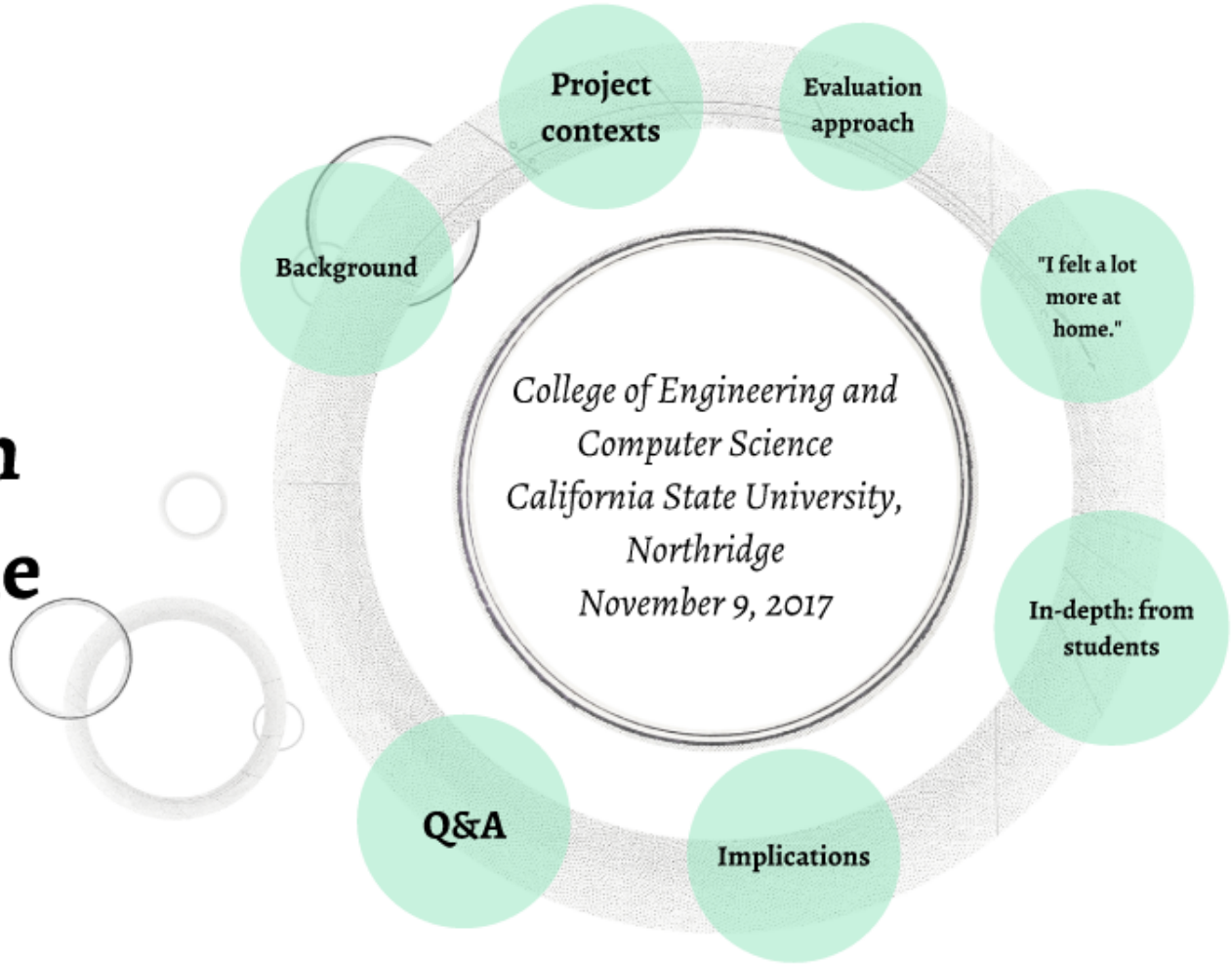
Final Performance Report: Findings from Years 1-6 of the 2011 AIMS2 Project



Background

A bit about the evaluation team and USDE performance reporting

Team

Performance reporting

Report structure

Data presentation

Team

Team

CSUN faculty mentors

Team

CSUN faculty mentors

GCC and COC faculty mentors and project staff

Team

CSUN faculty mentors

Project PI and co-PIs at CSUN and CECS office staff

GCC and COC faculty mentors and project staff

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Project PI and co-PIs at CSUN and CECS office staff

GCC and COC faculty mentors and project staff

CSUN project evaluation team members

Team

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Project PI and co-PIs at CSUN and CECS office staff

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GCC and COC faculty mentors and project staff

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Performance reporting

Performance reporting

Federal agency compliance

U.S. Department of Education requires annual submission of a report (ED 524B) with a project status update

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Oct. 1 - Sept. 30

Performance reporting

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Year 1 = Oct. 1, 2011-Sept. 30, 2012
Year 2 = Oct. 1, 2012-Sept. 30, 2013
Year 3....

Performance reporting

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Oct. 1 - Sept. 30

Year 1 = Oct. 1, 2011-Sept. 30, 2012
Year 2 = Oct. 1, 2012-Sept. 30, 2013
Year 3....

Local project support

FPR framework informs decision making and project improvement in implementation (formative) and outcomes (summative) at the end of six years

Did the program succeed? If so, what program components were most effective?

Report structure

Report structure

SECTION A - Performance Objectives Information and Related Performance Measures Data

Report structure

SECTION A - Performance Objectives Information and Related Performance Measures Data

SECTION B - Budget Information

Report structure

SECTION A - Performance Objectives Information and Related Performance Measures Data

- *Project objective*
- *Performance measure*
- *Performance measure data*
- *Explanation of progress*
  - *Evaluation data sources and methods*
  - *Description of findings*
  - *Description of project activities*
  - *Plans to use performance measure data*

SECTION B - Budget Information

Data presentation

Data presentation

Frequency data on performance measures: percents and counts

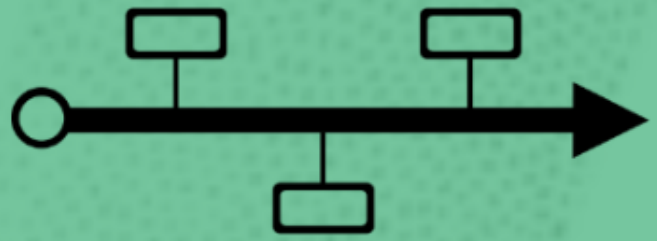
Data presentation

Frequency data on performance measures: percents and counts

Actual performance measure data in relation to baseline data + target data → growth rate or percent change in performance measures

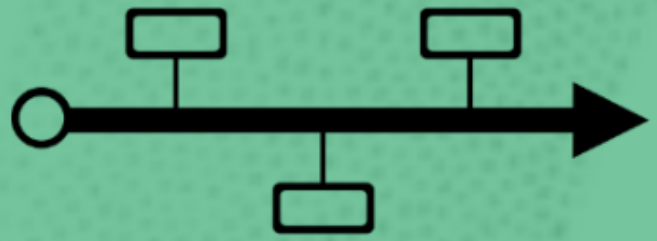
Summative focus: longitudinal trends

Summative focus: longitudinal trends



2011-12: **Year 1**
2012-13: **Year 2**
2013-14: **Year 3**
2014-15: **Year 4**
2015-16: **Year 5**
2016-17: **Year 6**

Summative focus: longitudinal trends



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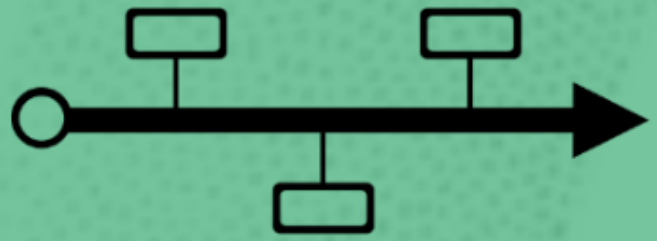
Explore performance measure data by cohort and project year over the six-year project award

Summative focus: longitudinal trends



2011-12: **Year 1**
2012-13: **Year 2**
2013-14: **Year 3**
2014-15: **Year 4**
2015-16: **Year 5**
2016-17: **Year 6**

Cohort **1**: Project Years **1 and 2**
Cohort **2**: Project Years **2 and 3**
Cohort **3**: Project Years **3 and 4**
Cohort **4**: Project Years **4 and 5**
Cohort **5**: Project Years **5 and 6**
Cohort **6**: Project Years **5 and 6**
Cohort **7**: Project Year **6**

Explore performance measure data by cohort and project year over the six-year project award

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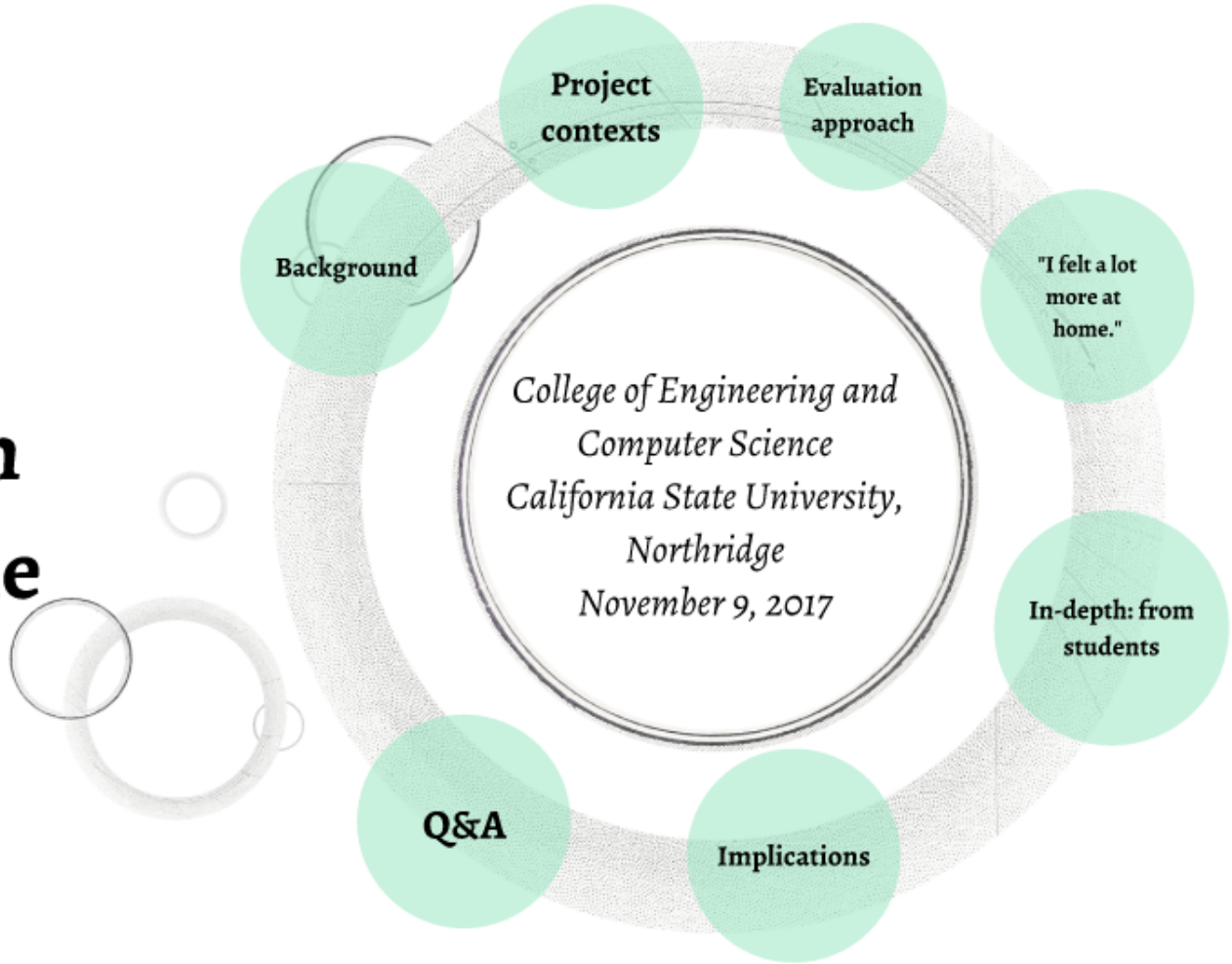

Project contexts

AIMS2 project goals, objectives, and performance measures

Guiding a project

Goals

Objectives

Performance measures

Guiding a project

Guiding a project

Goals

Guiding a project

Objectives

Goals

Guiding a project

Goals

Objectives

Performance measures

Goals

(1) To increase the number of Hispanic and low-income students who successfully transfer from Glendale Community College and College of the Canyons to California State University to pursue majors in Engineering and/or Computer Science

(2) To increase the number of Hispanic and low-income students who graduate from CSU Northridge with degrees from CECS undergraduate programs

(3) To develop a model, seamless transfer program to assist Hispanic and low-income students to successfully transfer from Glendale Community College and College of the Canyons, to California State University

Objectives

GCC and COC

(1) Increase the **transfer of Hispanic and low-income students** from College of the Canyons and Glendale Community College to CSUN in STEM fields
(2) Increase the **number of courses that articulate** from College of the Canyons and Glendale Community College to CSUN and articulation agreements between College of the Canyons and Glendale Community College and CSUN
(3) Enhance the **academic advising/counseling capacity** of College of the Canyons and Glendale Community College in STEM fields
(4) Enhance the **academic participation/transfer readiness rate** of College of the Canyons and Glendale Community College students in STEM fields
(5) Increase and enhance **student-faculty interaction** at College of the Canyons and Glendale Community College with CSUN faculty in STEM fields
(6) Enhance the **peer environment** of College of the Canyons and Glendale Community College students in STEM fields
(7) Increase the **program completion of Hispanic and low-income students in STEM fields**
(8) Enhance the **academic advising capacity in STEM** fields at CSUN
(9) Enhance the **academic participation rate** of CSUN students in STEM classes, particularly in classes identified as barriers to retention, persistence, and completion in STEM fields
(10) Enhance the **research participation rate** of CSUN students in STEM fields
(11) Increase and enhance **student-faculty interaction** in STEM fields at CSUN
(12) Enhance the **peer environment** of CSUN students in STEM fields

CSUN

Performance measures

Connected to 12 objectives, 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, mentoring, participating in workshops

In-depth: performance measures

In-depth: performance measures

Quantitative measures (21)

Advising sessions (3)

Peer/tutoring sessions (6)

Online course enrollment (2)

Student-faculty interaction (3)

Peer mentoring (3)

Academic workshops (1)

Supplemental lab (1)

Faculty research interaction (1)

Cohort participation (1)

In-depth: performance measures

Quantitative measures (21)

Advising sessions (3)

Peer/tutoring sessions (6)

Online course enrollment (2)

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In-depth: performance measures

Quantitative measures (21)

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Online course enrollment (2)
Student-faculty interaction (3)
Peer mentoring (3)
Academic workshops (1)
Supplemental lab (1)
Faculty research interaction (1)
Cohort participation (1)

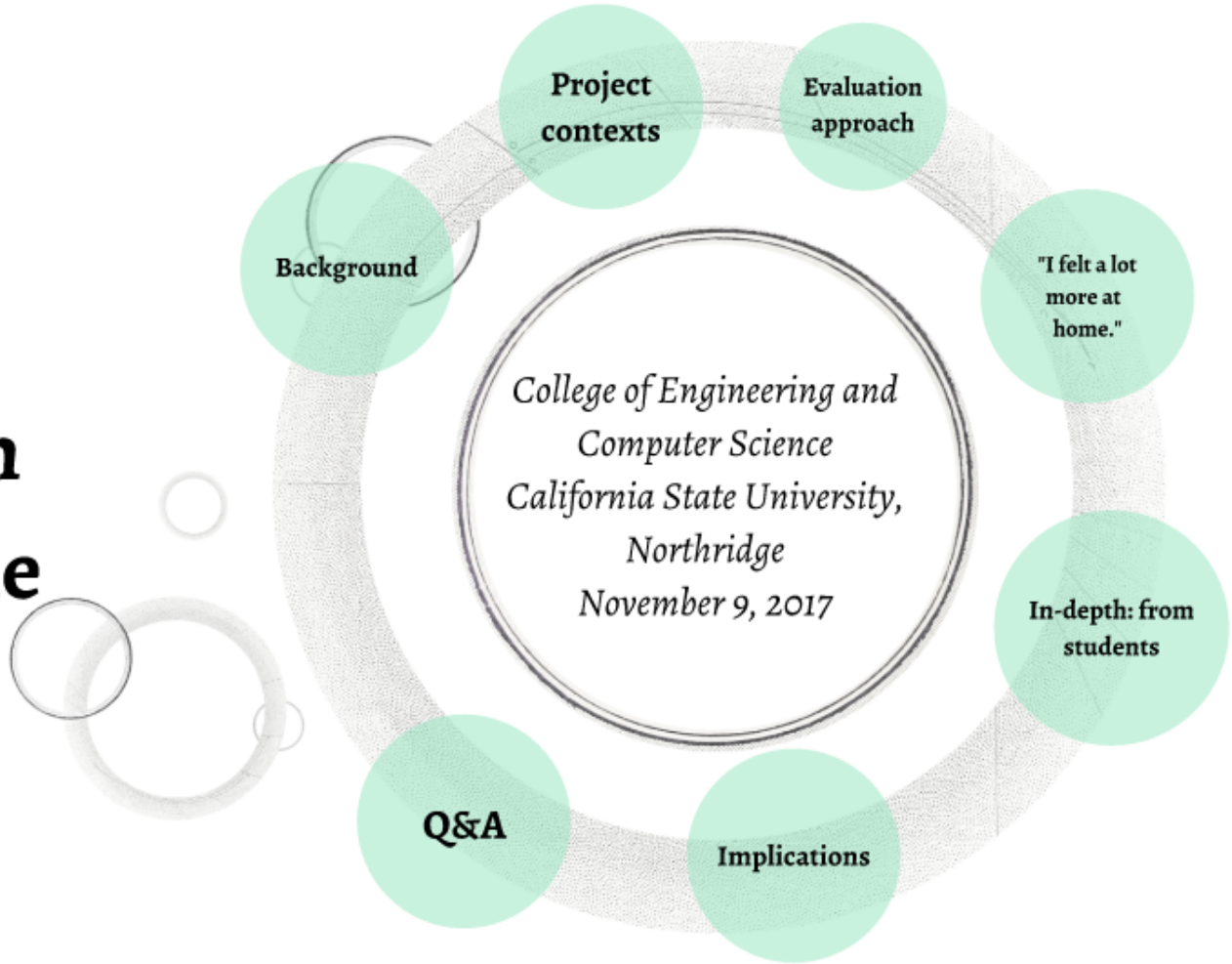
Qualitative measures (7)

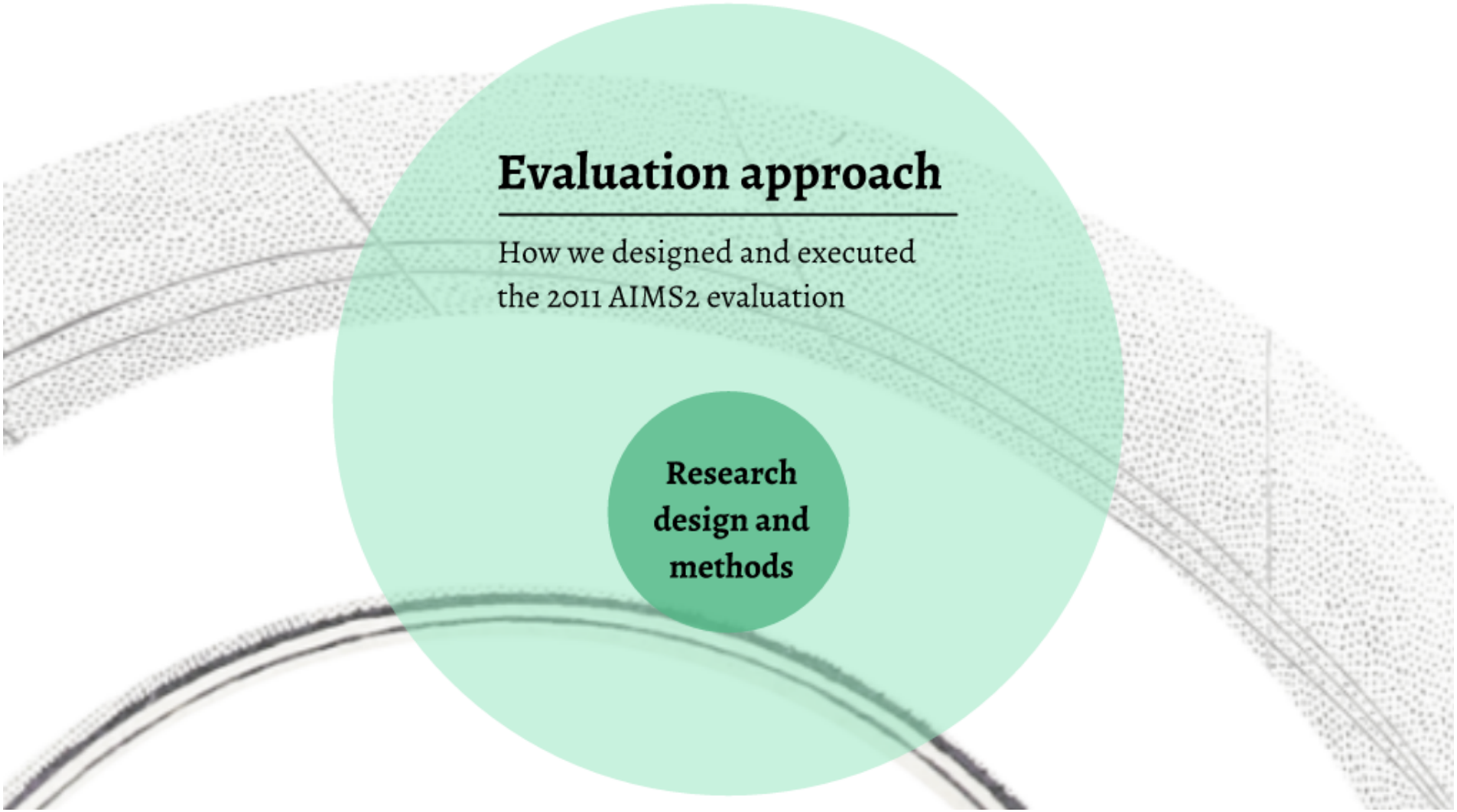
Quality of student-faculty interaction at GCC/COC (2) and CSUN (1)

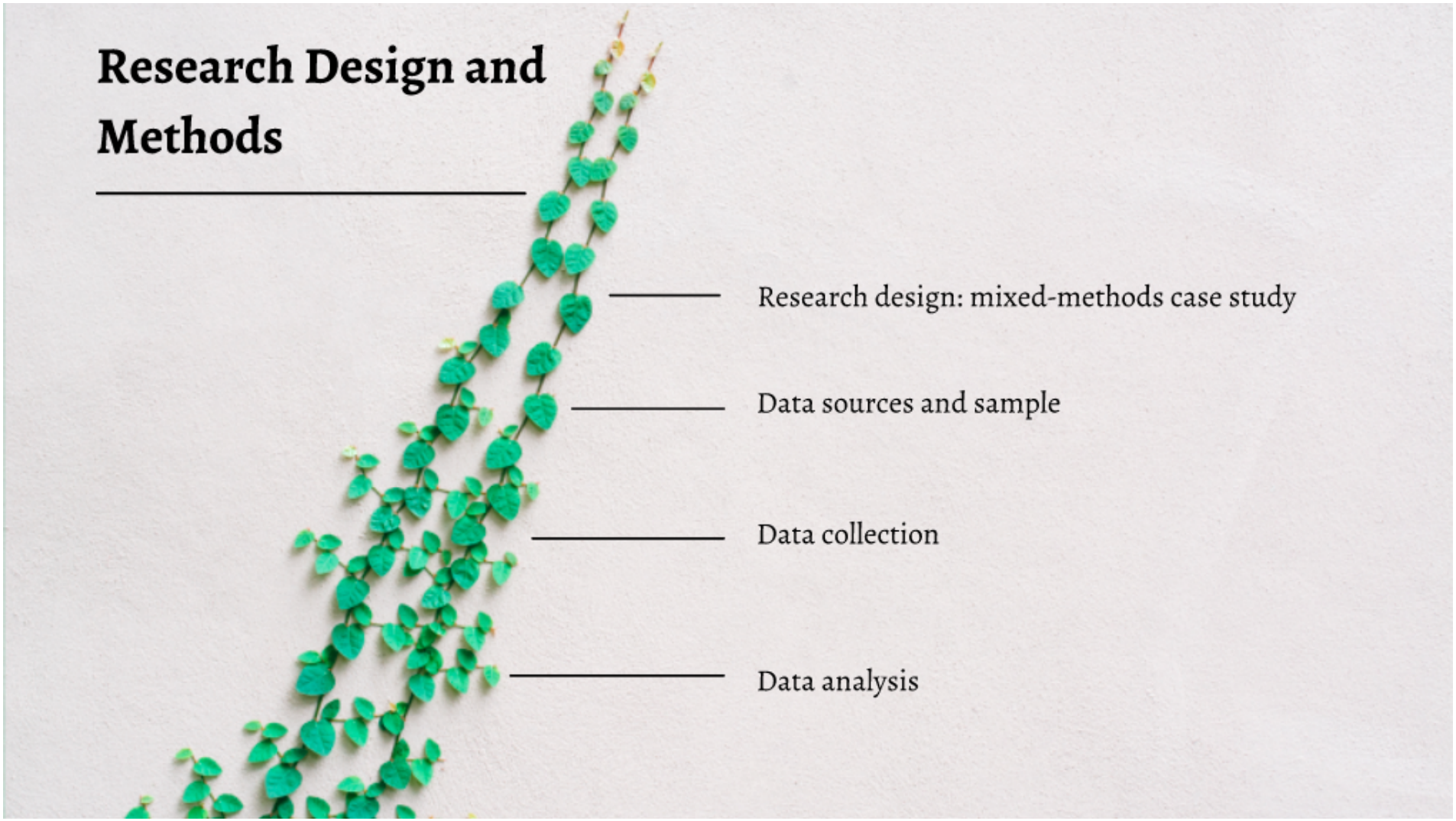
Quality of peer-peer interaction at GCC/COC (2) and CSUN (1)

Effects of student participation in faculty research at CSUN (1)

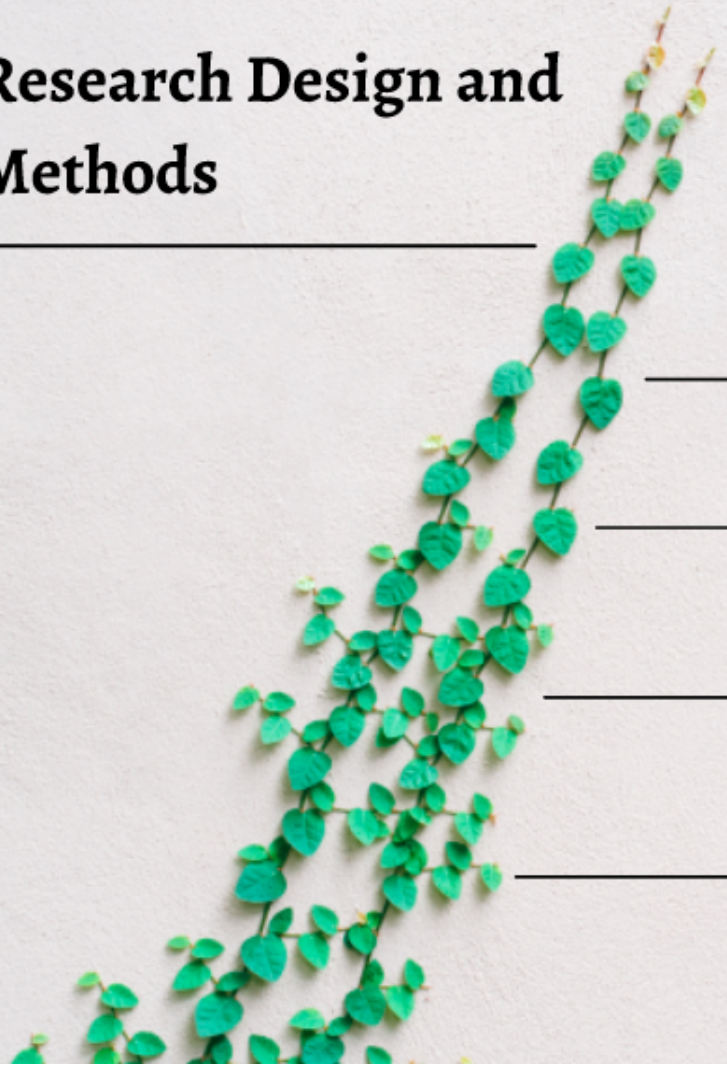
Final Performance Report: Findings from Years 1-6 of the 2011 AIMS2 Project




Evaluation approach
How we designed and executed the 2011 AIMS2 evaluation
Research design and methods


Research Design and Methods
Research design: mixed-methods case study
Data sources and sample
Data collection
Data analysis

Research Design and Methods



Research design: mixed-methods case study

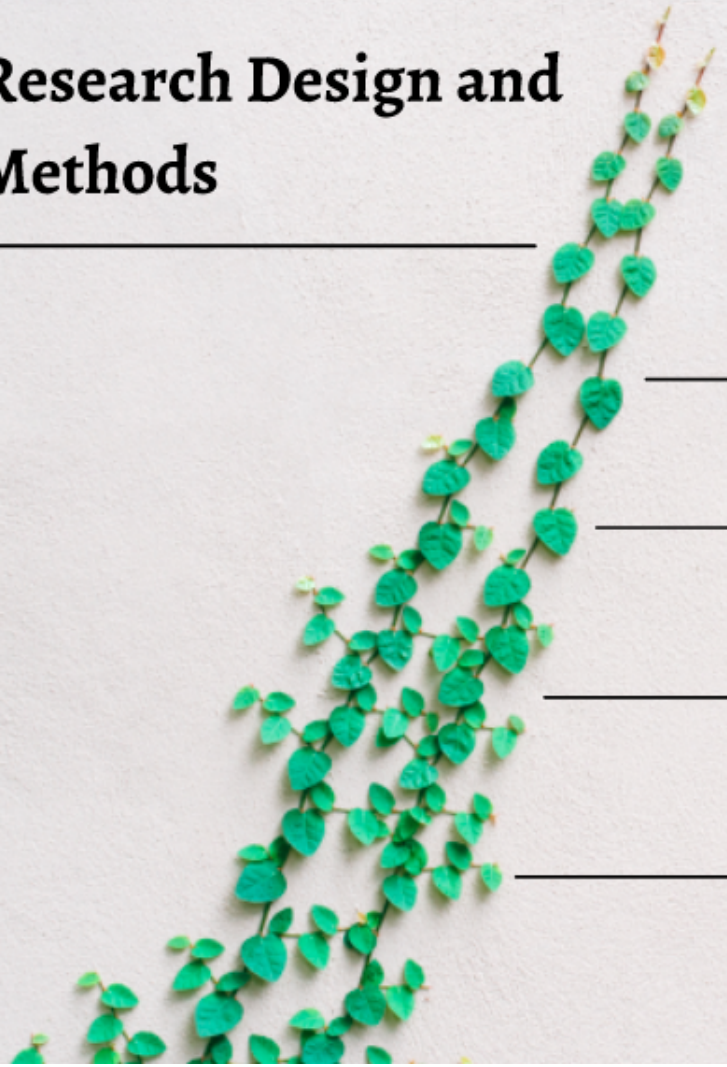
AIMS2 @ GCC, COC, and CSUN

Data sources and sample

Data collection

Data analysis

Research Design and Methods



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AIMS2 @ GCC, COC, and CSUN

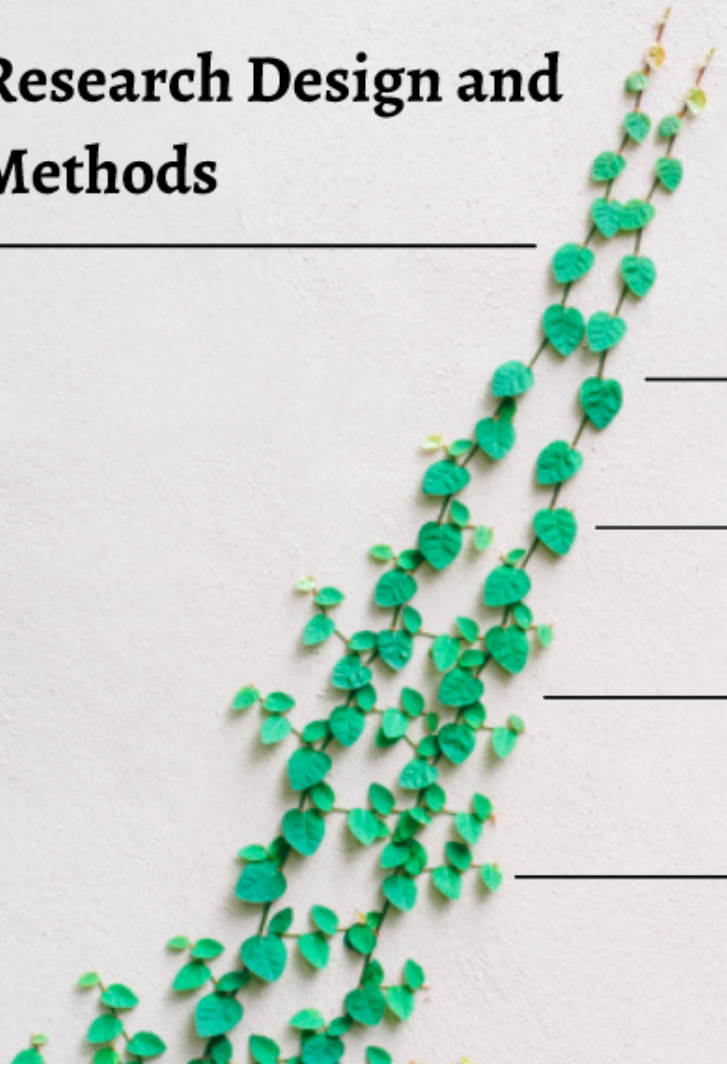
Data sources and sample

Students and faculty in AIMS2 @ GCC, COC, and CSUN

Data collection

Data analysis

Research Design and Methods



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Data sources and sample

Students and faculty in AIMS2 @ GCC, COC, and CSUN

Data collection

Institutional data, surveys, student structured journals, faculty mentor questionnaires, personal interviews

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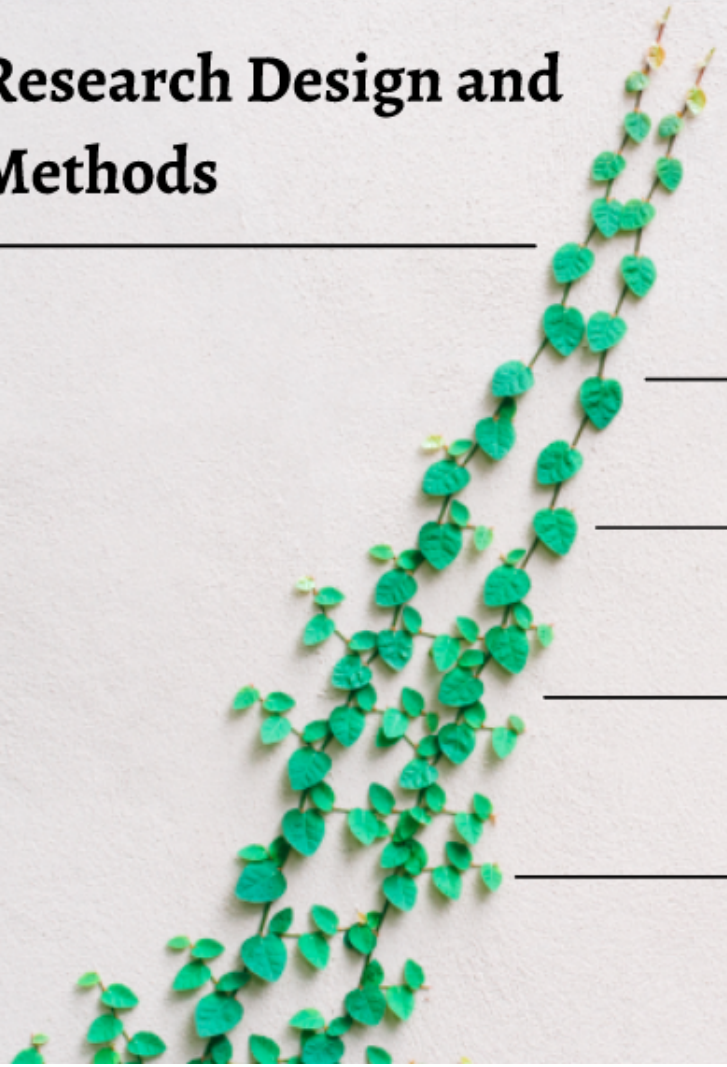

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Data analysis

Frequency data analysis, thematic data analysis

AIMS2 at GCC, COC, and CSUN

AIMS2's focus on supporting Latino/a and low-income students directed evaluation design

Guided by project objectives and performance measures, project activities informed data collection instruments and procedures to explore how participaton shaped student experiences and outcomes.

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Faculty mentoring
Faculty research participation
Peer mentoring and tutoring
Participation in professional societies

AIMS2's faculty mentoring

Student assignment with engineering or computer science faculty at GCC, COC, and CSUN

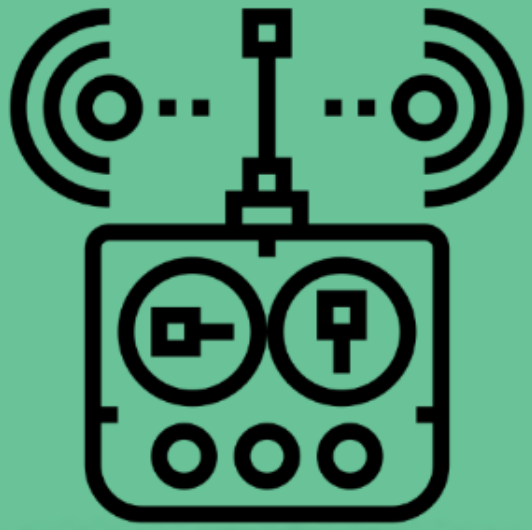
Frequent small group faculty and counselor meetings with students

Academic advising and career planning with faculty and counselors

Strong, consistent student-faculty interaction

Student leadership opportunities--peer mentoring

Summer research with faculty in AIMS2



Student summer research assistantships with CSUN faculty

Part-time, paid positions in an egineering or computer science lab/university research setting

Collaborative student-faculty and student peer-peer interaction

Dissemination of research work

Peer tutoring and mentoring in AIMS2

Mentoring relationships and tutoring activties among students in egnineering and computer science at GCC, COC, and CSUN

Formal and informal student-student interaction in faculty group meetings, workshops, socials

CSUN AIMS2 students with senior-standing work directly with students who recently transferred to CSUN

Participation in professional associations

Funded student membership in and travel to professional enginering socities like Society for Hispanic Professional Engineers

Supported student participation in Hispanic Engineer National Achievement Awards Conference's (HENAAC) Great Minds in STEM conference

Offered AIMS2 students opportunities to apply for support for federal agency internship programs sponsored by the Hispanic Association of Colleges and Universities (HACU) and HENAAC

Data sources/sample: student participants

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Structured journals @ CSUN

All AIMS2 student participants in Cohorts 1-7
invited to complete a journal entry each month

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Cohort 1: 25/29
Cohort 2: 27/29
Cohort 3: 9/9
Cohort 4: 28/28
Cohort 5: 8/10
Cohort 6: 5/7
Cohort 7: 23/27

Total Cohorts 1-6: 125/139

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Interviews @ CSUN

Stratified purposeful sampling strategy of students in Cohorts 1-4 by gender and major. Total sample of 24 interviewees in FPR consisted of 19 men, 5 women with 13 Latina/Latino, 4 Middle Eastern, 4 White, 1 Asian/Asian American, 1 Other, 1 Decline to State with 8 ME, 7 CSCIT, 5 ECE, 3 CECM, 1 MSE

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Presented here: Subset of 9 Latino men, 2 Mexican American men, and 3 Latina women (*self-identified*) with 6 ME, 5 CSCIT, 2 ECE, and 1 CECM

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Surveys and interviews @ GCC

Online student survey and interviews with AIMS2 student participants

Questionnaire and program data @ COC

Survey questionnaire and program data for MESA/ AIMS2 student participants

Data sources/sample: CSUN faculty mentors

Faculty mentor questionnaires

Tenure-track and tenured faculty in CECS (one to two faculty members per department) at CSUN

Eight AIMS2 faculty mentors from computer science, civil engineering, mechanical engineering, electrical engineering, and manufacturing systems engineering

Five men and three women identified as white (n=2), Latino/a (n=2), Indian (n=1), and Middle Eastern (n=2), and unreported (n=1)

Data collection @ CSUN

Data collection @ CSUN

AIMS2 student participants

Completed and submitted monthly structuered journals on Moodle from Spring 2012 to Fall 2017

Participated in personal interviews in Summer and Fall 2014 focusing on faculty research, student-faculty/peer-peer interaction, and validation

60-minute, semi-structured interviews in CECS conference room followed by transcription + de-identification

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AIMS2 faculty mentors

Eight AIMS2 faculty mentors completed online structured journal entries at the end of each regular academic term and summer session between Spring 2012 and Summer 2017

Quantitative data analysis @ GCC, COC, CSUN

Frequency (descriptive) data analysis of surveys, questionnaires, and structured journals AND institutional/program data

Data analysis with interviews @ CSUN

Data analysis with interviews @ CSUN

Digitally recorded and transcribed interviews, then imported transcribed interview data into ATLAS.ti, a qualitative analysis software progrm

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Segmented, coded, and clustered text into meaningful groups that could be further investigated using validation theory

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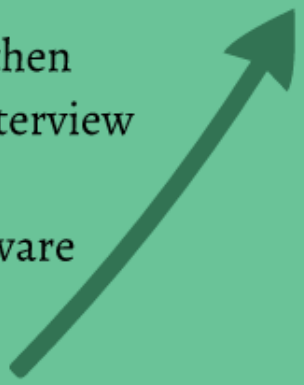

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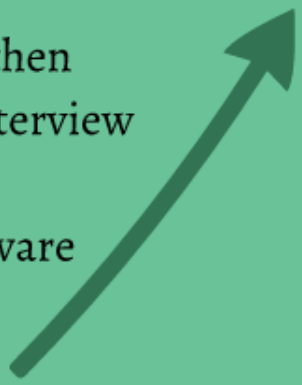

Explored Rendón's types of validation—***academic and interpersonal***—identifying data segments associated with validating experiences and labeling them in relation to AIMS2 program work

Employed an **inter-rater analytical strategy**, creating codes, links between and among codes, and eventually identified a set of preliminary patterns in segmented data

Compared initial thematic categories and agreed that validation theory framed the personal and academic growth students related in their comments about AIMs2 program experiences

Coding scheme with CSUN interview data

Coding scheme with CSUN interview data

Open coding

encouragement
help from students in cohort
seeking help transition from community
college tutoring

acknowledging culture
building confidence
networking + student clubs

emphasis on networking
internship + leadership qualities
research participation + working in groups

Coding scheme with CSUN interview data

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Coding scheme with CSUN interview data

Open coding		*Focused coding*
encouragement help from students in cohort seeking help transition from community college tutoring	→	AISM2 students help each other by providing positive reinforcement and consistent communication
acknowledging culture building confidence networking + student clubs	→	Promotion of cultural organizations and student clubs in engineering and computer science
emphasis on networking internship + leadership qualities research participation + working in groups	→	AIMS2 faculty employ active/peer learning strategies

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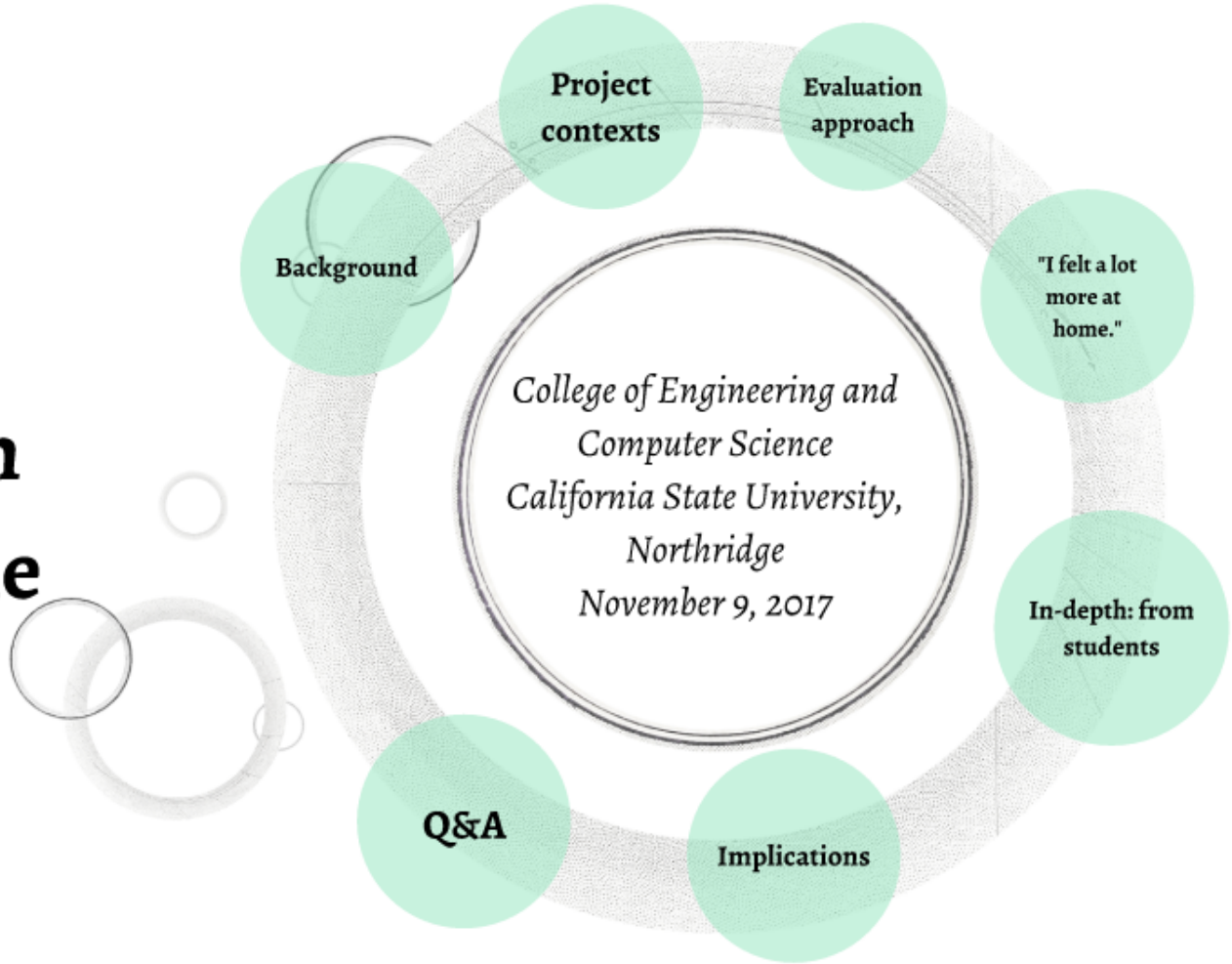
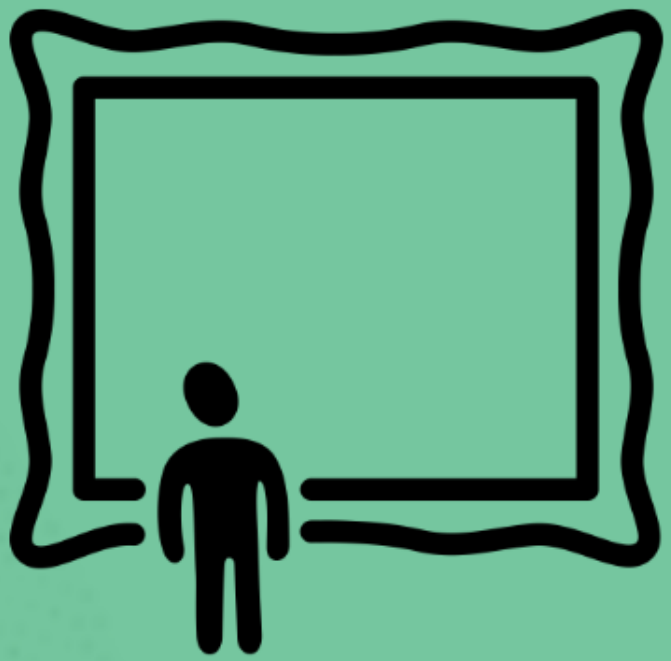



"I felt a lot more at home."
What performance measure data say: "The Big Picture" from quantitati...
Performance measures: numeric data in depth
What students say directly about AIMS2: a preview of textual themes fr...
Fostering a sense of belonging and appreciation
Guiding responses to academic and pre-career challenges
Identifying as a scholar and future engineer

What performance measure data say: "The Big Picture" from quantitative data



Performance measures: numeric data in depth

12 objectives, 35 performance measures

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, mentoring, participating in workshops

Performance measures by the numbers

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All 4 **project measures**—transfer (1a), course articulation (2a/b), and completion (7a) met or exceeded project targets over the course of the 6-year project

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Overall mixed results on ***quantitative* cohort measures** across campuses with many meeting or exceeding targets over the 6-year project period

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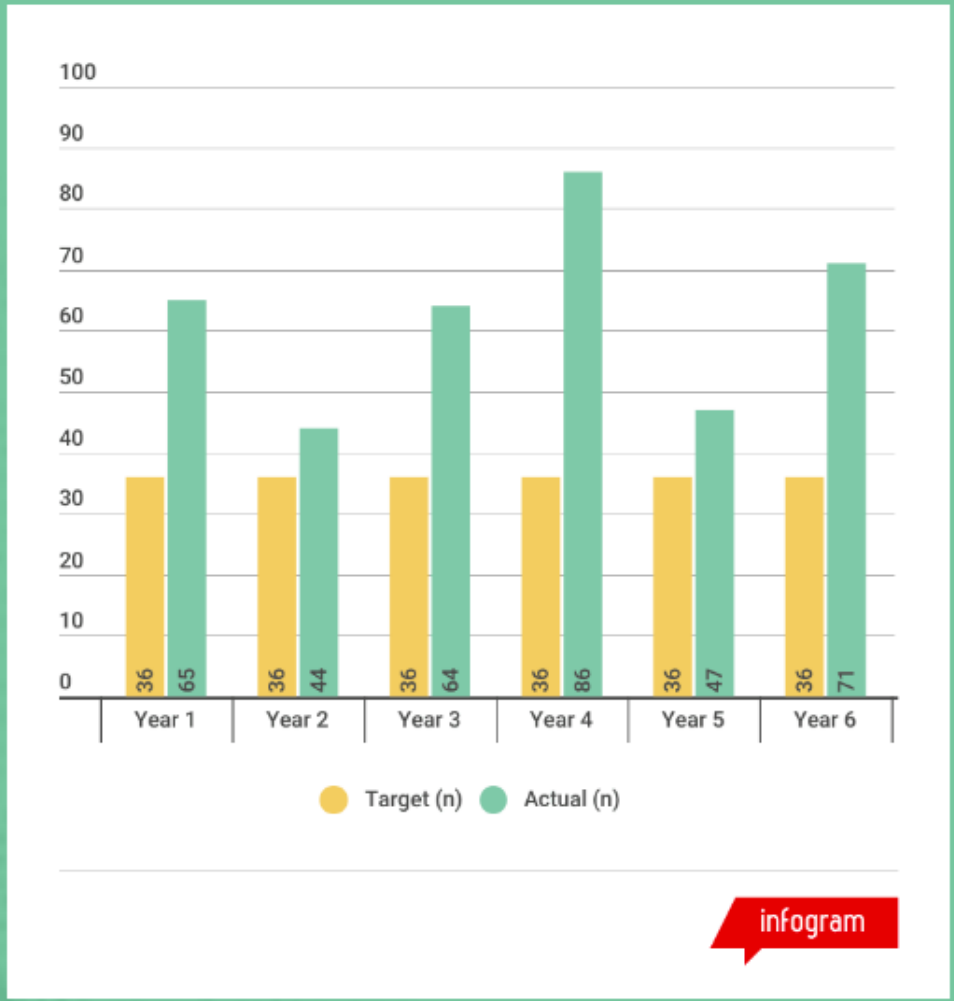
Overall mixed results on ***quantitative* cohort measures** across campuses with many meeting or exceeding targets over the 6-year project period

All ***qualitative* cohort measures** showed improvement in outcomes over the course of the six years of the proejct

Transfer student headcount at CSUN exceeded target over all project years

377 *Hispanic and low-income students transferred from College of the Canyons and Glendale Community College to CSUN during the six-year project!*



CSUN program completion rate generally exceeded target from first to last project year

CSUN program completion rate generally exceeded target from first to last project year

Year	Target n	Target %	Actual n	Actual %
1	21/68	30.9	22/75	29.3
2	21/68	30.9	25/63	39.7
3	21/68	30.9	60/153	39.2
4	21/68	30.9	72/197	36.5
5	21/68	30.9	49/156	31.4
6	21/68	30.9	85/237	35.9

Baseline: 26.5% (18/68)

infogram

Year	Target n	Target %	Actual n	Actual %
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2	21/68	30.9	25/63	39.7
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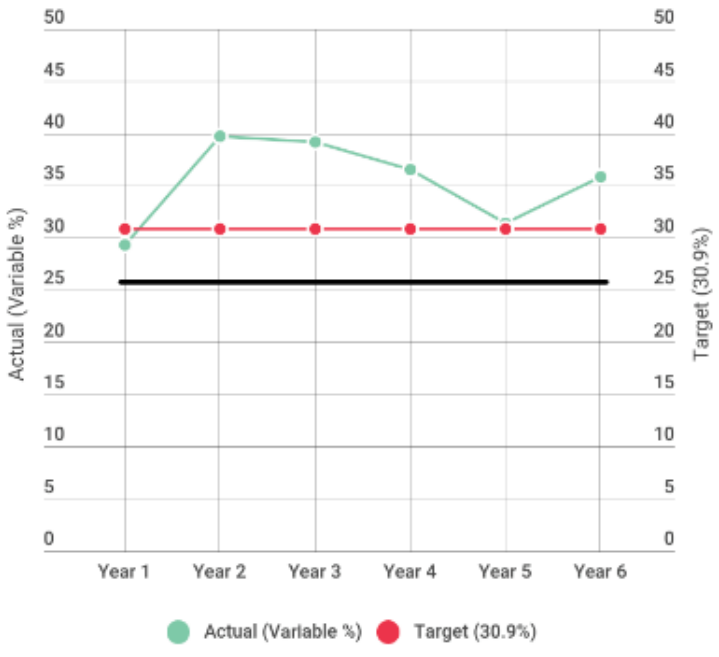

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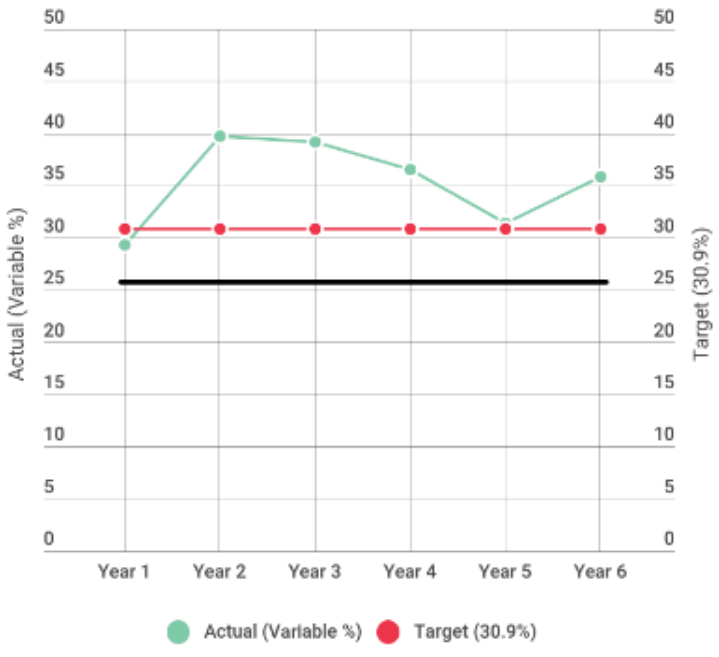

infogram

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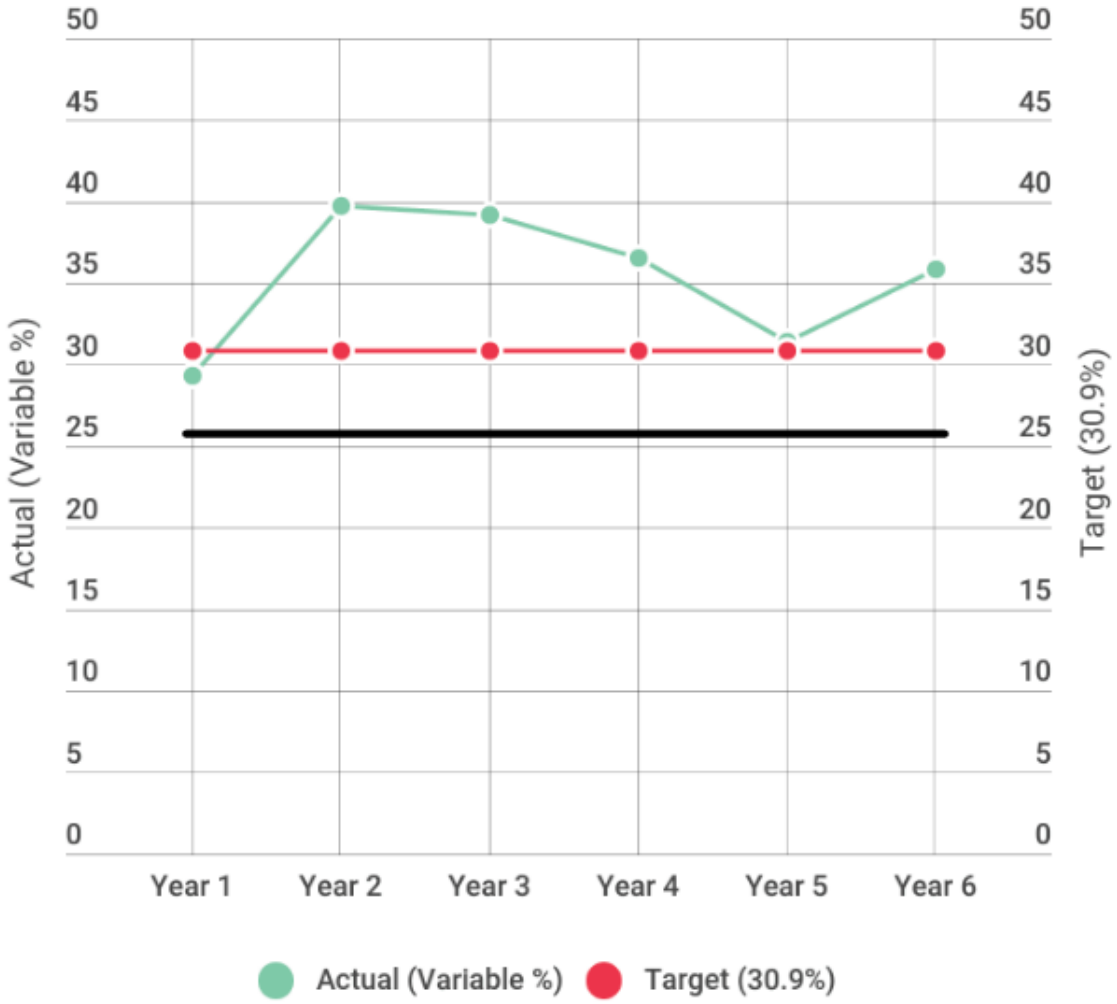
29.3
39.7
39.2
36.5
31.4
35.9

infogram



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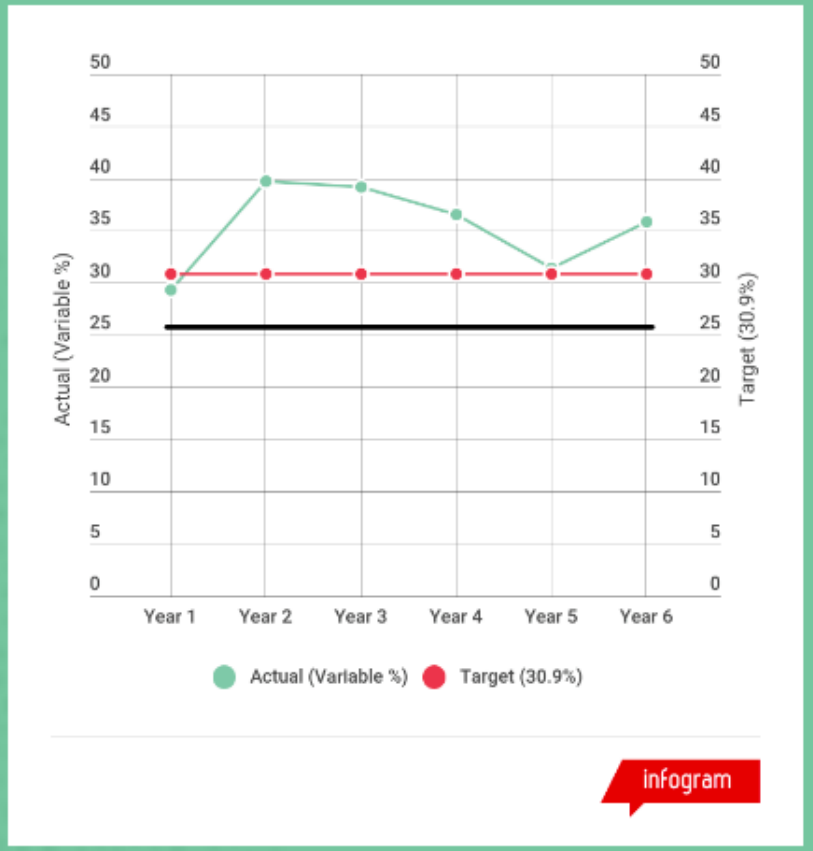

infogram

Course articulation between courses @ CSUN, COC, and GCC

CSUN and COC course articulations (n=6):

CE 240 at CSUN: COC ENGR 152
CMT 110/L at CSUN: COC CONST 103
CMT 208/L at CSUN: COC SURV 101
CMT 210/L at CSUN: COC CONST 106
MSE 227 and 227/L at CSUN: COC ENGR 151L
ME 186/L at CSUN: COC ENGR 114

CSUN and GCC course articulations (n=10):

CE 240 at CSUN: GCC ENGR 152
CIT 101/L at CSUN: GCC CSIS 101 or CSIS 194
CIT 160/L at CSUN: GCC CSIS 260
CM 110/L at CSUN: GCC ARCH 102
COMP 108 at CSUN: GCC CSIS 112
COMP 122/L at CSUN: GCC CSIS 165
COMP 256/L at CSUN: GCC CSIS 125
ECE 240/L at CSUN: GCC ENGR 240
ME 209 at CSUN: GCC ENGR 156
ME 186/L at CSUN: GCC ENGR 111

Course articulation between courses @ CSUN, COC, and GCC

Exceeded project target of 15 new course articulations by 1 course, with a total of 16 new articulated courses!

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COC and GCC Counselor STEM PD + academic advising

COC and GCC Counselor STEM PD + academic advising

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
COC Counselors Who Participated in STEM PD (n)	2	2	2	2	2	2
GCC Counselors Who Participated in STEM PD (n)	3	3	3	4	2	No data

infogram

STEM PD with counselors met or exceeded target!

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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infogram

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infogram

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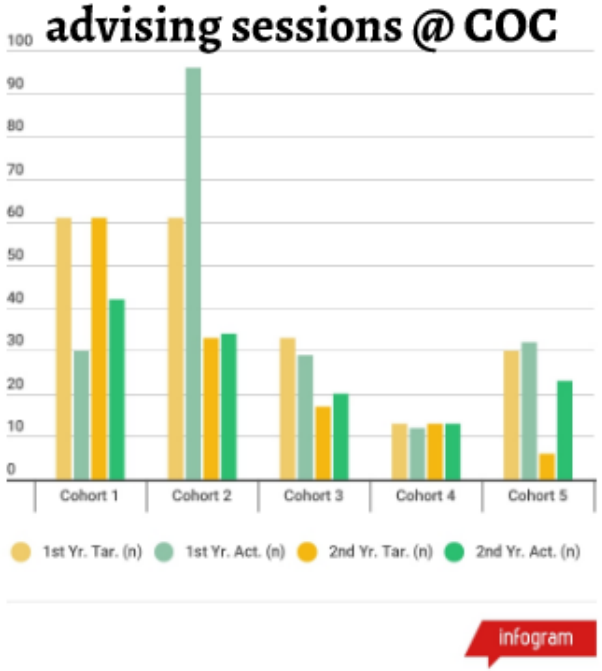
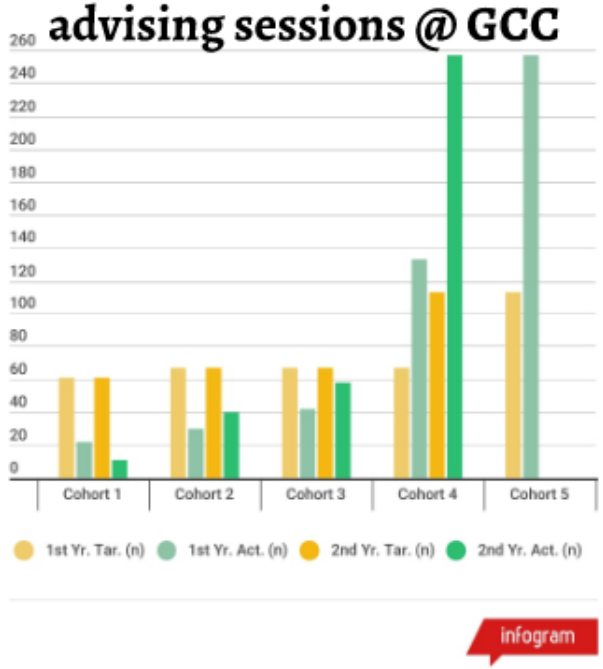
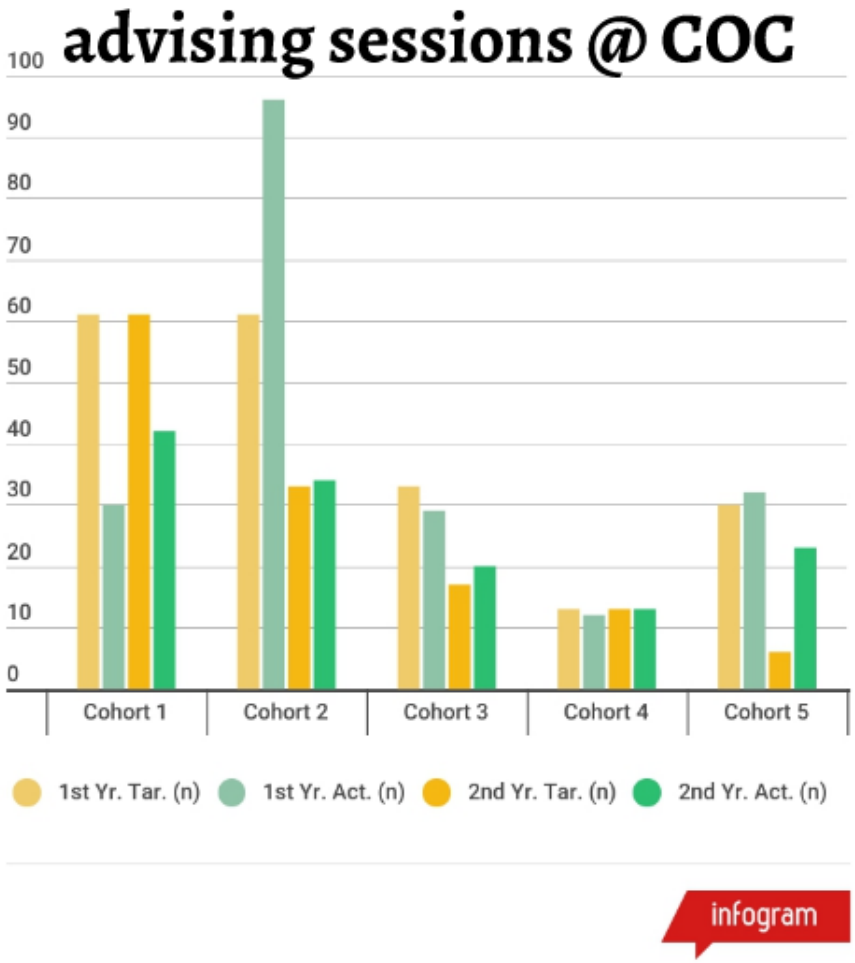
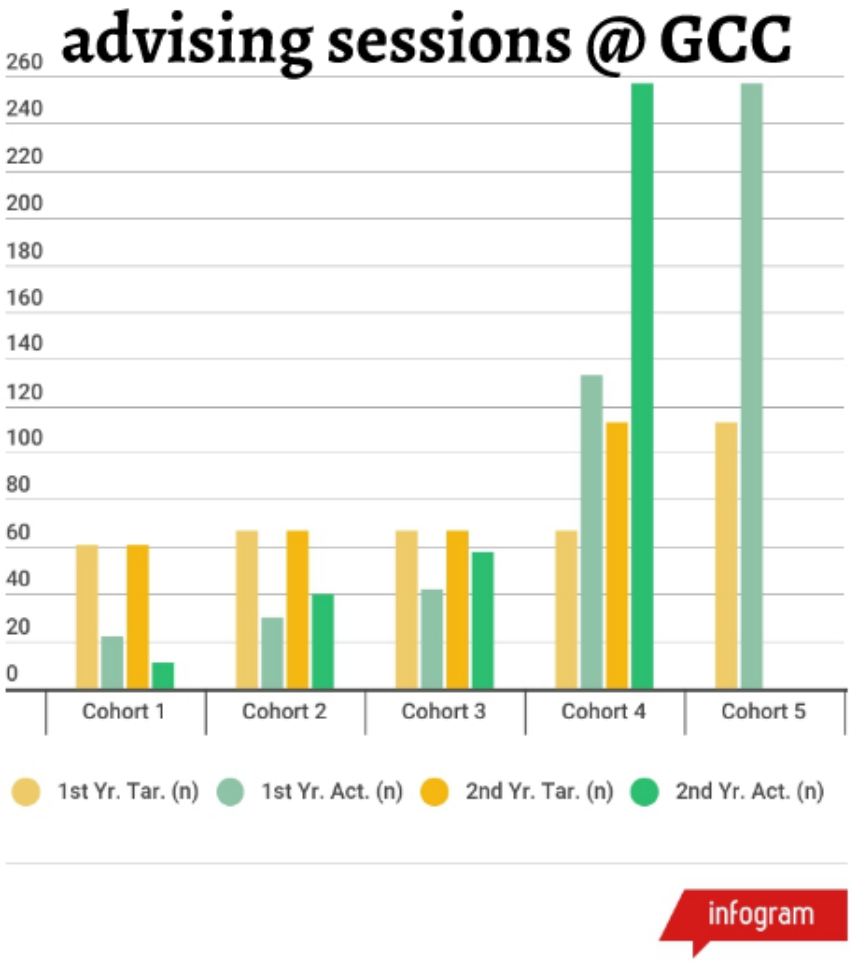




Academic advising sessions with students generally met or exceeded targets!


advising sessions @ COC
100
90
80
70
60
50
40
30
20
10
0
Cohort 1
Cohort 2
Cohort 3
Cohort 4
Cohort 5
1st Yr. Tar. (n)
1st Yr. Act. (n)
2nd Yr. Tar. (n)
2nd Yr. Act. (n)
infogram


advising sessions @ GCC
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Cohort 1
Cohort 2
Cohort 3
Cohort 4
Cohort 5
1st Yr. Tar. (n)
1st Yr. Act. (n)
2nd Yr. Tar. (n)
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infogram

COC and GCC Counselor STEM PD + academic advising

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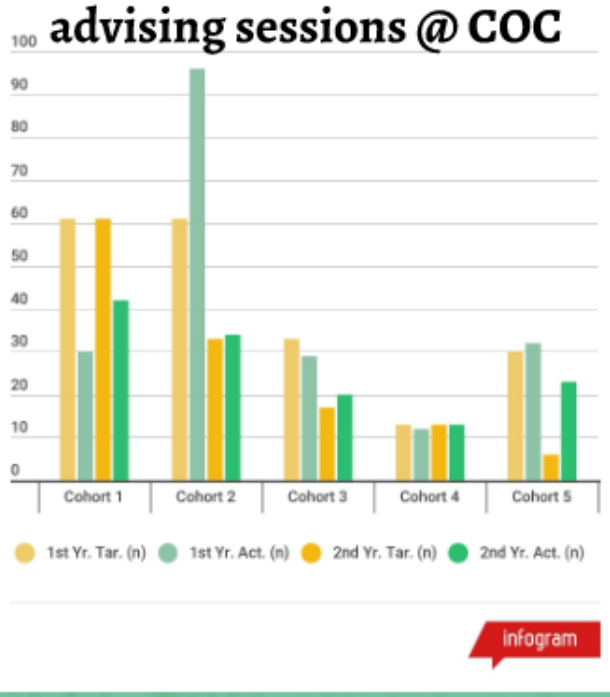
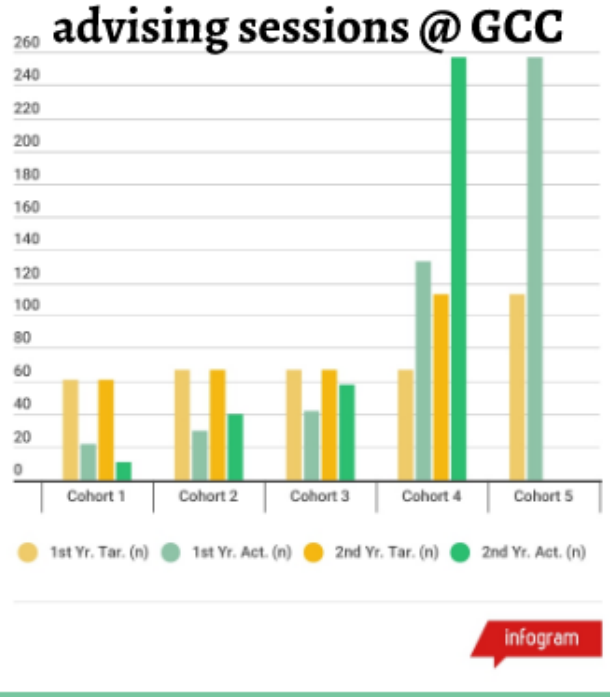
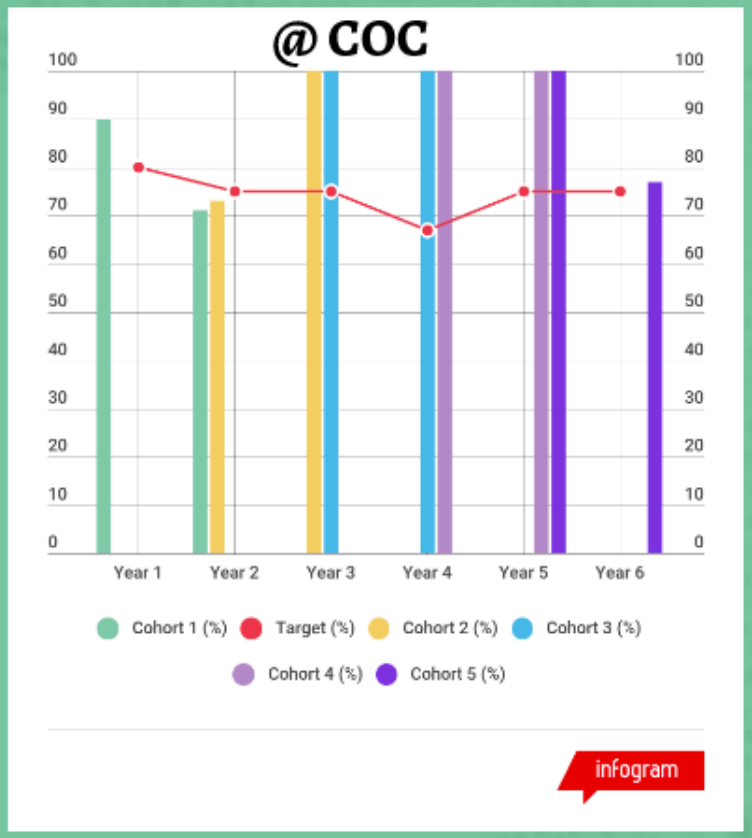
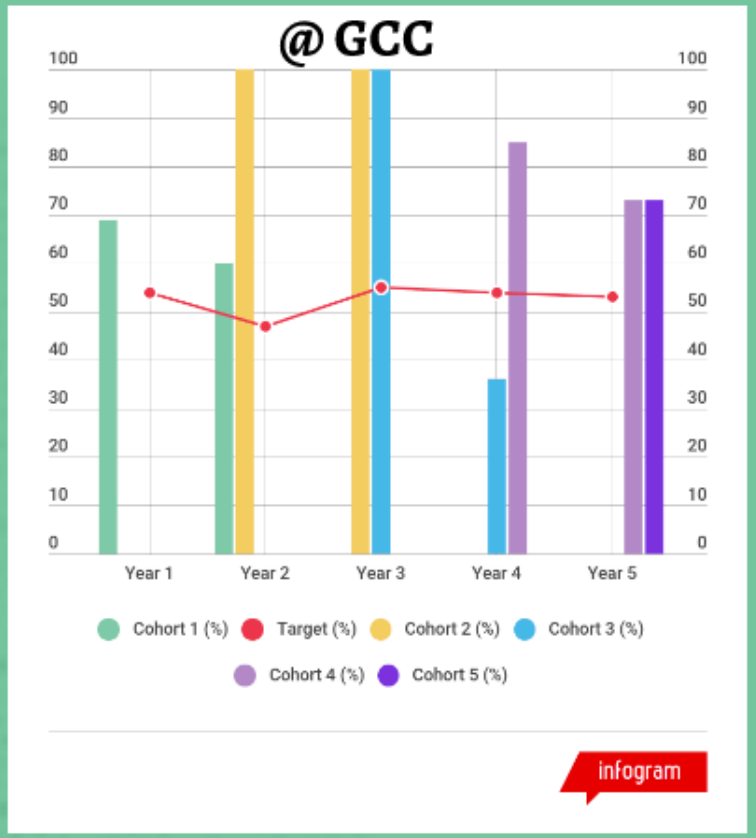




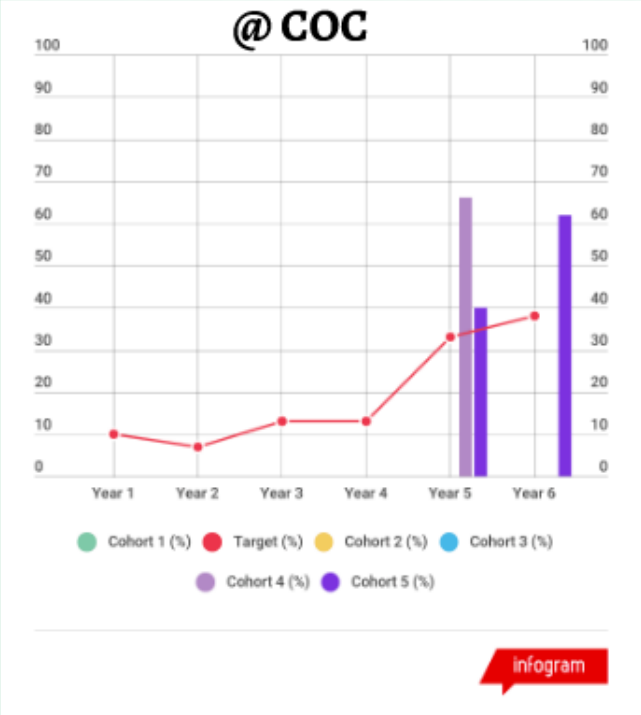
Academic advising sessions with students generally met or exceeded targets!

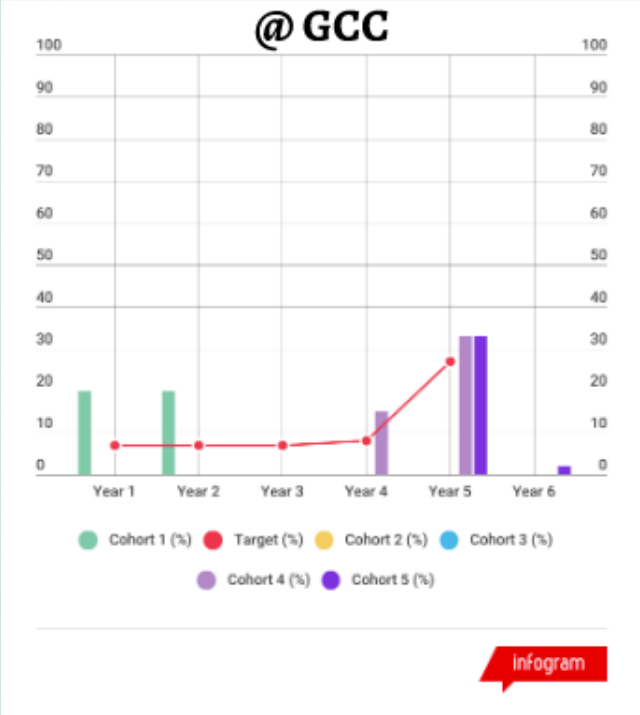
Participation in tutoring sessions @ COC and GCC





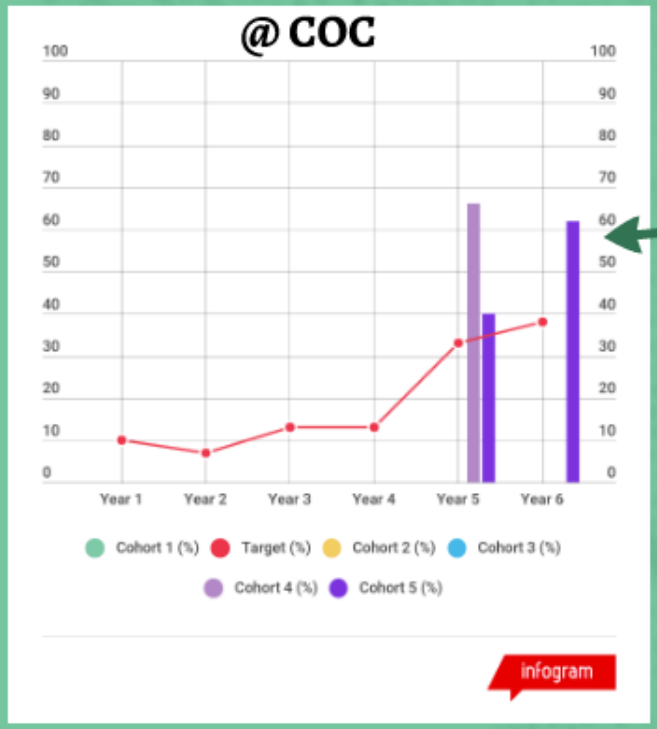
Online course enrollment @ COC and GCC

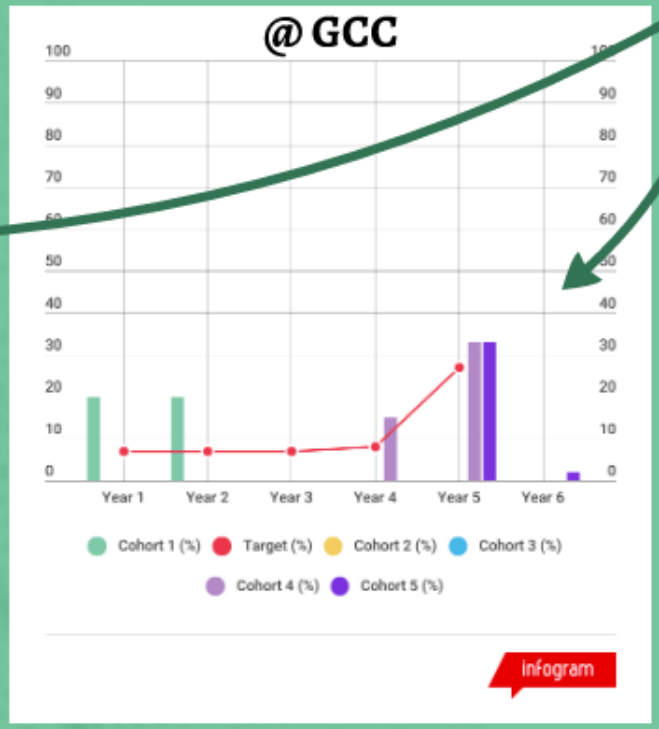




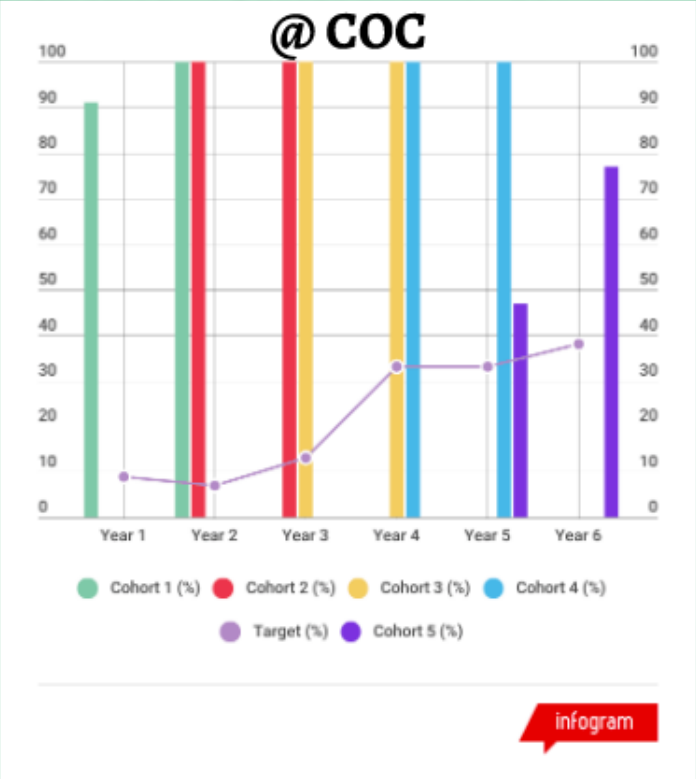
Online course enrollment @ COC and GCC

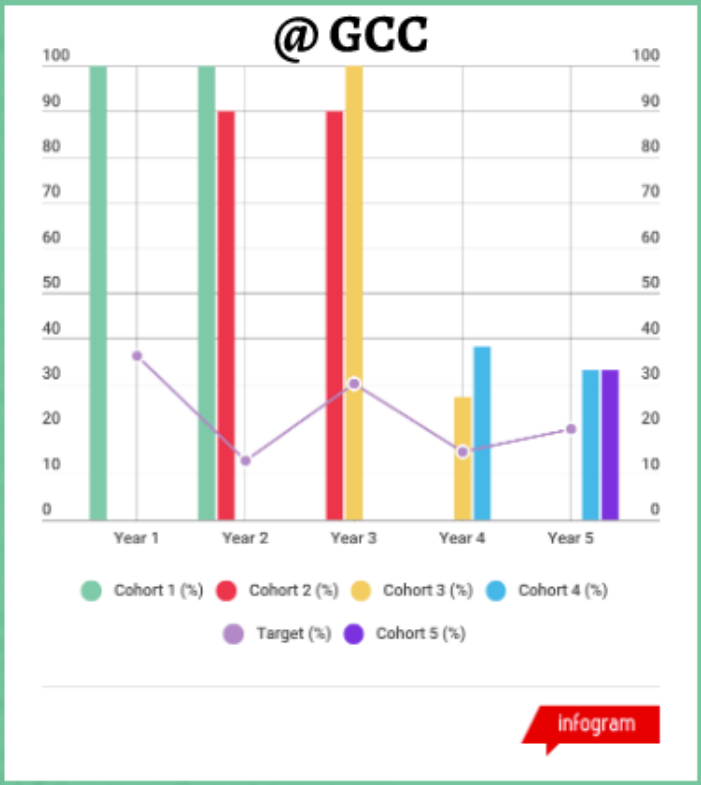
Revised performance measure to include enrollment in an online course at any college or university!



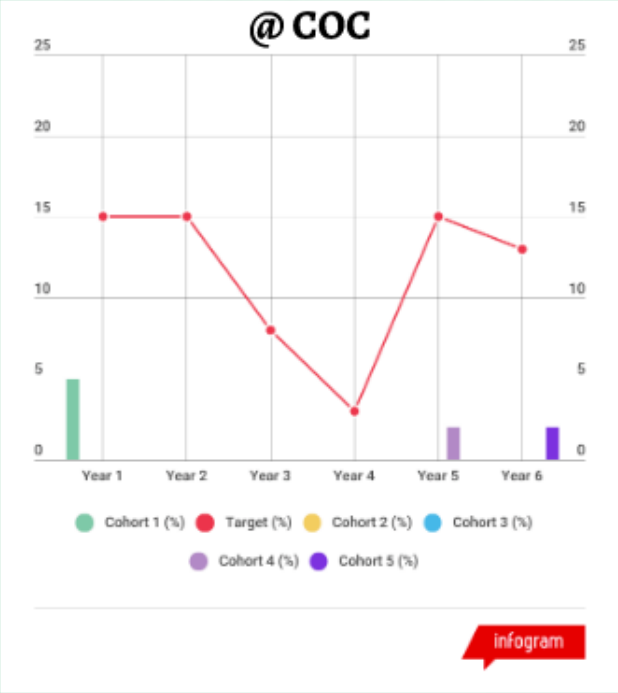


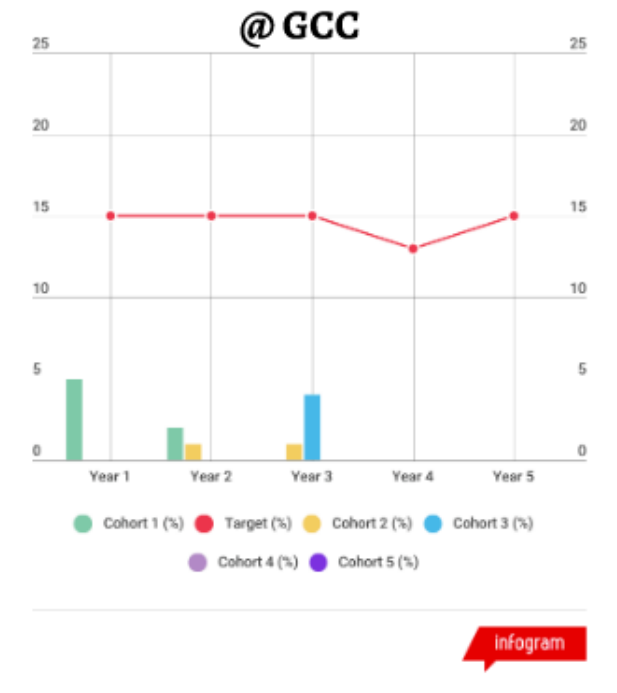
Student-faculty interaction @ COC and GCC





COC and GCC students peer mentored by CSUN students

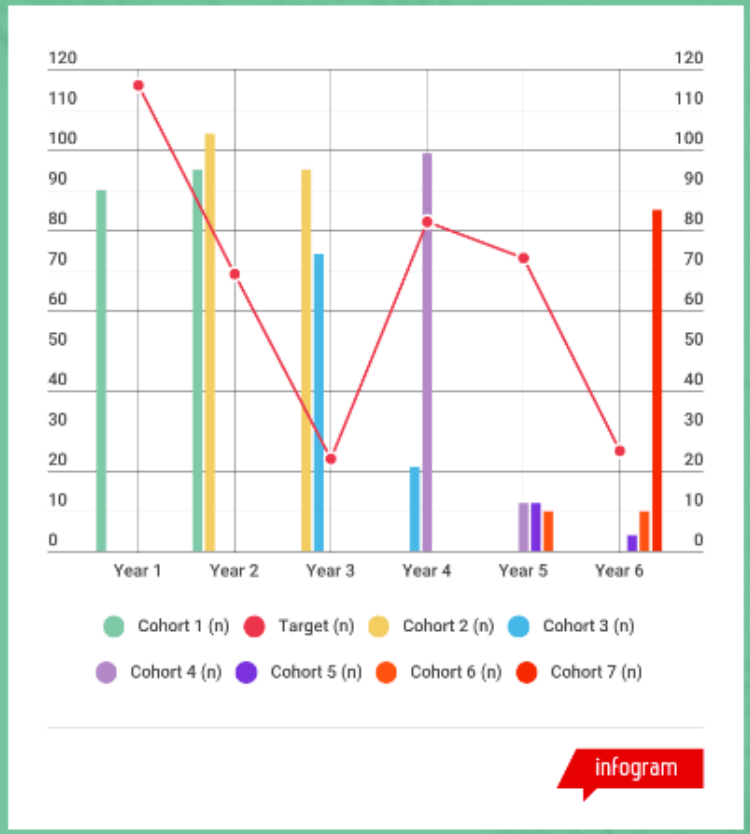




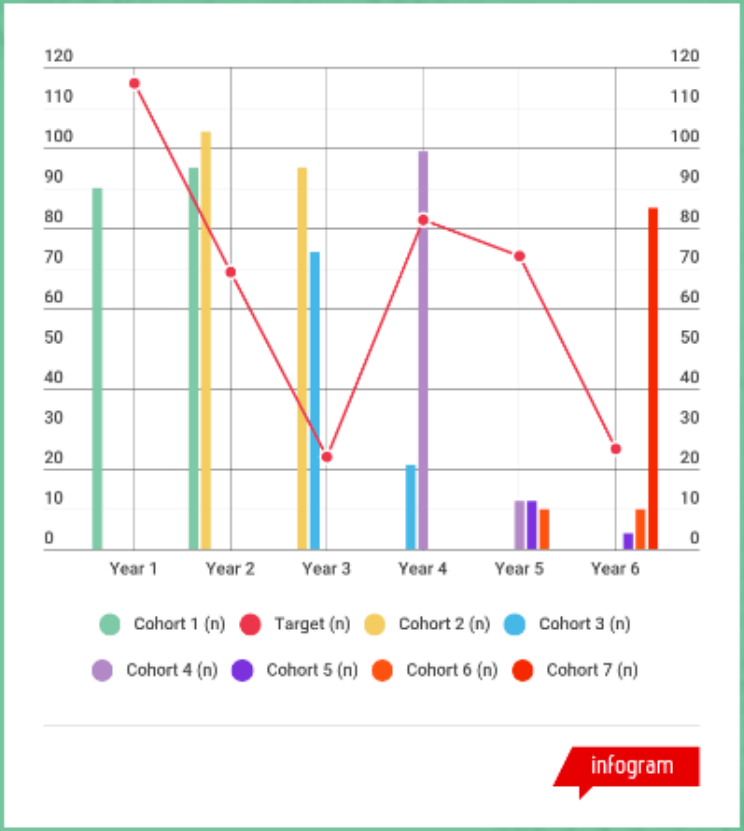
Academic advisors @ CSUN

Met target of FOUR new academic advisors at CSUN over the six-year project period!

Academic advising sessions @ CSUN



Academic advising sessions @ CSUN

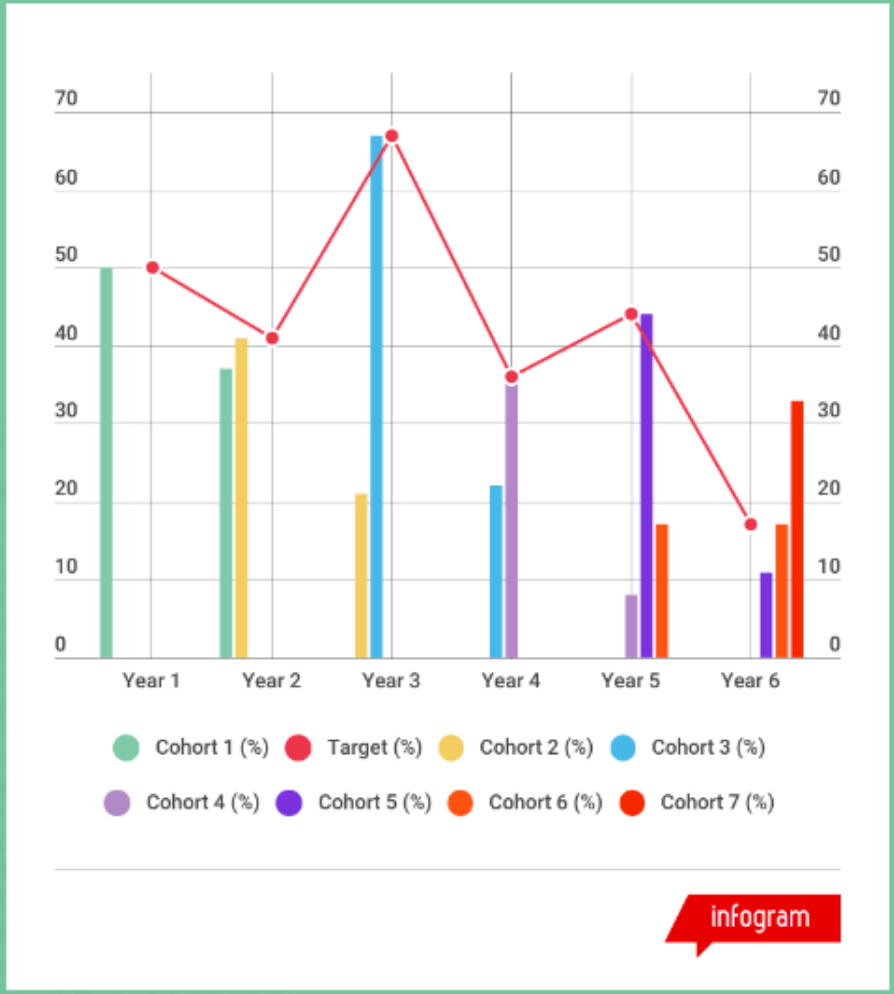


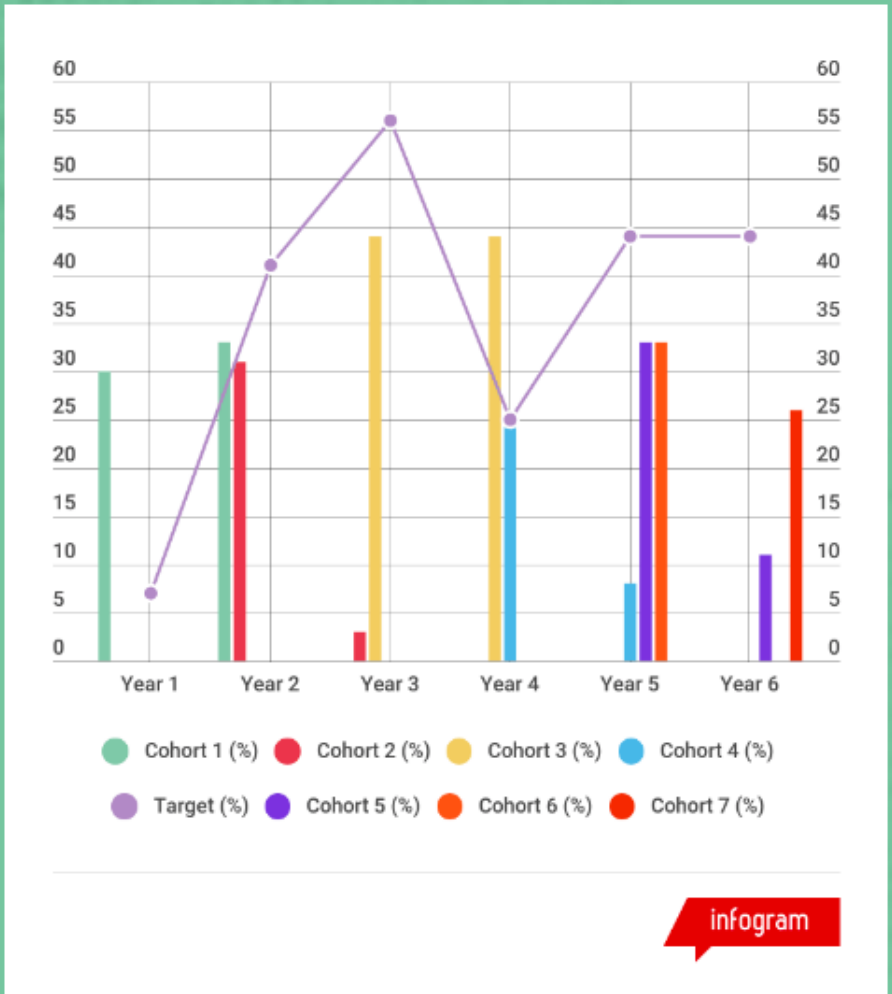
*Number of advising sessions generally **exceeded** targets over six-year project period with a total number of sessions reaching 711 (715 target)!*

Exceptions where advising sessions dipped:

- *Cohort 1: project start, early implementation of activities*
- *Cohort 5: generally lower structured journal completion rates*
- *Generally lower participation in advising sessions in 2nd year of cohort*

Participation in academic workshops @ CSUN



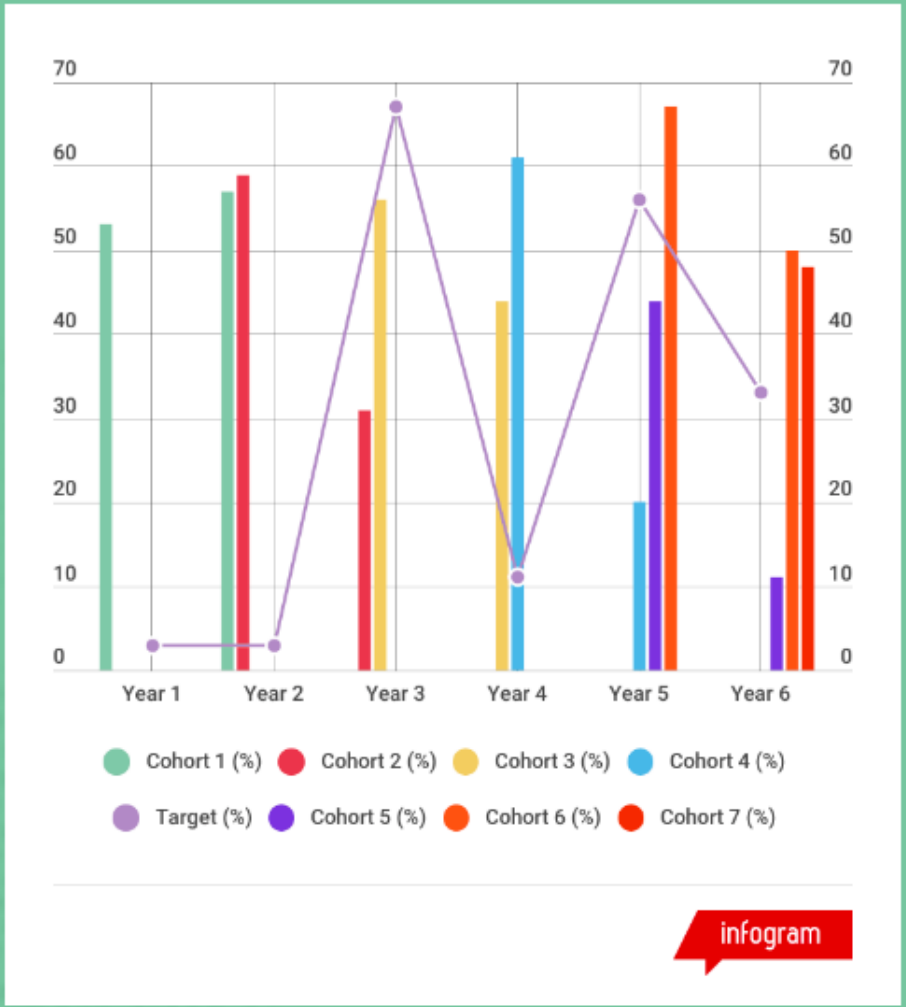


Participation in supplemental lab sessions @ CSUN

Research participation with faculty @ CSUN

Generally met or exceeded target!

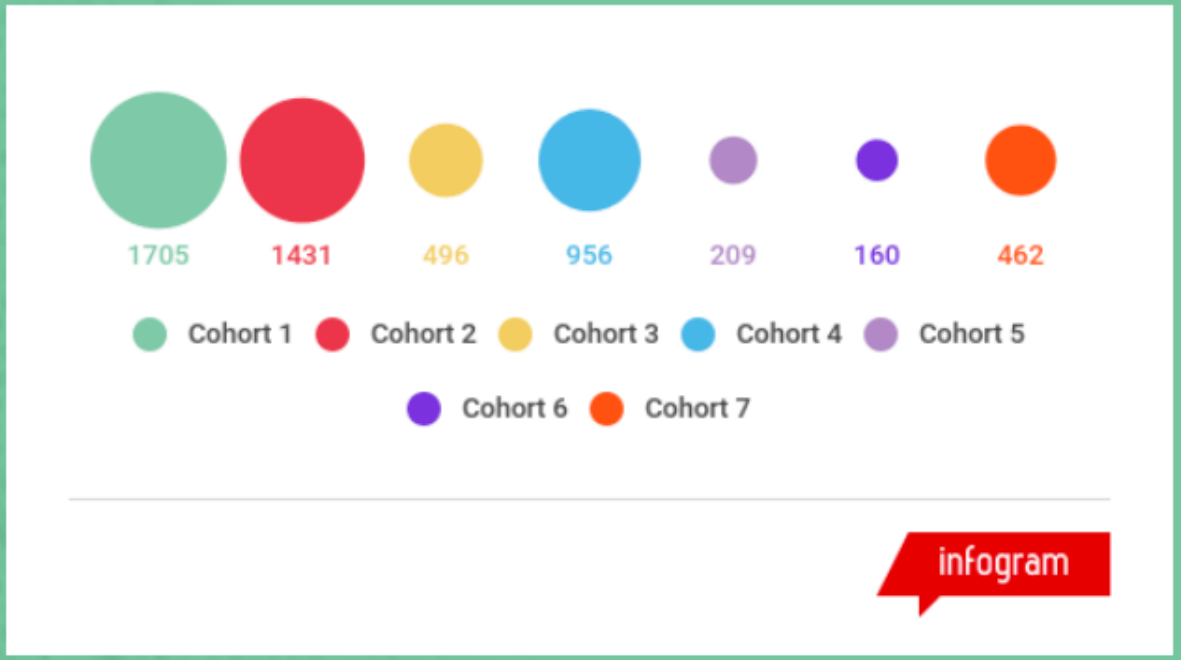
Strong student involvement in faculty research in all years with 1st, 2nd, 4th, and 6th years exceeding target!



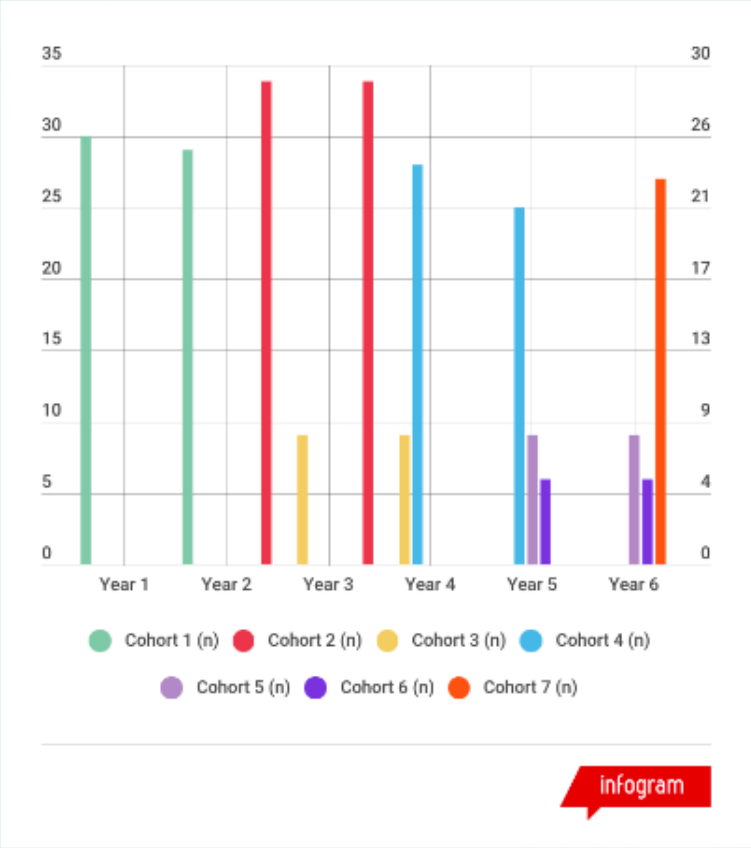
Student-faculty interaction @ CSUN

Number of contacts between AIMS2 students and faculty mentors generally related to cohort size!

Across cohorts, student-faculty contacts frequently exceeded targets!

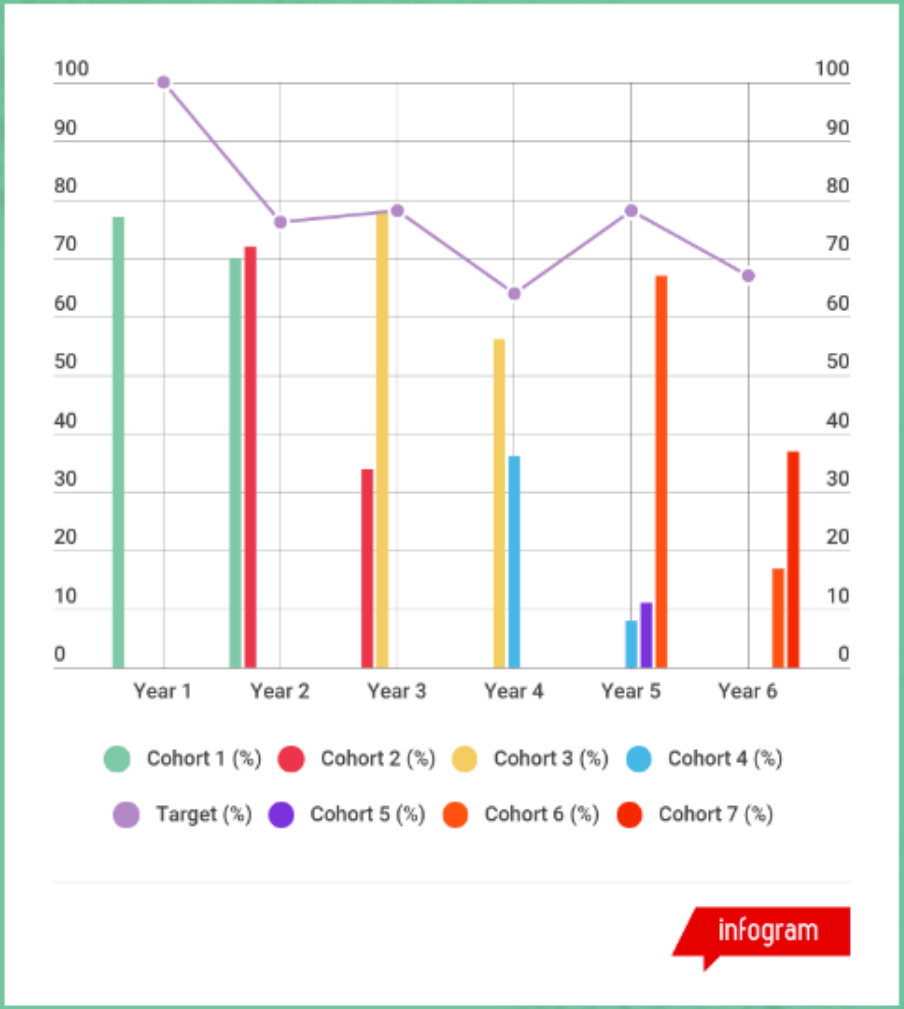


Peer cohort participation @ CSUN



Changes to student headcount in cohorts over six-year project period:

Cohort 1: **30** (Year 1) **29** (Year 2)
Cohort 2: **29** (Year 2) **29** (Year 3)
Cohort 3: **9** (Year 3) **9** (Year 4)
Cohort 4: **28** (Year 4) **25** (Year 5)
Cohort 5: **9** (Year 5) **9** (Year 6)
Cohort 6: **6** (Year 5) **6** (Year 6)
Cohort 7: **27** (Year 6)



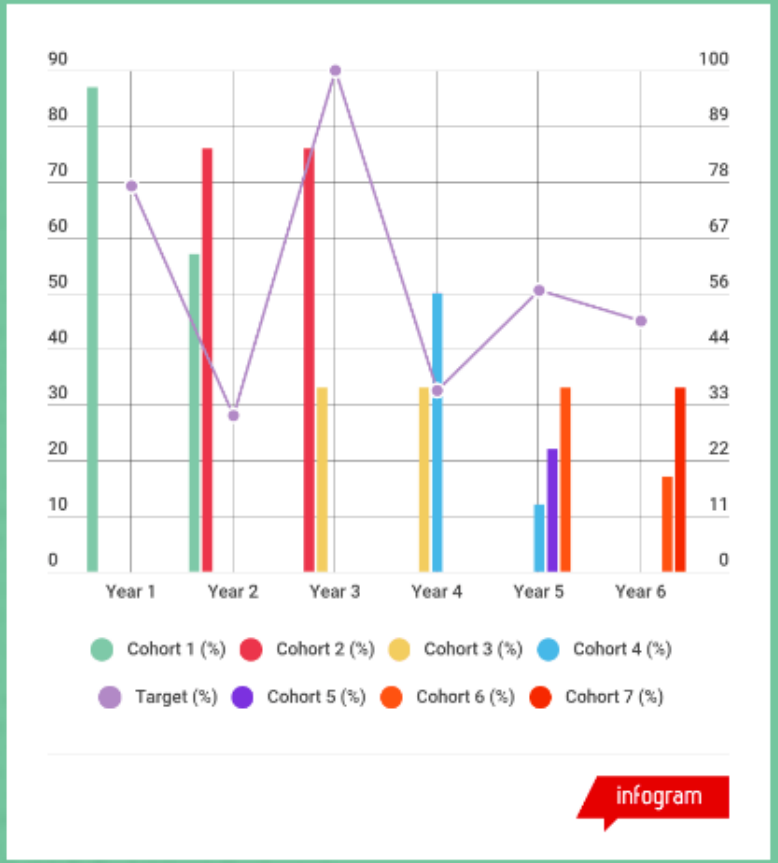
Peer tutoring participation @ CSUN

Across cohorts, performance measure data generally fell below targets during the project!

Peer mentoring participation @ CSUN

Over the six-year project period, performance data reveal mixed patterns of participation in peer-peer mentoring!

Early proejct years--1st to 4th--witnessed higher rates of participation in peer mentoring, while later project years saw declines!



What students say directly about AIMS2:

a preview of textual themes from qualitative data/interviews

Fostering a sense of belonging and appreciation

Fostering a sense of belonging and appreciation

"I feel like AIMS2 has bridged and created the connections between us—otherwise we would just be a bunch of random people who happened to be taking similar classes."

Guiding responses to academic and pre-career challenges

Guiding responses to academic and pre-career challenges

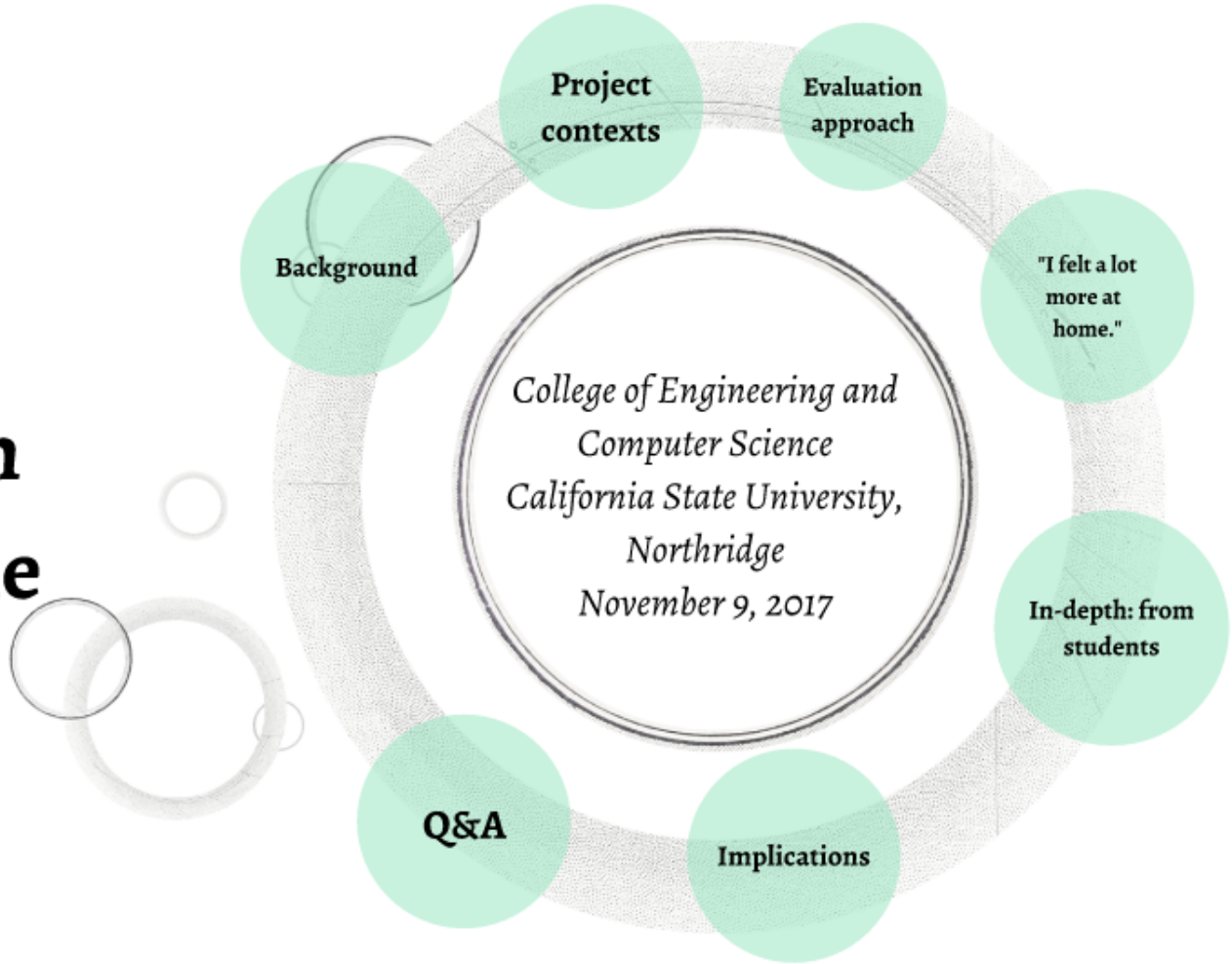
"The stuff we talk about [in AIMS2] is more stimulating. We can say, 'Here is what we learned and here is what we can do to make it better.' I kind of like that conversation."

Identifying as a scholar and future engineer

Identifying as a scholar and future engineer

"Here it feels like we're just building a network so when we get out into the real world you might have a chance to interact with them again, maybe from different companies."

Final Performance Report: Findings from Years 1-6 of the 2011 AIMS2 Project



In-depth: from students

How we made sense of textual data from AIMS2 students at CSUN

Sense of belonging and appreciation

Academic and career guidance

Scholarly and professional identity

Fostering a sense of belonging and appreciation

Guiding responses to academic and pre-career challenges

Identifying as a scholar and future engineer

Fostering a sense of belonging and appreciation

Of the 14 AIMS2 students whom we interviewed, 12 described **feeling like they belonged with students and faculty in engineering and computer science fields** since joining the Connect program

While increased time on campus may have explained part of interviewees' sense of belonging, what was equally vital is that these students *consistently interacted with peers who shared their academic and career interests in engineering and computer science and their cultural norms, values, and beliefs*

AIMS2 student participants: post-transfer transition

"I feel like AIMS2 has **bridged** and **created the connections** between us—otherwise we would just be a bunch of random people who happened to be taking similar classes."

AIMS2 student participants: post-transfer transition

"I feel like AIMS2 has **bridged** and **created the connections** between us—otherwise we would just be a bunch of random people who happened to be taking similar classes."

"When I first got here, I felt like I kind of had to go out and meet people and make friends. Here in AIMS2 it was like **you already have people**; it's easier for you to make friends. **I know their names**. It's easier to talk to them and talk about some troubles that you're having."

AIMS2 student participants: post-transfer transition

On AIMS2 peers...from student participants

On AIMS2 peers...from student participants

"These peers made me feel in a way fortunate to have someone that **you already know**. So I did feel fortunate to have someone kind of **guide me** through during my first couple of days at CSUN. So for me, I thought this was kind of cool that I was fortunate that **I had people who I could text and someone who can stick around and help me with the homework**."

On AIMS2 peers...from student participants

"These peers made me feel in a way fortunate to have someone that **you already know**. So I did feel fortunate to have someone kind of **guide me** through during my first couple of days at CSUN. So for me, I thought this was kind of cool that I was fortunate that **I had people who I could text and someone who can stick around and help me with the homework**."

"Now **I feel more at home** because everybody is in the same place as me. Like we are all new to this kind of thing, so it feels good."

One student's perspective

"I would go see my tutor and he would always help me a lot. I think a lot of people go to the professors, but ***I feel way more comfortable asking a student****. It's different because it's a student —you're not talking to a teacher. We talk about different things. When you go to a professor you just ask him a question and that's it. It might be awkward in some situations.* ***With the tutor, you can be there for hours just talking about other stuff and then go back to the material.*** *"*

From AIMS2 faculty mentors

From AIMS2 faculty mentors

"They have created a great **environment of collaboration.**"

From AIMS2 faculty mentors

"They have created a great **environment of collaboration**."

"As a group the cohort is **bonding and com[m]unicating** amongst themselves to help each other."

A student's story on feeling at home...

"I go to SHPE and it's nice. I've also been to HENAAC [Hispanic Engineer National Achievement Awards Conference]. **It's a whole Hispanic thing and that's fun**. There's Puerto Ricans there and everyone is Hispanic. I'm an American, but I also grew up in a Colombian-American household. **So when I went to the conference, I felt a lot more at home.**"

Guiding responses to academic and pre-career challenges

All student participants described having some sort of invalidating educational experiences before joining AIMS2.

What students said about feeling invalidated

"For me, it's hard. I've never been a good student my whole life"

"I thought college was going to be hard, that I wasn't really able to do it."

"I never thought I was going to go to college" and "I just wasn't motivated"

"When I took my first programming class I was like, 'No I can't do this'"

"I didn't feel there was anything in my life that could have helped me get to a community college"

"I always held in the back of my mind that if I didn't succeed in this major it was probably because of the math."

AIMS2 reshaped student experiences

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For the majority of the student participants, their peers in AIMS2 were **a source of encouragement and inspiration about engineering or computer science**

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"The stuff we talk about [in AIMS2] is more stimulating. We can say, '**Here is what we learned and here is what we can do to make it better.**' I kind of like that **conversation**."

AIMS2 faculty roles with students

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"I feel like being part of AIMS2 and just having someone check in on you to see if you're passing your classes, **willing to help you out with anything**, has definitely pushed me to keep trying harder in my classes."

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"I ask my faculty advisor questions about his [side work]. *He wouldn't really tell me much. That's another thing about engineering that I think is cool. It's like a secret."*

Peer influence in reshaping experiences

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"It helps a lot. **I think it helps encourage me to try harder and keep coming**. It does help me what they did. It helps me want to go there and be around those people and go to my classes and do everything that I can so I can try to get my degree."

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"She is really smart. She got an internship at a top engineering company. ***She said I could do it, too, as long I tried."***

What AIMS2 faculty shared...

*"All these students are very **motivated**, **eager to contribute** to this program, hopefully next year they will be involved as volunteers and speakers at local schools and community colleges for this program."*

Identifying as a scholar and future engineer

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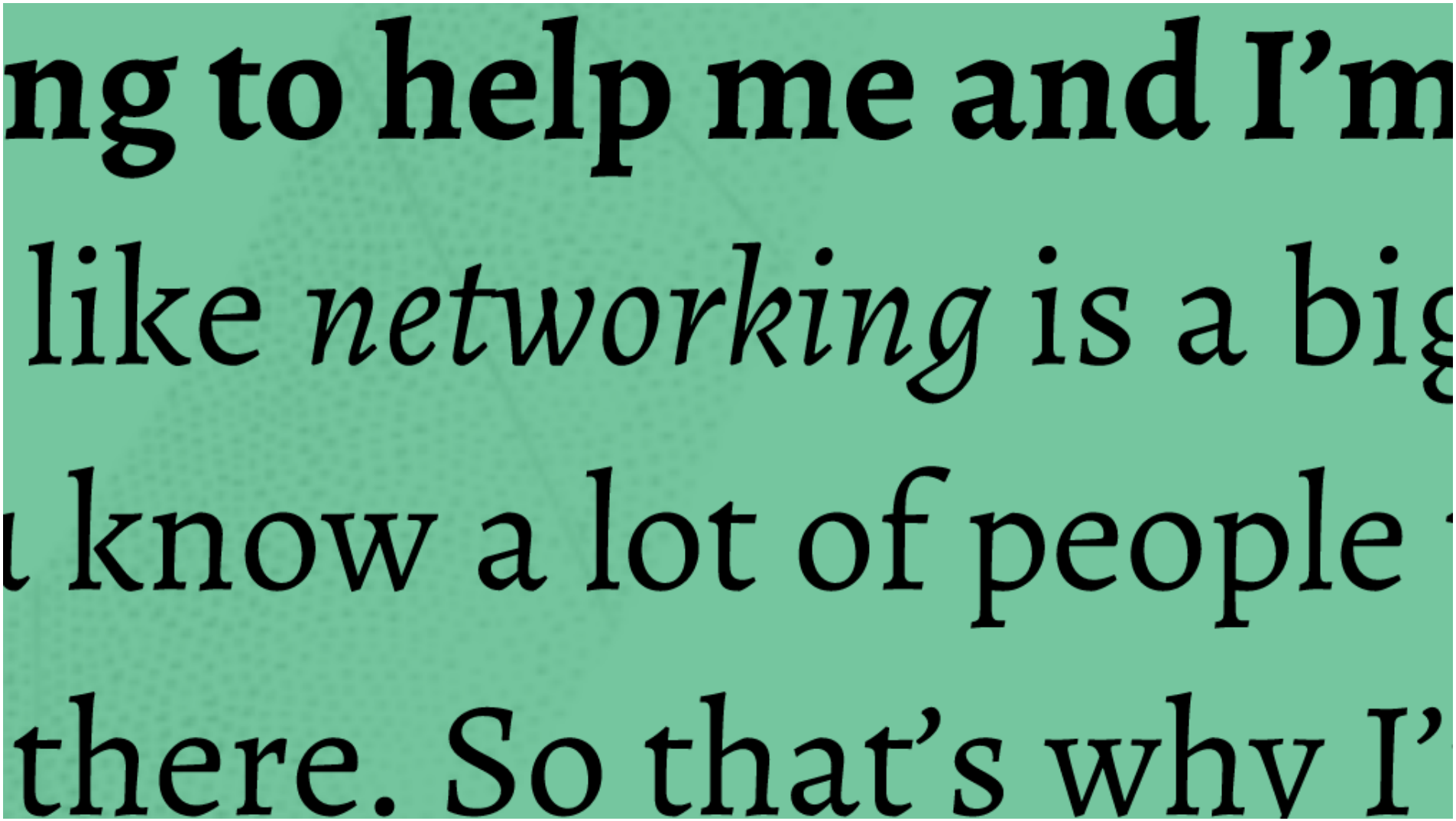
AIMS2student stories about transitioning to the workforce shared among peers appeared *to boost participants' confidence that their own job prospects were favorable*

What one AIMS2 student recounted...

"The friends that transferred from the same community college, I feel like they're always going to be there for me, especially when I graduate. I'll be looking for a job. **I do feel like they're always going to be there to help me like to get internships and stuff.** As far as people I've met at CSUN, **I do feel that they are also willing to help me and I'm willing to help them too if I were to get a job**. I do feel like *networking* is a big part of your success after graduating because when you know a lot of people that work at different places they can help you get a job there. So that's why I'm trying to expand my network here at CSUN. "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Another AIMS2 student story...

"My faculty advisor gives us the freedom **to work on the projects we do in the club**. An example of that would be every semester that I've been part of the AIMS2 program we really don't have an agenda or anything specific to work on—we just kind of have some rules and things that we lay out for each other to help us keep learning every way we can. From that, we pretty much come up with projects we want to work on every semester and because she gives us the freedom to pick the project that we want to work on no matter how difficult it might seem, if we get stuck she'll bring in either former students or people in the field to give us a little bit of help. **And because she gives us so much freedom I think that's where we just get the confidence.**"

An AIMS2 student's response...

"Computer science majors might say, 'I'll just be in front of a computer for 16 hours a day.' But eventually you got to contact somebody. Especially for the interviews, right? **Even though you're in a major full of introverts, you have to get it in your mind that if you can talk to people at whatever level it makes the entire process a lot easier.** For example, when you're being interviewed by people in business, it's good to be able to go to their level and basically make a connection."

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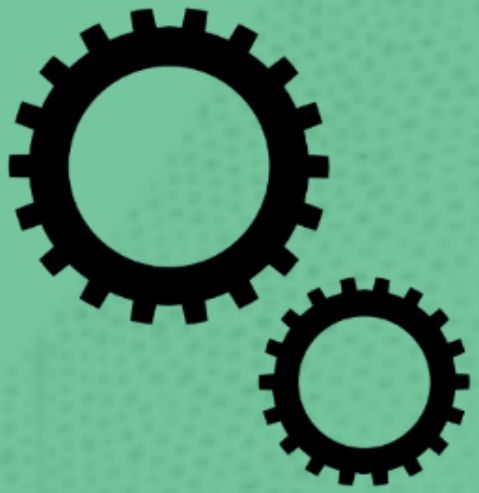
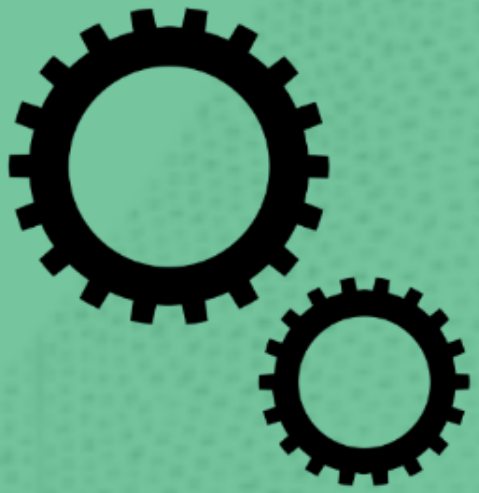
AIMS2 faculty mentor stories



AIMS2 faculty mentor stories

"So, we have developed a routine. I write the theory on the board, the students use One Note to take notes on their laptops, then they do the work and send me copies of their One Note files on a weekly basis. This works great."



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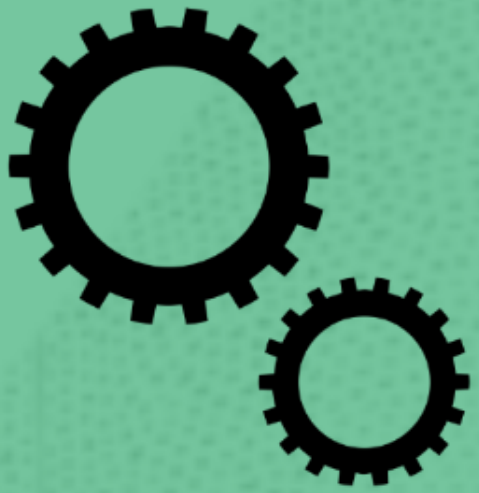

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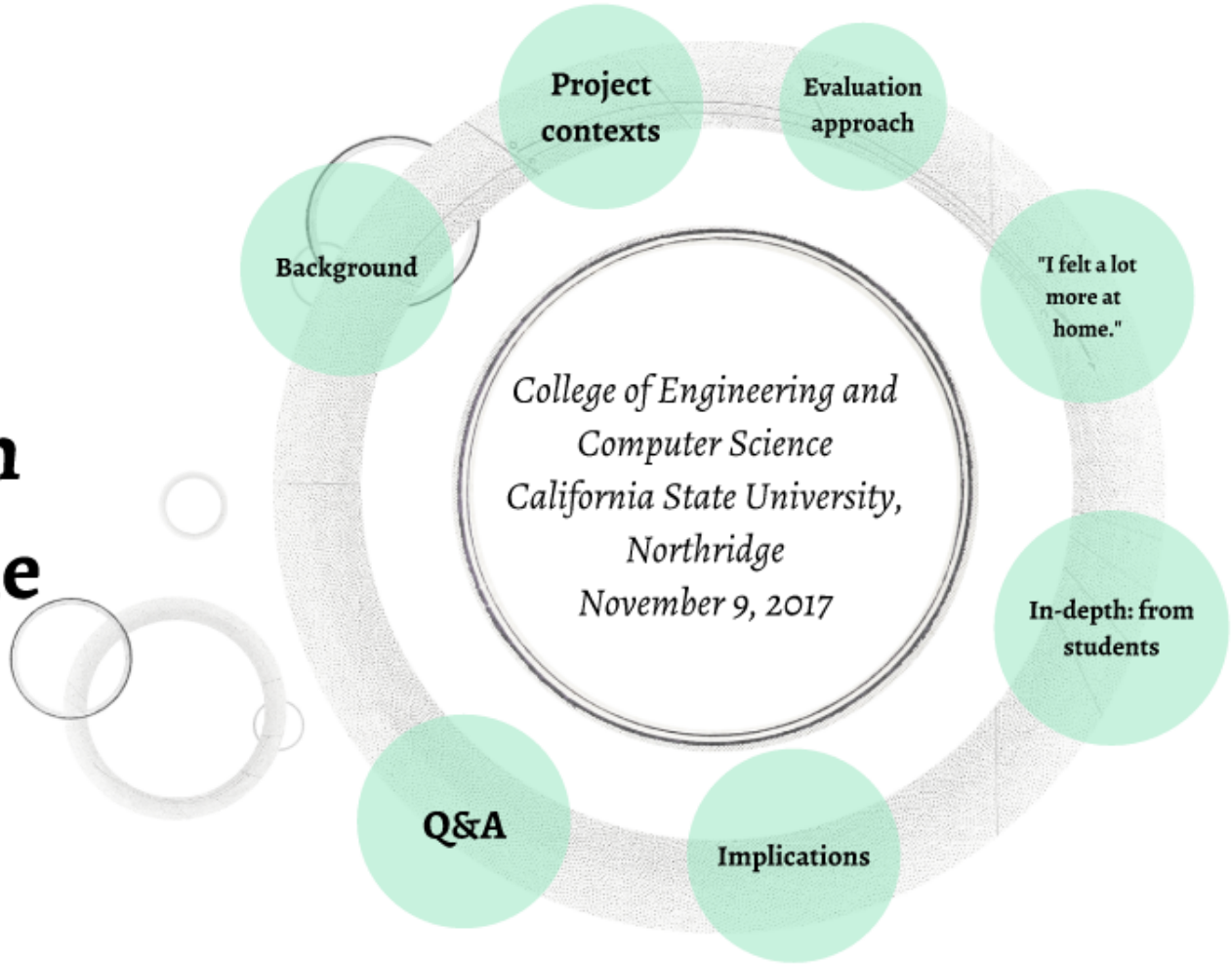
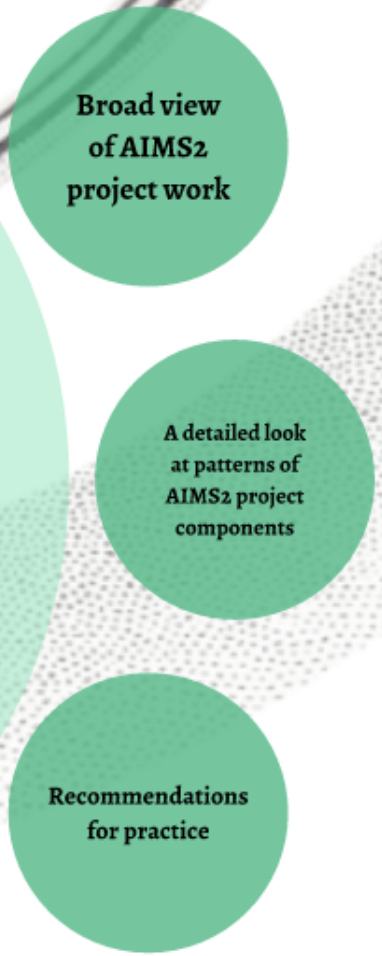
"The focus of research is on creating PowerPoint presentations to showcase their projects in November at the ASM meeting. Important for these presentations is the students' ability to clearly convey technical information in a relatively interesting and organized manner. Worked with three students to make sure they would be ready to give their presentations at ASM/ SAMPE meeting."

Final Performance Report: Findings from Years 1-6 of the 2011 AIMS2 Project



Implications

Understanding results and extending findings of quantitative and qualitative data analysis to AIMS2 project work



Broad view of AIMS2 project work

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STEM counselor PD + academic advisors + faculty mentors

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Room for improvement:
Peer mentoring @ CSUN and CSUN-GCC-COC + peer tutoring + online course enrollment + 2nd-year participation in project activities

A detailed look at patterns of AIMS2 project components

Academic and interpersonal validation

Academically *and* **interpersonally** ***validating experiences*** *in AIMS2*

Pedagogical/cultural components in campus life = Rendón (1994): shape students experiences

In **AIMS2** program contexts at GCC, COC, and CSUN

A cohort-based approach that structured student-faculty and peer-peer interaction among students who shared similar cultural experiences, beliefs, and norms

Validating system where AIMS2 students could see each other as successful engineering and computer science students

AIMS2 faculty mentor meetings

Weekly AIMS2 faculty mentor meetings with students @ GCC, COC, and CSUN served as a primary mechanism to structure faculty-student and peer-peer interaction

focused on research and internship work, participation in student organizations, presentations at conferences—all of which offered AIMS2 students opportunities to develop technical and social skills necessary to succeed in an engineering and computer science career

meetings served simply as a time when AIMS2 students could strengthen ties with students with whom they shared common cultural, social, and academic lenses and ways of interpreting their experiences on campus and in the major

Peer influence among AIMS2 students

AIMS2 student participants shared that they felt culturally validated, belonged on campus and academically supported in engineering and computer science fields

Peer-peer interaction likely contributed to these feelings, and the foundation of a strong peer environment for **AIMS2 students** included peer mentoring and peer tutoring

To see senior-standing members in the major who came from similar cultural backgrounds and communities may have confirmed for AIMS2 students at CSUN that they could succeed as university students in academically rigorous fields.

Professional society participation

AIMS2 students could see themselves as capable learners and future engineers or computer scientists because they saw people who looked like them and shared their cultural values in positions at engineering and computer science firms and in positions of scholarly and organizational leadership

Recommendations for practice

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- Structure **peer-peer interaction** in such a way gets AIMS2 students to stay on campus and engage in activities where they see and talk with each other = peer structures layered with low-income Latino/a students in positions of expertise and leadership—through peer tutoring and mentoring—is essential to growth as students and future engineers and computer scientists

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- Frequent and quality **interaction with faculty in the major** provides a basis for pre- and post-transfer AIMS2 students to develop meaningful identities as student-scholars who are capable of learning as engineers and computer scientists

Recommendations for research

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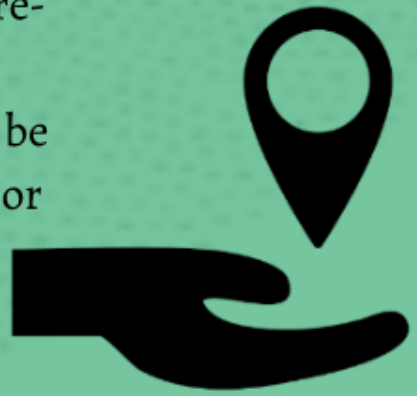
- Understanding the mechanisms of how **culturally-based professional organizations** like SHPE validate low-income AIMS2 students as pre-professional engineers and students in the major would help institutions of higher education craft opportunities for students to be a part of these organizations either as student chapters on campus or regional/national events



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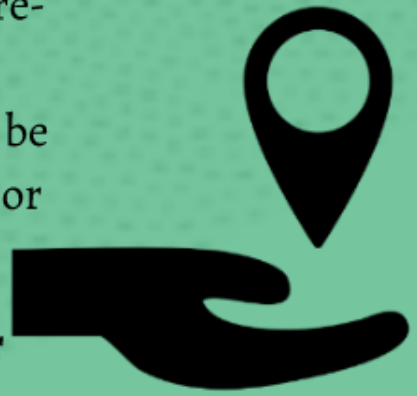
- Investigating the nuanced ways in which peers who serve in **peer mentoring or tutoring roles** work to validate AIMS2 students would extend findings from this study and promote peer programs in engineering and computer science fields in undergraduate education.



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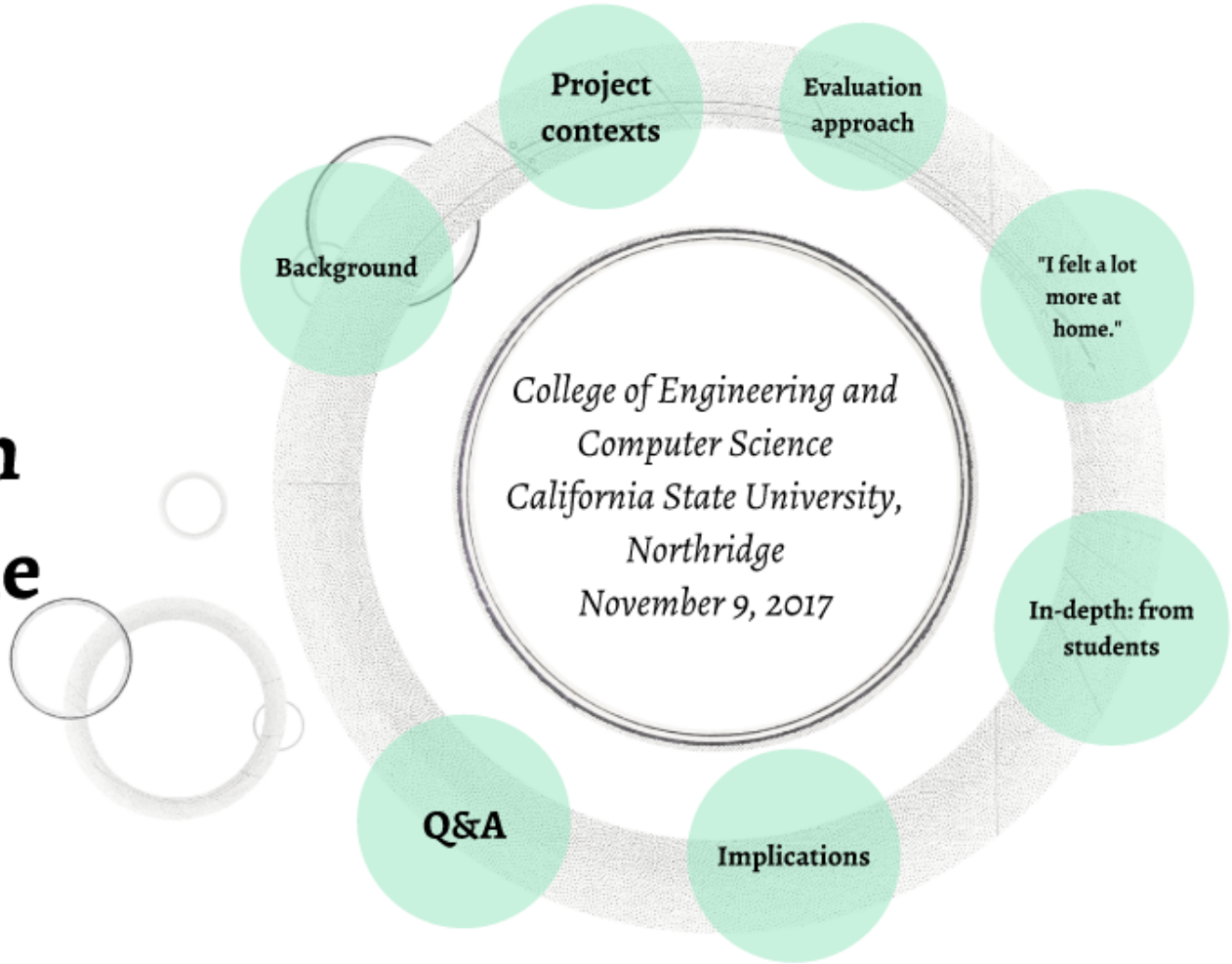


Q & A

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