** – Use their answers as the basis for a discussion in which shared goals are articulated and a commitment is made to maintain aspects of the relationship that are going well and improve those that are not.
- **Reimagine** – Develop a mutually agreed upon plan to achieve the goals remotely. Schedule regular check in meetings to revisit the plan and make changes if necessary. Plans that are successful may persist beyond the current crisis.

Trained Facilitators – Implementation Training

- **Experience Entering Mentoring** – Experience a component of a familiar training curriculum in an interactive online format.
- **Prepare to Facilitate an Activity** – Consider what module to implement, what online functions this will require, what preparation will I need, what concerns do I have?
- **Planning to Implement Online** - Consider audience, format, technology, content, outreach

Pfund, Branchaw, McDaniels, Byars-Winston, Lee and Birren. (submitted)
Reassess-Realign-Reimagine: A Guide for Mentors Pivoting to Remote Research Mentoring (<https://osf.io/preprints/socarxiv/efgh8/>)



Wrap-Up

- Mentorship education is an important co-curricular activity being delivered on campuses and at disciplinary society meetings nationally. When implemented effectively, it is an important tool to promote inclusive mentoring relationships.
- In the “COVID-pivot”, we needed to attend to both the recipients of our co-curricular education programs (mentors & mentees) as well as our leaders of these co-curricular programs.
- As we move into the “next normal” it would behoove us to:
 - Consider how to promote, on a continuous basis, the “Re-Assess”, “Re-Align” & “Re-Imagine” model of collaborative reflection on our mentoring relationships.
 - Study (and we are) the efficacy of online vs. face-to-face delivery of mentorship education.

Lev Gonick, Arizona State University

Extra-curricular Support Systems

Panelists:

Enrico Pontelli, New Mexico State University

Shereada Harrell, Florida A&M University

Adriana Salerno, Bates College

Luis Dominguez, Jr, University of Houston, Downtown

Moderator: Tasha R. Inniss, Spelman College

New Mexico State University Virtual Summer Camps

POTENTIAL AND CHALLENGES

Enrico Pontelli

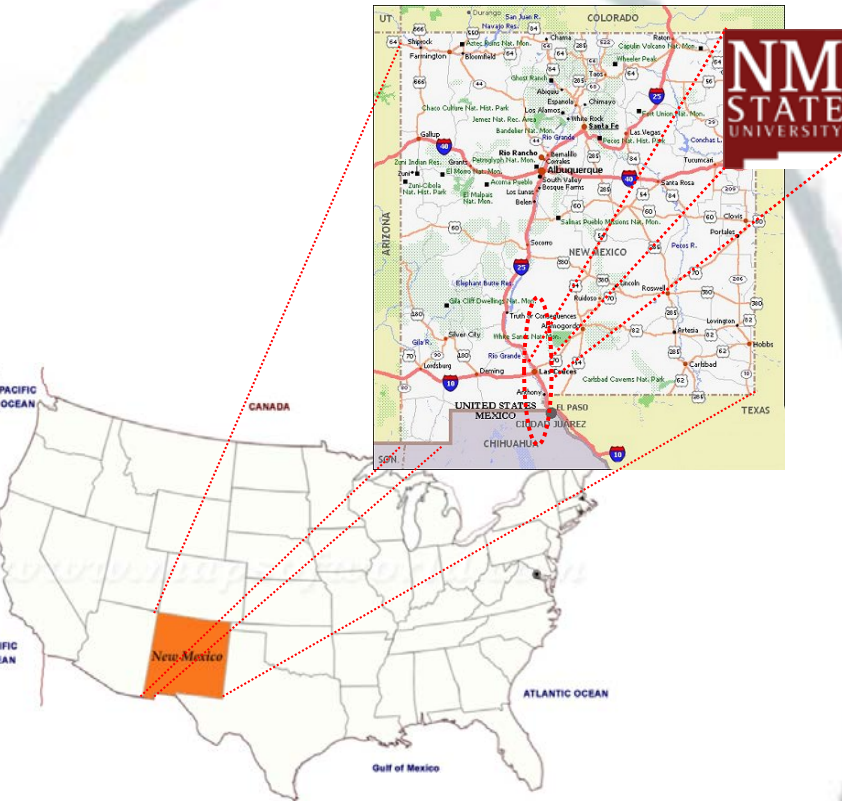
College of Arts & Sciences

Computer Science



BE BOLD. Shape the Future.

Context



- **New Mexico State University**
 - HSI land-grant and space-grant
 - NMSU CS: 62% Hispanic, 2% Native American, 2% African American
- **Young Women in Computing (since 2006) and CS Adventures (Co-ed, since 2015)**
 - Comprehensive year-around informal learning program
 - Middle and High School Summer camps, led by UGs
 - Problem-oriented CS learning
 - Building social capital, leadership, professional skills
- **Virtual 2020 – the “new-now”**
- **3 virtual camps**
 - Middle School Young Women camp (27 participants, 56% Hispanic, 30% White, 7% Native American)
 - High School Young Women camp (20 participants, 55% Hispanic, 10% Asian, 30% White)
 - High School CS Adventures camp (31 participants, 58% Female, 58% Hispanic, 16% Asian, 16% White, 3% Native American)
 - Project-based, emphasis on CS and Cyber-physical systems
- **Combination of**
 - Synchronous Lectures (delivered by CS students)
 - Teamwork (Zoom breakout rooms)
 - Social and professional activities, e.g.,
 - Zoom meetings with professionals and faculty
 - Team games and social events (e.g., Netflix Party App, Crazy Hair day)
 - End-of-day reflections



The Good and the Challenges

- **Good**

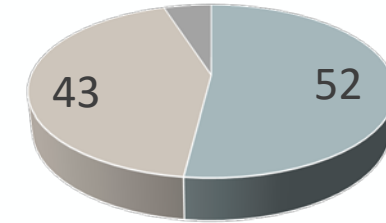
- More applications than usual
- Ability to reach geographically diverse communities
- Outstanding feedback from participants
 - Levels of interest in CS and comfort in CS concepts higher than face-to-face camps
 - Compared to other virtual experiences – highly satisfied, more interaction, more fun
 - Better opportunities for introvert students (“It felt less awkward than face-to-face”)
 - Camp was “funnier” than face-to-face and online regular classes

- **Challenges**

- Lots of extra work – e.g., mailing kits to dozens of students
- Technological challenges (e.g., internet access, install software)
- Assumptions about access to technology need to be validated ahead of time
- Some concerns raised by participants
 - Afraid of asking for help (“I did not want to bother others”)
 - Miss the interaction with other students (“I miss being in the room with people”)
- Some concerns raised by instructors
 - Participants can turn-off their cameras; Difficulty in assessing level of attention
 - Instability of internet connection
 - Challenges to provide individual assistance
 - Break-out rooms to provide assistance are effective but separate the students from the rest of the class

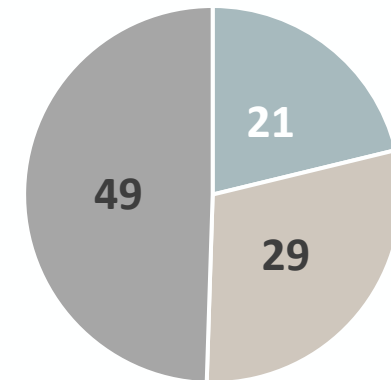
I Learned how to use CS to Solve Problems
Virtually

50



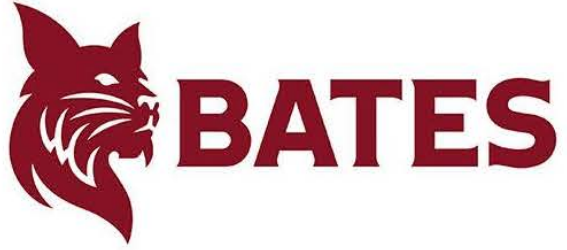
■ Strongly Agree ■ Agree ■ Neutral ■ Disagree

Compared to F2F Camps?



■ Same ■ Virtual is Better ■ Face-to-face is Better

Shereada Harrell, Florida A&M University

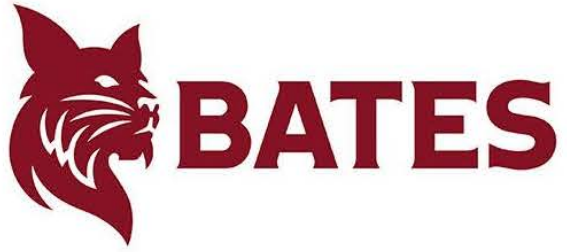


Adriana Salerno -- Mathematics.

About me:

- Chair of the Math Department
- Faculty member (teaching two courses per semester)
- Member of the Core Leadership Team of Bates HHMI Inclusive Excellence grant

Key idea: Want to keep a sense of belonging and community -- and not overwhelm/overplan/overschedule. Main advice is to **prioritize** and **streamline**.



Adriana Salerno -- Mathematics.

Extracurricular engagement with students:

- As Chair of the Math Department:
 - Islamic patterns drawing club (every Thursday evening)
 - Math lunch (Thursdays at noon in the quad)
 - Share cool online events (e.g. at MoMath)
- Faculty member (teaching two courses per semester)
 - Mostly, be flexible and present -- life happens.
- Member of the Core Leadership Team of Bates HHMI Inclusive Excellence grant
 - Mentoring students to attend SACNAS remotely
 - Create mentoring triangles for our STEM scholars
 - Develop and strengthen STEM cohort.



Community Building with Peer Mentors and Faculty Support

My Experience

- ✓ Research Poster Competition
- ✓ First Hackathon
- ✓ Chevron SWE Internship
- ✓ Chevron Scholarship (2018 GMIS Scholar)
- ✓ CAHSI Scholar Award + Google Scholarship
- ✓ 3rd Place in GMIS' first Data Analytics Competition - teammate: Shawn Olichwier
- ✓ 5 Job Offers
- ✓ Accenture Full-Time
- ✓ Gained Interview Experience
- ✓ Expanded My Network

Advice/Tips

Pre-GMIS:

- ☐ Polished Resume (Resume Reviewed by UHD CDC)
- ☐ Practice Interview Skills (Behavioral/Technical)
- ☐ Upload Resume to GMIS Database & to Links in Emails Sent by Companies
 - Gets You an Interview Date Set!
- ☐ Sign-Up for GMIS Competitions!
- ☐ Practice Elevator Pitch
- ☐ Create/Update LinkedIn & Download App

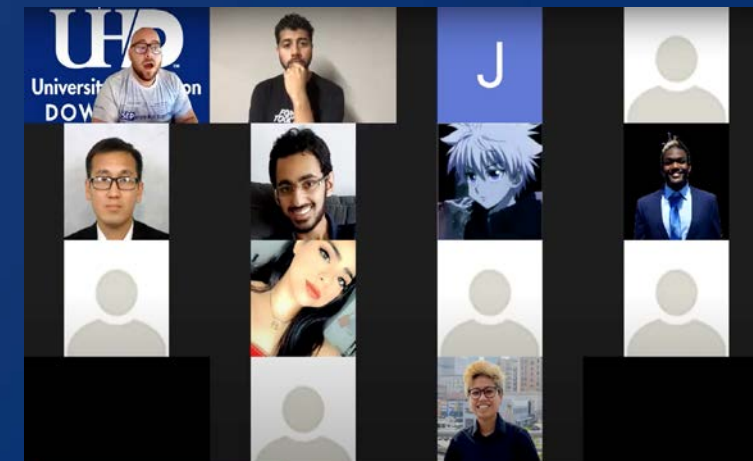
During GMIS:

- ☐ Network = Network
 - Talk to employees/recruiters!
 - This is the time to be outgoing!
 - Be polite & professional
 - LinkedIn QR Code
- ☐ Research Companies of Interest (Interview Prep)
- ☐ Attend Seminars/Workshops/Networking Lunches
- ☐ Encourage/Help Each Other and Have Fun! 😊

Discussion

Prior to GMIS conference, what prior experience did you have?

Describe your mindset entering conference for the first time.



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Institutional Support Systems

Panelists:

Megan Eberhardt-Alstot, California State University,
Channel Islands

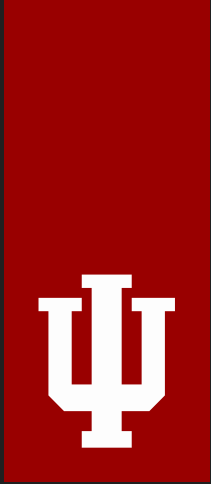
Courtney Williams, Dillard University

Mark Canada, Indiana University Kokomo

Moderator: Al Bryant, Campbell University

Megan Eberhardt-Alstot, California State University,
Channel Islands

Courtney Williams, Dillard University



Success Strategies

- Online Orientations
- KEY Summer Institute
- First-year Seminars
- Faculty Ambassadors
- Faculty Outreach
- *Take Five*
- Pedagogy
- KEY: Experiences
- KEY: Connections

The KEY to Retention



For more information, contact:
Mark Canada, canadam@iuk.edu.

“Personal” Support Systems

Panelists:

Sheryl Burgstahler, DO-IT University of Washington

Laureen Campana, Columbia College

Sara Goldrick-Rab, Temple University

Kamau Bobb, Georgia Tech College of Computing

Moderator: Heather Thiry, University of Colorado Boulder



Creating An Online Course that is Inclusive of Students with Disabilities

Sheryl Burgstahler, Ph.D.
sherylb@uw.edu

Terrill Thompson
tft@uw.edu

Common accommodations for online courses at UW

- Making inaccessible documents accessible, mainly reformatting PDF files
- Captioning videos



Universal Design (UD) =

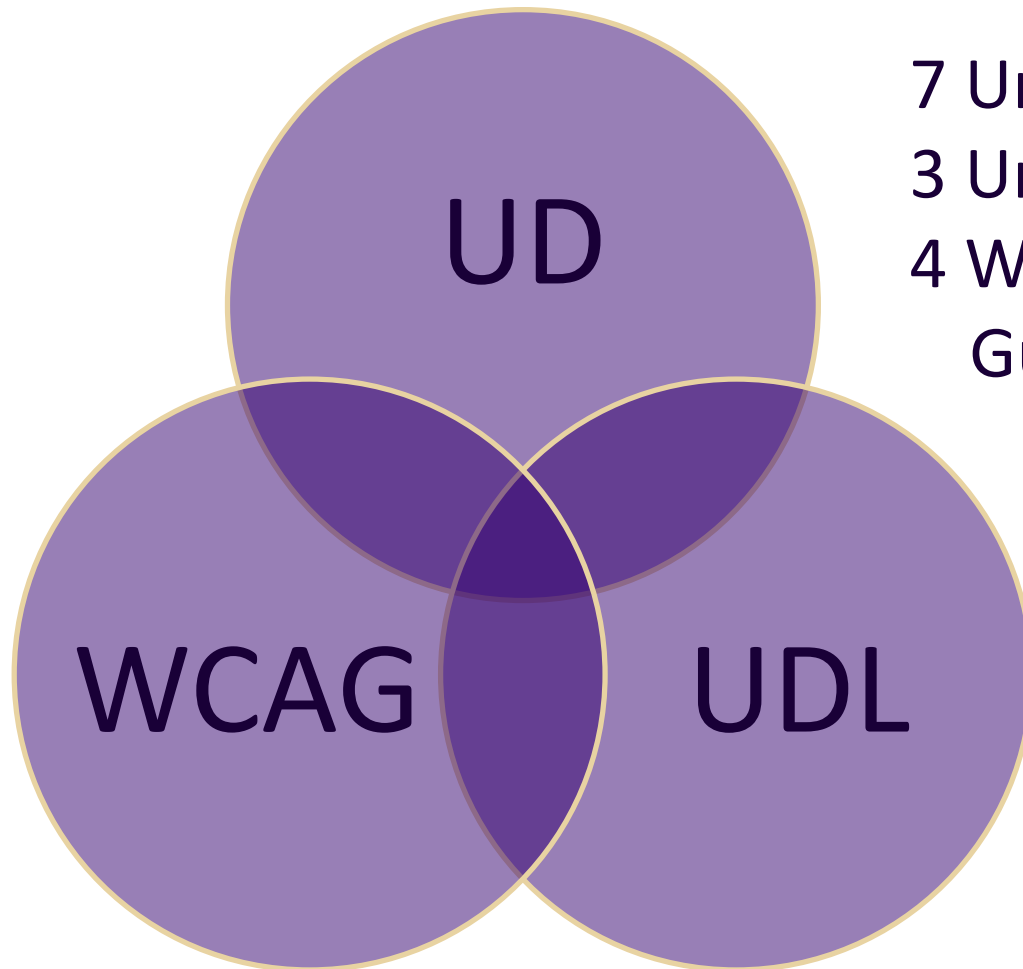
"the design of products & environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design."

The Center for Universal Design

www.design.ncsu.edu/cud



Three sets of principles that underpin UD of online learning:



7 Universal Design
3 Universal Design for Learning
4 Web Content Accessibility
Guidelines

AccessCyberlearning 20 Tips for Teaching an Accessible Online Course

By Sheryl Burgstahler, Ph.D.

I taught the first online learning course at the University of Washington in 1995. My co-instructor was Dr. Norm Coombs, who was, at the time, a professor at the Rochester Institute of Technology. We designed the course to be accessible to anyone, including students who were blind, deaf, or had physical disabilities.



- uw.edu/doit/20-tips-teaching-accessible-online-course
- 9 tips for Web pages, documents, videos
- 11 tips for instructional methods
- includes references

In a nutshell,

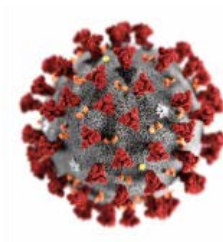
1. Provide multiple ways for students to learn.
2. Provide multiple ways to demonstrate what they have learned.
3. Provide multiple ways to engage.
4. Ensure each of these strategies is accessible to students with a wide variety of disabilities.

California Community Colleges

Optimal Physical / Mental / Social Health

=

Academic Success



The Impact of COVID-19 on Student Health Services Programs

Executive Summary of Survey Results

SUMMER 2020



Key Considerations for Interventions

- Outside the box collaborations
- Meet students where they are – Canvas
- Make it personal
- Make it easy
- Make it accessible
- Offer what they tell you they need and want
 - WC Modules: Housing Support / Food / First Generation / Foster Youth / Mindfulness / Natural Remedies



Data-driven Theory Based Module Design

- RP Group Student Success redefined
- Motivational Interviewing supportive format
- Front page newspaper format design – easy access to information
- Student focus group approved
- #RealCollege survey data
- ACHA-NCHA survey data



Homeless and Housing Support



Overview

If your housing arrangement is unstable or temporary, you may qualify for some special benefits. Even if you do not qualify for an assistance program, this module has information for everyone on where to find help with housing. Please know you are not alone. This is a very common concern for California Community College students. Each campus in the California Community College system is required, by law, to have a Homeless Youth Liaison, and this person can help you determine what benefits you may be eligible for based on your living situation. Any student who lacks a "fixed, regular, and adequate nighttime residence" meets the federal definition of homeless. This includes students that are sleeping in cars, parks, etc. or students who are "couch-surfing".

If you become verified with the Homeless Youth Liaison on your campus, and meet age and other eligibility requirements, you may qualify for the following benefits:

- Priority registration for classes at any California Community College (eligibility requirements apply).



Contact Information

Laureen Campana NP MPH
campanal@yosemite.edu

#RealCollege During the Pandemic

Sara Goldrick-Rab

Hope Center for
College, Community,
and Justice

DATA FROM AN E-SURVEY COMPLETED IN APRIL/MAY 2020 BY



38,602
Students



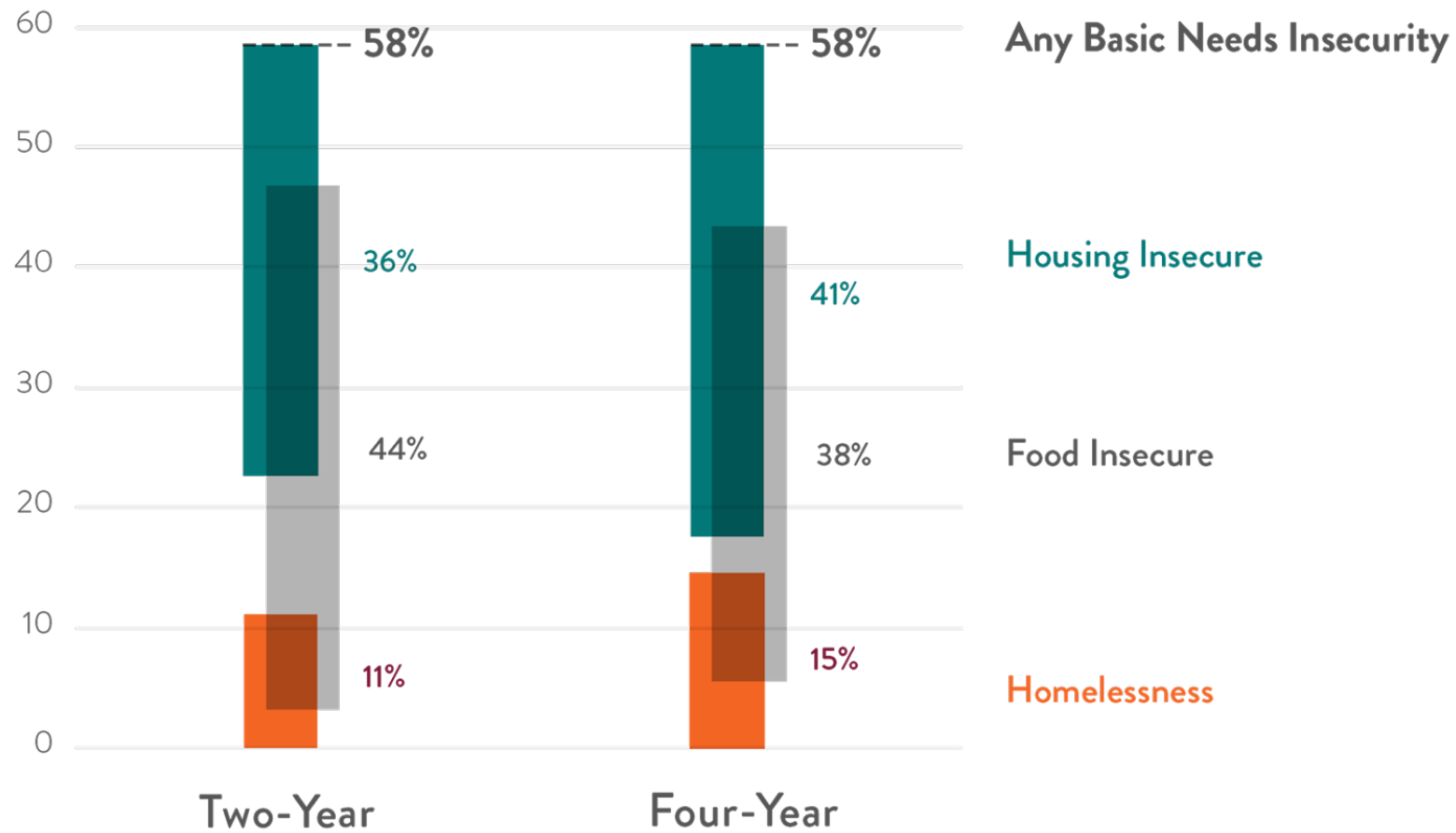
26
States

39
Two-year
Colleges



15
Four-year
Universities

BASIC NEEDS INSECURITY RATES

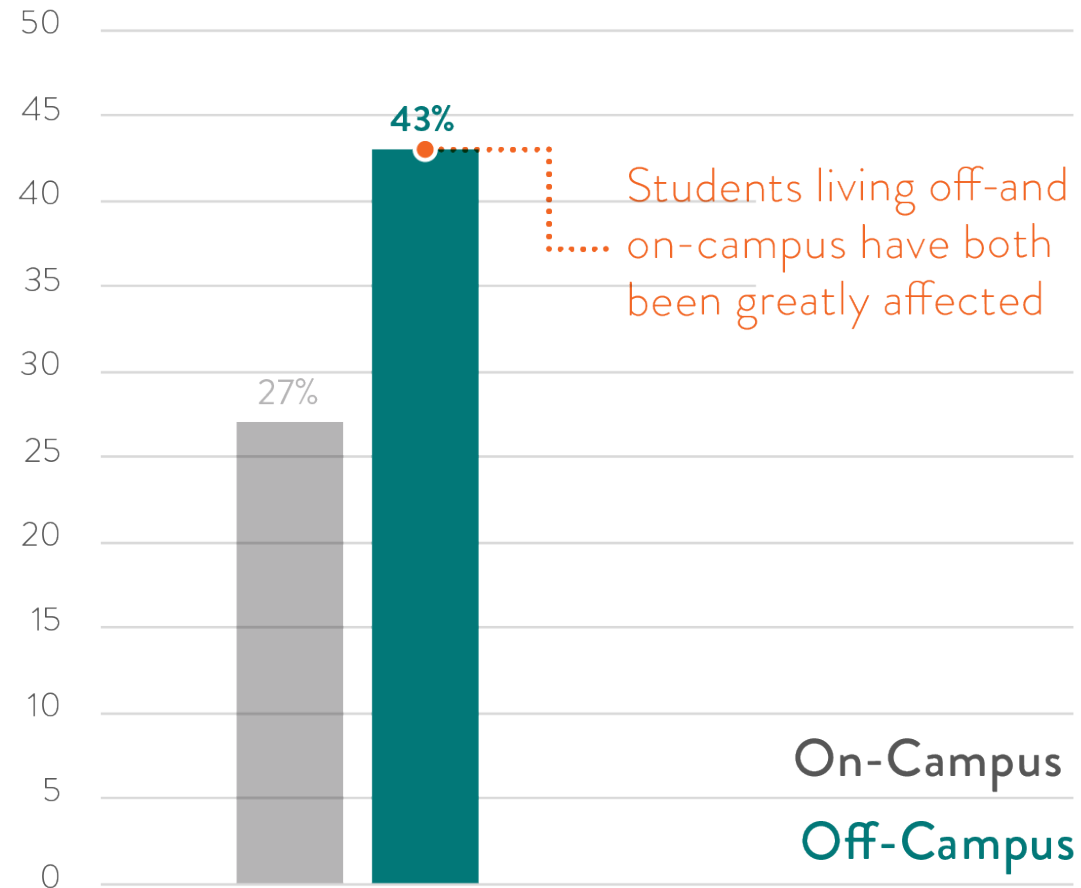




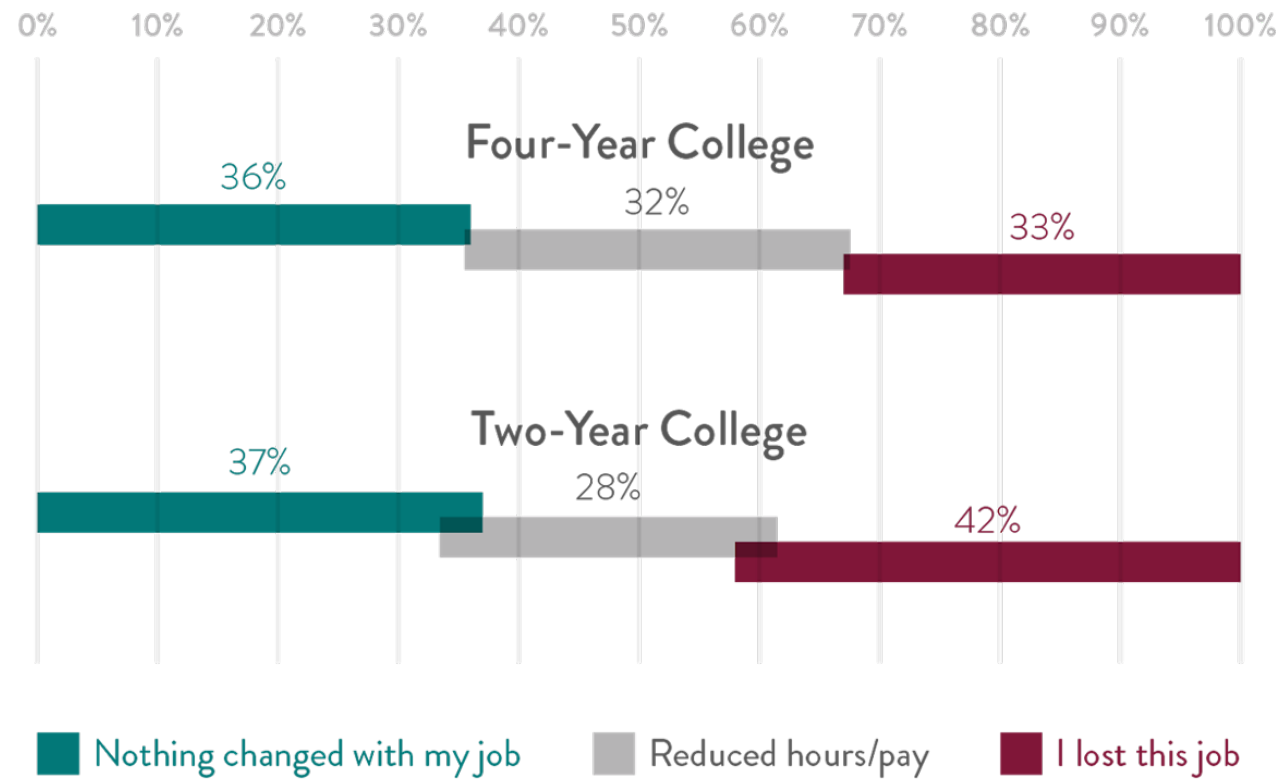
6% of students
reported they are
NOT SAFE
WHERE THEY ARE LIVING



HOUSING INSECURITY



IMPACTS ON JOB INSECURITY AMONG STUDENTS EMPLOYED PRE-PANDEMIC



THE **hope** CENTER

For College, Community, and Justice

HOPE4COLLEGE.COM

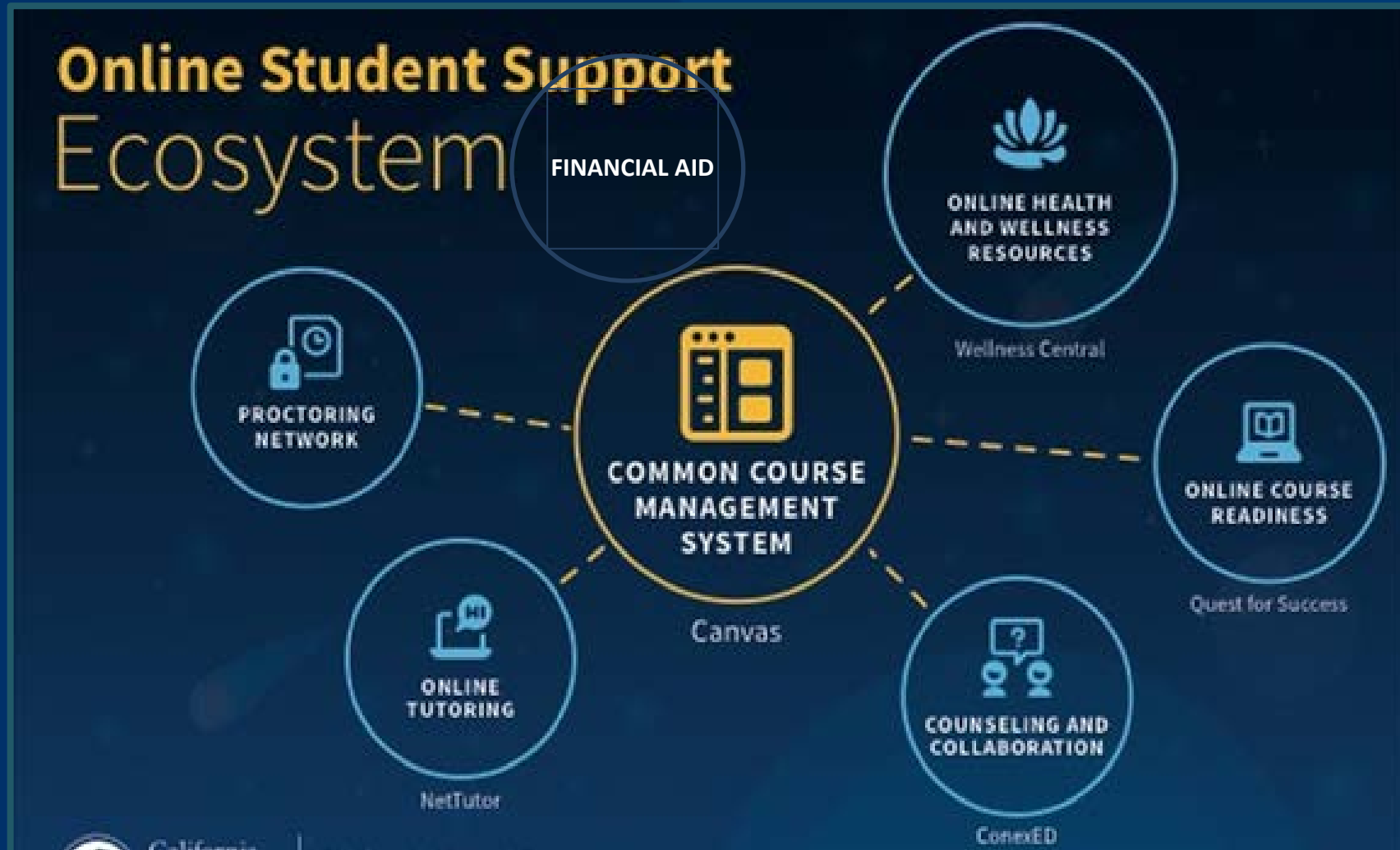
Kamau Bobb, Georgia Tech College of Computing

Closing Remarks

Bonnie Peters, California Virtual Campus – Online Education Initiative

SUPPORTING ONLINE STUDENT EQUITY

CENTRALIZED STUDENT SERVICE HUBS



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