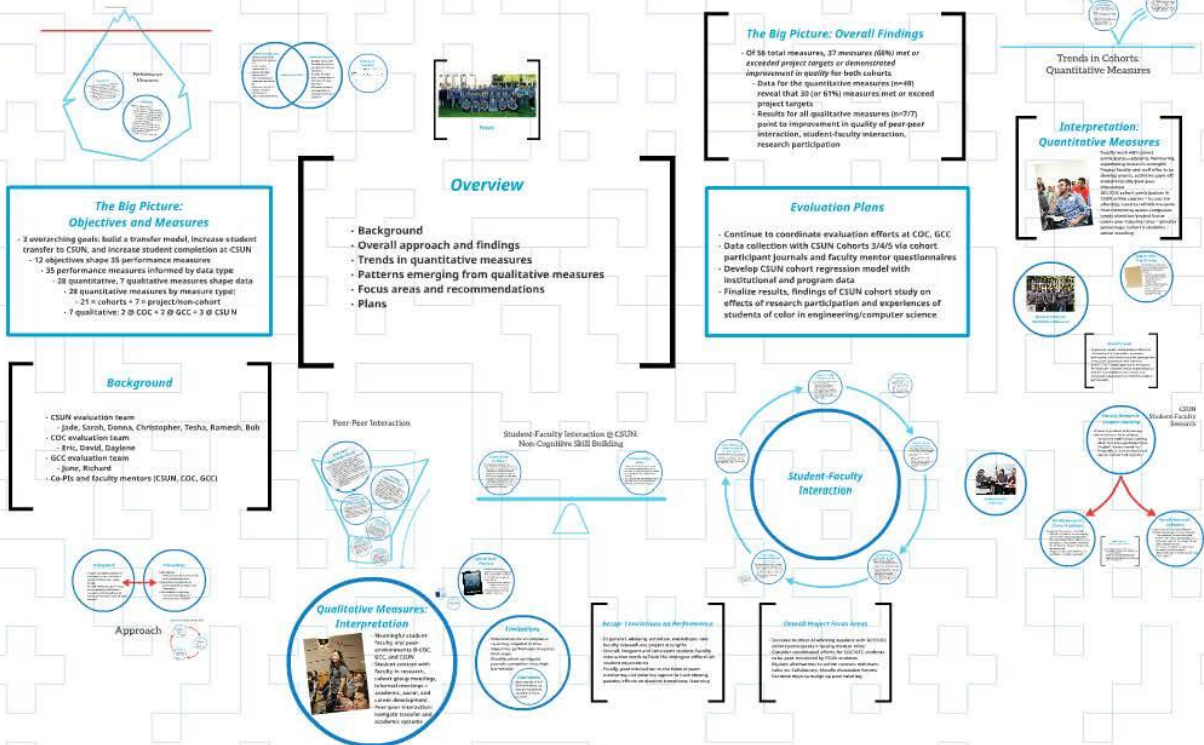
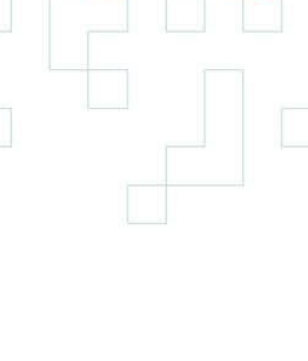
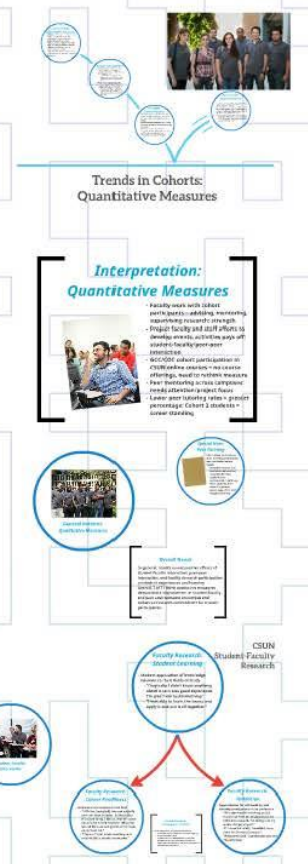
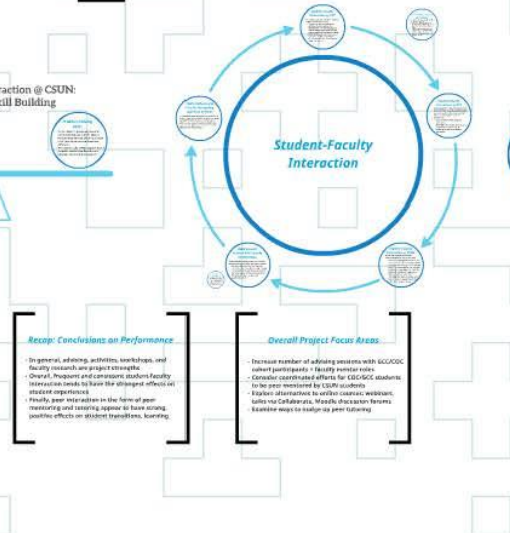
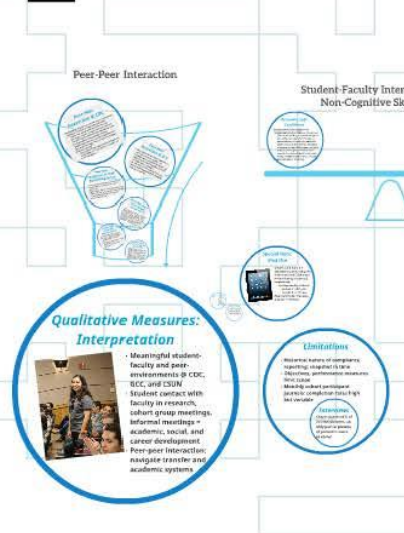
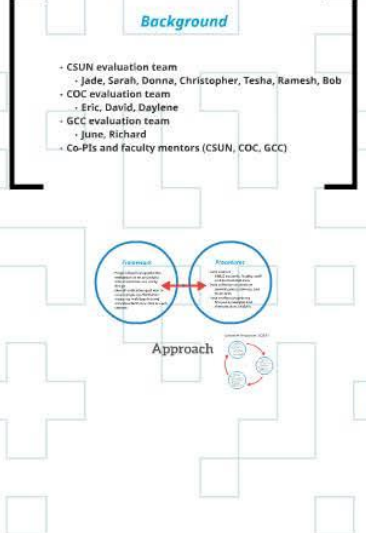
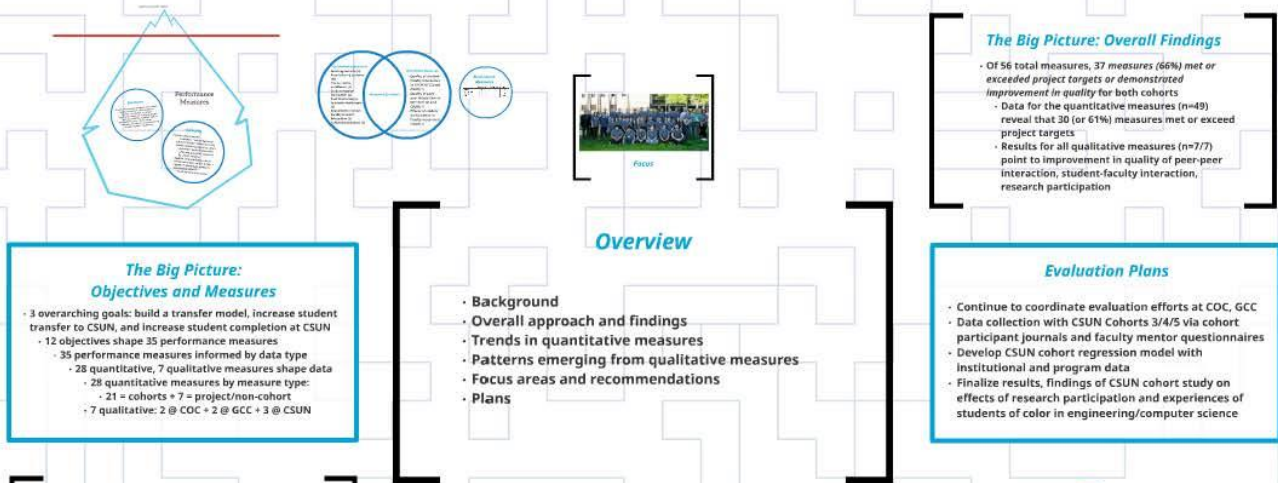


# CSUN Title V/HSI-STEM APR: Year 3



# CSUN Title V/HSI-STEM APR: Year 3





*Focus*



*Focus*

## *Overview*

- **Background**
- **Overall approach and findings**
- **Trends in quantitative measures**
- **Patterns emerging from qualitative measures**
- **Focus areas and recommendations**
- **Plans**



## ***Background***

- **CSUN evaluation team**
  - **Jade, Sarah, Donna, Christopher, Tesha, Ramesh, Bob**
- **COC evaluation team**
  - **Eric, David, Daylene**
- **GCC evaluation team**
  - **June, Richard**
- **Co-PIs and faculty mentors (CSUN, COC, GCC)**

## Framework

- Project objectives guided the evaluation as an embedded mixed methods case study design
- Overall evaluation goal was to assess project performance measures with baseline and actual performance data at each campus

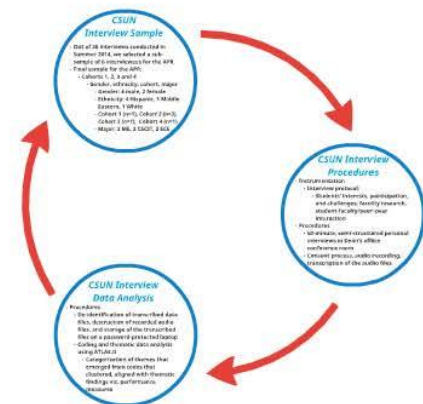
## Procedures

- Data sources
  - AIMS2 students, faculty, staff and institutional data
- Data collection procedures
  - Journal guides, surveys, and interviews
- Data analysis procedures
  - Frequency analysis and thematic data analysis



# Approach

## Interview Procedures @ CSUN



## *Framework*

- Project objectives guided the evaluation as an embedded mixed methods case study design
- Overall evaluation goal was to assess project performance measures with baseline and actual performance data at each campus



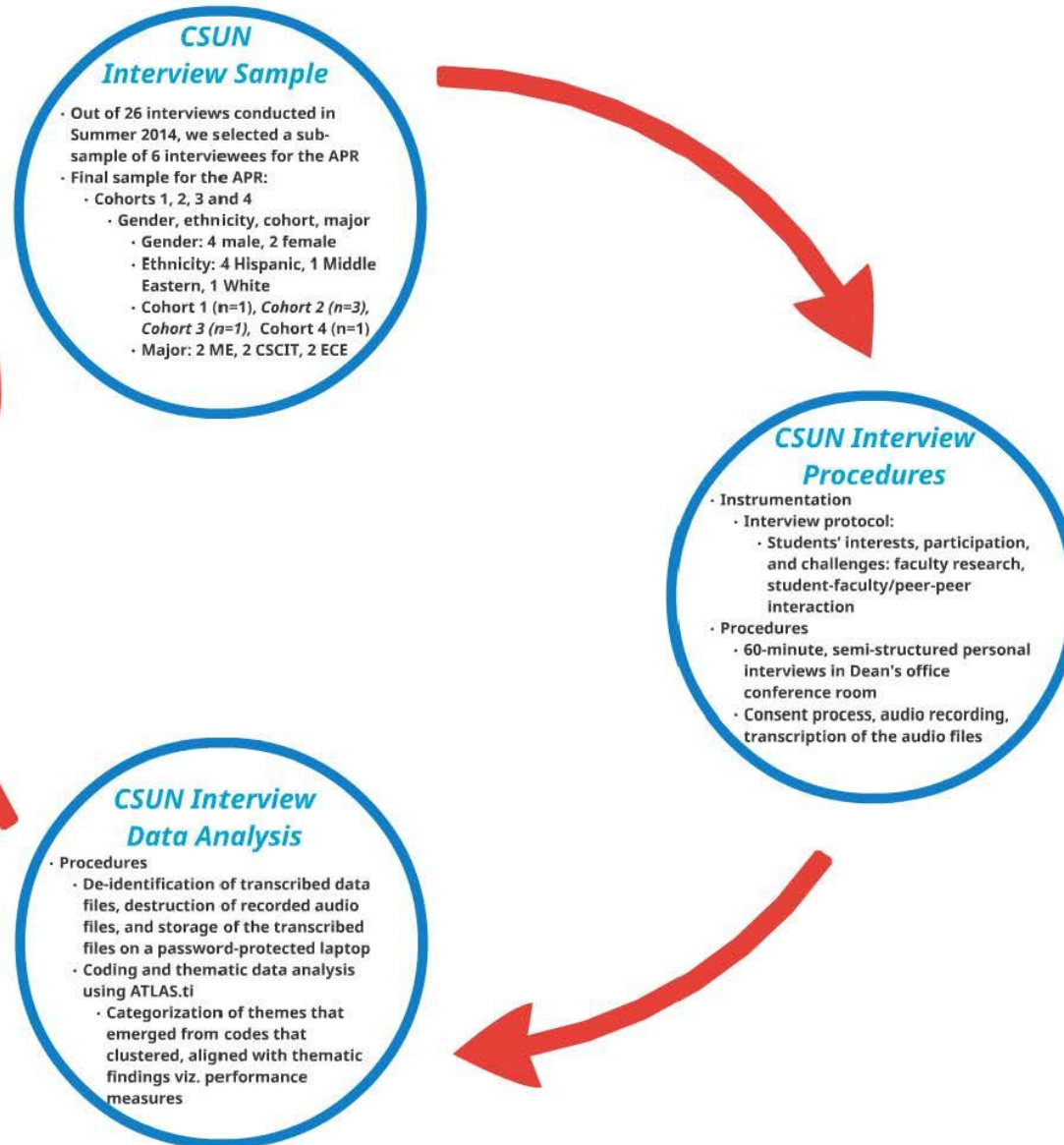




## *Procedures*

- **Data sources**
  - **AIMS2 students, faculty, staff and institutional data**
- **Data collection procedures**
  - **Journal guides, surveys, and interviews**
- **Data analysis procedures**
  - **Frequency analysis and thematic data analysis**

# Interview Procedures @ CSUN





# CSUN

## *Interview Sample*

- Out of 26 interviews conducted in Summer 2014, we selected a sub-sample of 6 interviewees for the APR
- Final sample for the APR:
  - Cohorts 1, 2, 3 and 4
    - Gender, ethnicity, cohort, major
      - Gender: 4 male, 2 female
      - Ethnicity: 4 Hispanic, 1 Middle Eastern, 1 White
      - Cohort 1 (n=1), Cohort 2 (n=3), Cohort 3 (n=1), Cohort 4 (n=1)
      - Major: 2 ME, 2 CSCIT, 2 ECE




# ***CSUN Interview Procedures***

- **Instrumentation**
  - **Interview protocol:**
    - **Students' interests, participation, and challenges: faculty research, student-faculty/peer-peer interaction**
- **Procedures**
  - **60-minute, semi-structured personal interviews in Dean's office conference room**
  - **Consent process, audio recording, transcription of the audio files**



# ***CSUN Interview Data Analysis***

- **Procedures**
    - **De-identification of transcribed data files, destruction of recorded audio files, and storage of the transcribed files on a password-protected laptop**
    - **Coding and thematic data analysis using ATLAS.ti**
      - **Categorization of themes that emerged from codes that clustered, aligned with thematic findings viz. performance measures**
- 

## ***The Big Picture: Objectives and Measures***

- **3 overarching goals: build a transfer model, increase student transfer to CSUN, and increase student completion at CSUN**
  - **12 objectives shape 35 performance measures**
    - **35 performance measures informed by data type**
      - **28 quantitative, 7 qualitative measures shape data**
        - **28 quantitative measures by measure type:**
          - **21 = cohorts + 7 = project/non-cohort**
        - **7 qualitative: 2 @ COC + 2 @ GCC + 3 @ CSUN**



# Performance Measures

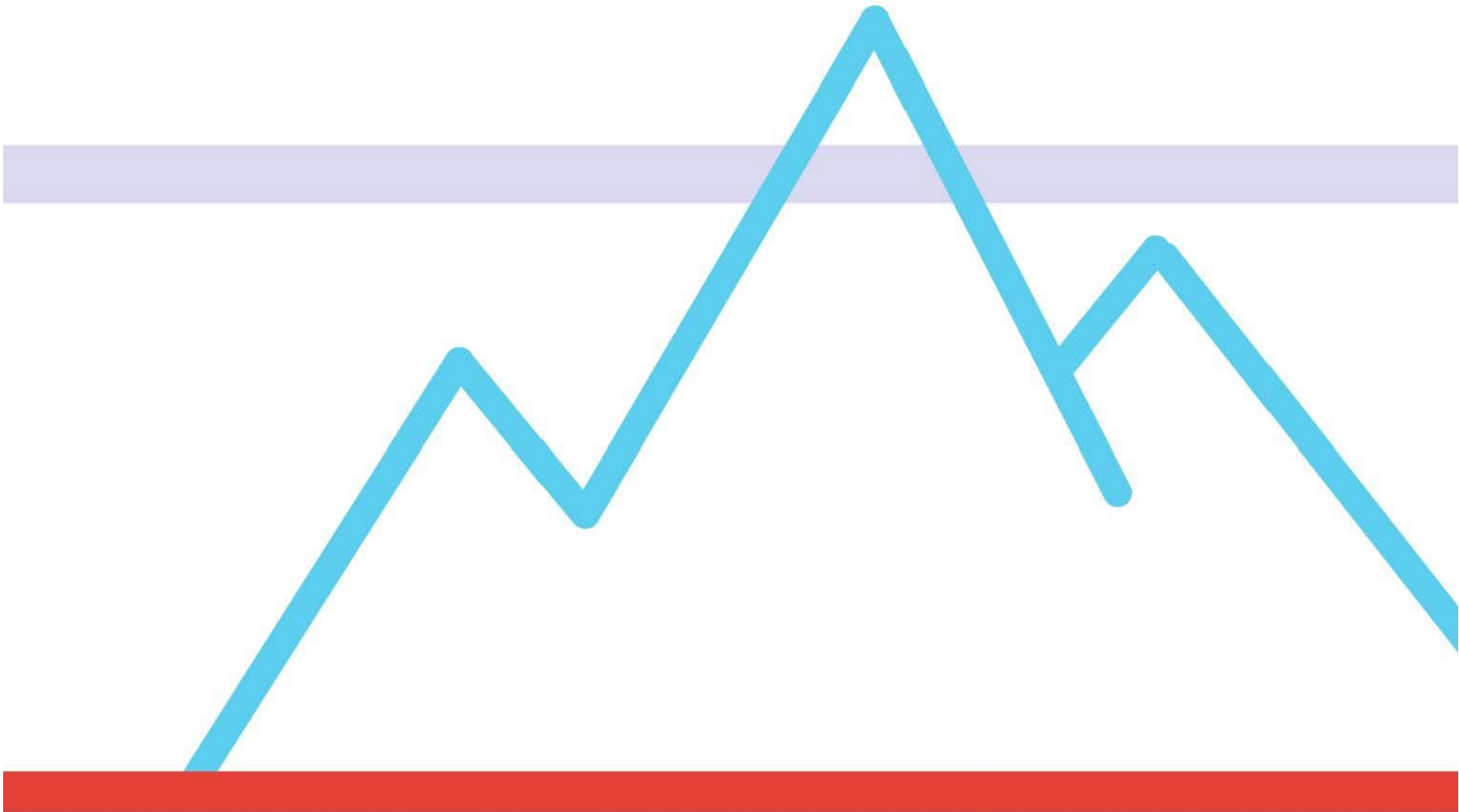
## Measures

- 35 performance measures guide assessment
- 4 project measures = across campuses
  - Transfer, articulation, completion
- 3 non-cohort measures = campus specific
  - Counselor STEM PD, academic advisers
- 28 cohort measures = direct cohort
  - Advising, tutoring, tutoring, mentoring
  - 21 quantitative + 7 qualitative

## Cohorts

- *Project = cohort model:*
  - *Evaluation = cohort approach*
- Cohort 2 (Fa12) + Cohort 3 (Fa13):
  - assess cohort measures by cohort
    - Baseline + performance data collected, analyzed, assessed by cohort targets
- Applied 21 quantitative cohort measures to *each* cohort (n=42) + applied 7 qualitative measures *across* cohorts (n=7)
- Total: 49 cohort measures

# Cohorts and Measures: In-Depth



# Performance Measures

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- 4 project measures = across campuses
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The diagram consists of two overlapping blue circles. The left circle is labeled 'Quantitative Measures' and contains a list of nine items with counts in parentheses. The right circle is labeled 'Qualitative Measures' and contains a list of three items with counts in parentheses. The overlapping area in the center is labeled 'Measures by Cohort'. The background features a light purple grid pattern.

### *Quantitative Measures*

- Advising sessions (6)
- Peer/tutoring sessions (12)
- Online course enrollment (4)
- Student-faculty interaction (6)
- Peer mentoring (6)
- Academic workshops (2)
- Supplemental lab (2)
- Faculty research interaction (2)
- Cohort participation (2)

### *Measures by Cohort*

### *Qualitative Measures*

- Quality of student-faculty interaction at GCC/COC (2) and CSUN (1)
- Quality of peer-peer interaction at GCC/COC (2) and CSUN (1)
- Effects of student participation in faculty research at CSUN (1)

***Quantitative Measures***

- Advising sessions (6)
- Peer/tutoring sessions (12)
- Online course enrollment (4)
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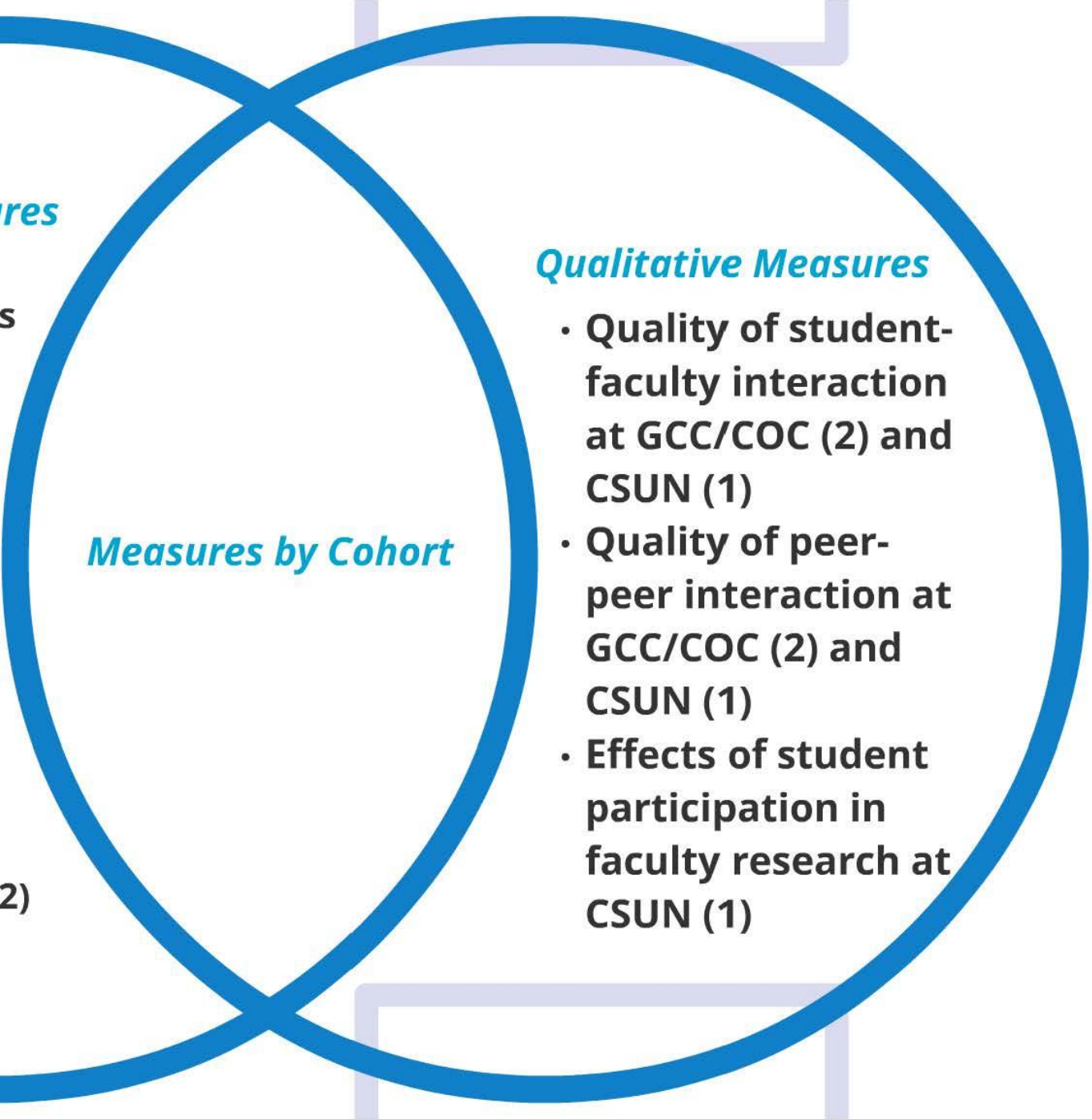
***Qualitative***

- Quality faculty i at GCC/CSUN (1)
- Quality peer int GCC/CO CSUN (1)
- Effects c particip faculty r CSUN (1)



**Quantitative Measures**

- Sessions (6)
- Training sessions
- Course (4)
- Faculty (6)
- Training (6)
- Workshops
- Virtual lab (2)
- Research (2)
- Participation (2)



**Qualitative Measures**

- Quality of student-faculty interaction at GCC/COC (2) and CSUN (1)
- Quality of peer-peer interaction at GCC/COC (2) and CSUN (1)
- Effects of student participation in faculty research at CSUN (1)

Project
Non-C
Cohort
<b>Total</b>

## *Final Count: Measures*

	Quantitative		Qualitative	<i>Total</i>
Project	4		0	<b>4</b>
Non-Cohort	3		0	<b>3</b>
Cohort	21	21	7	<b>49</b>
<b>Total</b>	<b>49</b>		<b>7</b>	<b>56</b>

## ***The Big Picture: Overall Findings***

- ***Of 56 total measures, 37 measures (66%) met or exceeded project targets or demonstrated improvement in quality for both cohorts***
  - **Data for the quantitative measures (n=49) reveal that 30 (or 61%) measures met or exceed project targets**
  - **Results for all qualitative measures (n=7/7) point to improvement in quality of peer-peer interaction, student-faculty interaction, research participation**

**Overall Trends:  
Quantitative Measures**

- All 4 project measures—transfer (1a), course articulation (2a/b), and completion (7a) met or exceeded project targets in the period
- All 3 non-cohort measures—Counselor STEM PD (3a) at GCC/COC, academic advisors at CSUN (8a)—met or exceeded project targets
- 31 of 49 (63%) cohort measures across campuses met or exceeded targets in the period

**Transfer/Completion**

- Transfer achievement exceeded target
  - 64 new CSUN transfer students entered in 2013-14 from COC/GCC in a field housed in CECS
  - 178% increase over the project target (n=6) and a 305% increase over baseline figure (n=21) from 2010-11
- Program completion exceeded target
  - 35.2% (60/153) completed a degree program for the most recent period vs. 30.9% (21/68) project target
  - Increase over first project year of 29.1% (22/75) and a slight increase over second project year of 38.8% (n=31/80)

**Strengths:  
Cohort Measures**

- GCC/COC counselor STEM PD steady
- COC academic advising in Cohort 2 up, COC/GCC student-faculty interaction way up
- Student-faculty interaction at all three campuses dramatically increased during the period
- Consistent and strong student participation in CSUN faculty research
- CSUN academic advising, peer mentoring in Cohort 2 increased

**Focus Areas:  
Cohort Measures**

- Academic advising at GCC/COC generally did not meet project targets
- Peer/tutoring participation at CSUN a mixed bag—with exception: Cohort 3 peer tutoring
- Academic workshops, supplemental labs at CSUN generally fell below targets
- Cross-campus collaborative cohort measures
  - GCC/COC: online CSUN course enrollment
  - CSUN cohort peer mentoring of GCC/COC cohort fell below targets



# Trends in Cohorts: Quantitative Measures



## ***Overall Trends: Quantitative Measures***

- **All 4 *project measures***—transfer (1a), course articulation (2a/b), and completion (7a) met or exceeded project targets in the period
- **All 3 *non-cohort measures***—Counselor STEM PD (3a) at GCC/COC, academic advisors at CSUN (8a)—met or exceeded project targets
- **32 of 49 (65%) *cohort measures*** across campuses met or exceeded targets in the period

## ***Transfer/Completion***

- ***Transfer achievement*** exceeded target
  - 64 new CSUN transfer students entered in 2013-14 from COC/GCC in a field housed in CECS
    - 178% increase over the project target (n=36) and a 305% increase over baseline figure (n=21) from 2010-11
- ***Program completion*** exceeded target
  - 39.2% (60/153) completed a degree program for the most recent period vs. 30.9% (21/68) project target
    - Increase over first project year of 29.3% (22/75) and a slight increase over second project year of 38.8% (n=31/80)

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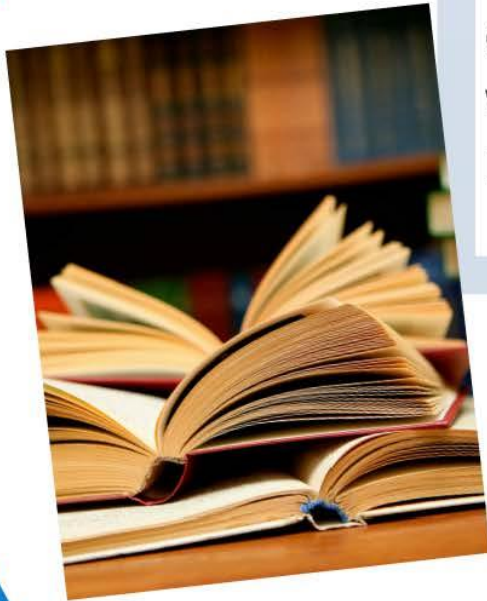
# *Interpretation:*

## *Quantitative Measures*



- Faculty work with cohort participants—advising, mentoring, supervising research: strength
- Project faculty and staff efforts to develop events, activities pays off: student-faculty/peer-peer interaction
- GCC/COC cohort participation in CSUN online courses = no course offerings, need to rethink measure
- Peer mentoring across campuses: needs attention/project focus
- Lower peer tutoring rates = greater percentage: Cohort 2 students = senior standing

## ***Special Note: Peer Tutoring***



- While mixed performance data, tutoring participation was distributed across majors
  - Computer science and electrical engineering recorded the most students who participated in tutoring
- More students from Cohort 2, greater percentage of Cohort 3 engaged tutoring



***General Patterns:  
Qualitative Measures***



## *Overall Trends*

- **In general, results reveal positive effects of student-faculty interaction, peer-peer interaction, and faculty research participation on student experiences and learning**
- **Overall, 7 of 7 (100%) qualitative measures demonstrate improvement in student-faculty and peer environments on campus and enhanced research environment for student participation**



# CSUN Student-Faculty Research

## *Faculty Research: Student Learning*

- Student application of knowledge relevant to their fields of study
  - “Originally I didn’t know anything about it so it was good experience. I’m glad I learned something.”
  - “I was able to learn the basics and apply it and put it all together.”

## *Faculty Research: Career Readiness*

- Preparation for careers in the field
  - “With the [redacted], we can actually save our data because [redacted] so it’s a cool thing. I like it. And the other equipment is very modern. Whatever we ask [for], we can get it at the main equipment lab.”
  - “I figure if I put down working on a satellite [it] is pretty impressive.”

## *Faculty Research: Challenges for Students*

- Work obligations, academic performance:
  - “There was a lot. It kept me from participating in those opportunities.”
  - “I was kind of limited because my GPA had dropped since I had gone back to work and wasn’t able to maintain those grades as much as I would have wanted to.”

## *Faculty Research: Validation*

- Opportunities for skill building and identity development in the profession
  - “This summer I’m working on the [redacted] with Dr. [redacted] so it’s different research. I’m doing it as my senior design project.”
  - “If I wasn’t in AIMS, I wouldn’t have done the [reacted] project.”
  - “[Redacted] said, ‘I would take you into my company.’”

## ***Faculty Research: Student Learning***

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***Student-Faculty  
Interaction***

# Student-Faculty Interaction

### Student-Faculty Interaction @ COC

• Mentoring, academic and career advising shapes student experiences  
• "I have been able to develop two relationships with faculty that participated in the (AMSI2) program. This has helped me to bond with and interact with these professors outside of the classroom. One has become a mentor to me. (The professor) is guiding and advising me through my engineering career."

### COC Student Contact with Faculty

• Student experiences, relationships building with faculty @ COC, 1/18/19  
• "I have been able to get to know and connect with my physics professor and meet with the benefits for my career."  
• "They provided a STEM (I have met many professors from COC and from the other areas) and they are friendly, helpful and interested in the progress of my learning."

### Student-Faculty Interaction @ GCC

• Guest speakers, including faculty from GCC and CSUN, have attended monthly sessions, presented a range of STEM issues and disciplines to cohort participants:  
• How different STEM fields are connected  
• How different science theories are applicable to day-to-day life  
• Process/benefits of graduate education

### Student-Faculty Interaction @ CSUN

• Beneficial contact, meaningful relationships with faculty mentors  
• "I always sought guidance from Prof. (redacted) here. (Redacted) was kind of like the person to go to if I had any issues for any problems. I'm not able to take this class. What can I do? She would offer different suggestions, different paths I could take."  
• "Dr. (redacted) gave us advice and told us what we needed to do and asked how we were doing."

### CSUN Student Contact with Faculty as Mentoring

• Shaping student experiences via, industry, professional internships, job opportunities.  
• "(Redacted) helped me a lot with the internship. (Redacted) was really friendly and (redacted) helped me to get familiar with my courses. Those were the main things that helped me get very comfortable here."

### John and Nancy Henningy @ CSUN

• "I have been able to get to know and connect with my physics professor and meet with the benefits for my career."  
• "They provided a STEM (I have met many professors from COC and from the other areas) and they are friendly, helpful and interested in the progress of my learning."

### CSUN Students and Faculty: Navigating Academic Systems

"I would ask ways to improve my studying in order to get better grades. How can I improve myself? What kind of sources can I get in order to get a better understanding of the concepts taught in class? They were really helpful with these things."

## ***Student-Faculty Interaction @ COC***

- **Mentoring: academic and career advising shapes student experiences**
  - **“I have been able to develop two relationships with faculty that participated in the [AIMS2] program. This has helped me to bond with and interact with these professors outside of the [classroom]. One has become a mentor to me. [The professor] is guiding and advising me through my engineering career.”**



## ***COC Student Contact with Faculty***

- **Student involvement, relationship-building with faculty @ COC, CSUN**
  - **“I have been able to get to know and connect with [my] physics professor and speak with [the instructor] about stem topics.”**
  - **“They are related to STEM. I have met many professors from CSUN and from COC that have helped me get involved in school and extracurricular pro-grams engineering based.”**

## ***Student-Faculty Interaction @ GCC***

- **Guest speakers, including faculty from GCC and CSUN, have attended monthly sessions, presented a range of STEM issues and disciplines to cohort participants:**
  - **How different STEM fields are connected**
  - **How different science theories are applicable to day-to-day life**
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## ***More on Faculty Mentoring @ CSUN***

- **“They tell you about all of the internships and opportunities going on. [Redacted] always sending out a bunch of emails about opportunities. [Redacted] always showing us these are the jobs that match your field.”**
- **“Dr. [redacted]...started teaching. I asked [redacted] once why [redacted] did that and [redacted] just said [redacted] preferred teaching...got a Ph.D. in engineering and started teaching.”**

# ***CSUN Students and Faculty: Navigating Academic Systems***

**“I would ask ways to improve my studying in order to get better grades. How can I improve myself? What kind of sources can I get in order to get a better understanding of the concepts taught in class? They were really helpful with these things.”**

# Student-Faculty Interaction @ CSUN: Non-Cognitive Skill Building

## *Academic Self-Confidence*

- Encouragement and support for developing beliefs in abilities to succeed
- "[Redacted] still goes ahead and gives us confidence and when we get to points where we might be stuck she shall bring in either former students or people in the field to give us a little help and we'll go from there. And because [redacted] gives us so much freedom I think that's where we get the confidence from that."

## *Problem-Solving Skills*

- "I even told Dr. [redacted] about it. And [redacted] just told me that [it was] strange but you should just blow it off. Just do better and show him different."
- "If I wasn't in the AIMS program then I probably would have floundered a little bit...but I had that support."

## *Academic Self-Confidence*

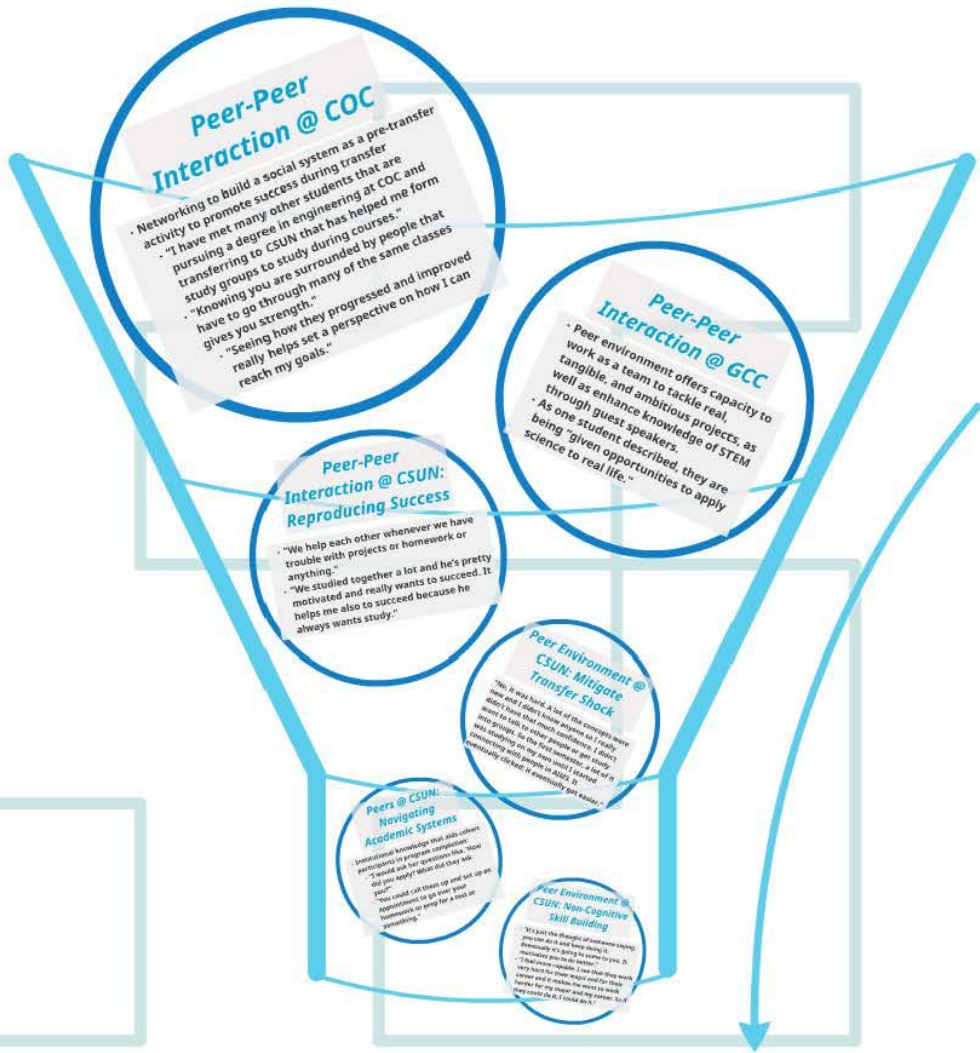
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# Peer-Peer Interaction



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# *Peer-Peer Interaction @ COC*

- Networking to build a social system as a pre-transfer activity to promote success during transfer
  - "I have met many other students that are pursuing a degree in engineering at COC and transferring to CSUN that has helped me form study groups to study during courses."
  - "Knowing you are surrounded by people that have to go through many of the same classes gives you strength."
    - "Seeing how they progressed and improved really helps set a perspective on how I can reach my goals."



## *Peer-Peer Interaction @ GCC*

- Peer environment offers capacity to work as a team to tackle real, tangible, and ambitious projects, as well as enhance knowledge of STEM through guest speakers.
- As one student described, they are being “given opportunities to apply science to real life.”



## *Peer-Peer Interaction @ CSUN: Reproducing Success*

- "We help each other whenever we have trouble with projects or homework or anything."
- "We studied together a lot and he's pretty motivated and really wants to succeed. It helps me also to succeed because he always wants study."

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## *Peer Environment @ CSUN: Mitigate Transfer Shock*

**“No, it was hard. A lot of the concepts were new and I didn’t know anyone so I really didn’t have that much confidence. I didn’t want to talk to other people or get study into groups. So the first semester, a lot of it was studying on my own until I started connecting with people in AIMS. It eventually clicked; it eventually got easier.”**

# *Peers @ CSUN: Navigating Academic Systems*

- Institutional knowledge that aids cohort participants in program completion:
  - "I would ask her questions like, 'How did you apply? What did they ask you?'"
  - "You could call them up and set up an appointment to go over your homework or prep for a test or something."





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## *Peer Environment @ CSUN: Non-Cognitive Skill Building*

- **“It’s just the thought of someone saying you can do it and keep doing it. Eventually it’s going to come to you. It motivates you to do better.”**
- **“I feel more capable. I see that they work very hard for their major and for their career and it makes me want to work harder for my major and my career. So if they could do it, I could do it.”**



## *Special Note: iPad Use*



- Cohort 2 and Cohort 3 students reported using the iPad 13,365 and 5,554 times in total during the period, respectively.
  - Average use by student:
    - Cohort 2 = 461 uses
    - Cohort 3 = 617 uses
- Peak months for iPad use = Aug-Oct + Feb-May

### *More on iPad Use:*

#### *Academic Tasks*

- "My iPad has drastically improved my academic experience. I can do all my homework on my iPad and read all my books"
- "I've been using 'computer networking' app lately. It gives me lots of information about Cisco, preparing me to get a Cisco certificate"
- "It is the ultimate tool to have for referencing and keeping track of tasks as well as having instant access to applications"



## ***More on iPad Use: Academic Tasks***

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- **"It is the ultimate tool to have for referencing and keeping track of tasks as well as having instant access to applications"**



## ***More on iPad use: Peer/Social Interaction***



- "I use it everyday to communicate via email...."
- "...networking with others...sharing those special moments such as graduation pictures in social networks"
- "...it has also become my primary means of web browsing"



# *Qualitative Measures: Interpretation*



- Meaningful student-faculty and peer-environments @ COC, GCC, and CSUN
- Student contact with faculty in research, cohort group meetings, informal meetings = academic, social, and career development
- Peer-peer interaction: navigate transfer and academic systems

What is the role of the student-faculty relationship in the success of a student?

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## *Limitations*

- **Historical nature of compliance reporting: snapshot in time**
- **Objectives, performance measures limit scope**
- **Monthly cohort participant journals: completion rates high but variable**

## *Interviews*

- **Share stories of 6 of 26 interviewees, so only partial picture of patterns: more to come!**

## ***Recap: Conclusions on Performance***

- **In general, advising, activities, workshops, and faculty research are project strengths**
- **Overall, frequent and consistent student-faculty interaction tends to have the strongest effects on student experiences**
- **Finally, peer interaction in the form of peer mentoring and tutoring appear to have strong, positive effects on student transitions, learning**

## *Overall Project Focus Areas*

- Increase number of advising sessions with GCC/COC cohort participants = faculty mentor roles
- Consider coordinated efforts for COC/GCC students to be peer mentored by CSUN students
- Explore alternatives to online courses: webinars, talks via Collaborate, Moodle discussion forums
- Examine ways to nudge up peer tutoring

## ***Evaluation Plans***

- **Continue to coordinate evaluation efforts at COC, GCC**
- **Data collection with CSUN Cohorts 3/4/5 via cohort participant journals and faculty mentor questionnaires**
- **Develop CSUN cohort regression model with institutional and program data**
- **Finalize results, findings of CSUN cohort study on effects of research participation and experiences of students of color in engineering/computer science**



# CSUN Title V/HSI-STEM APR: Year 3

