



Data to Inform and Assess Curricular Innovations

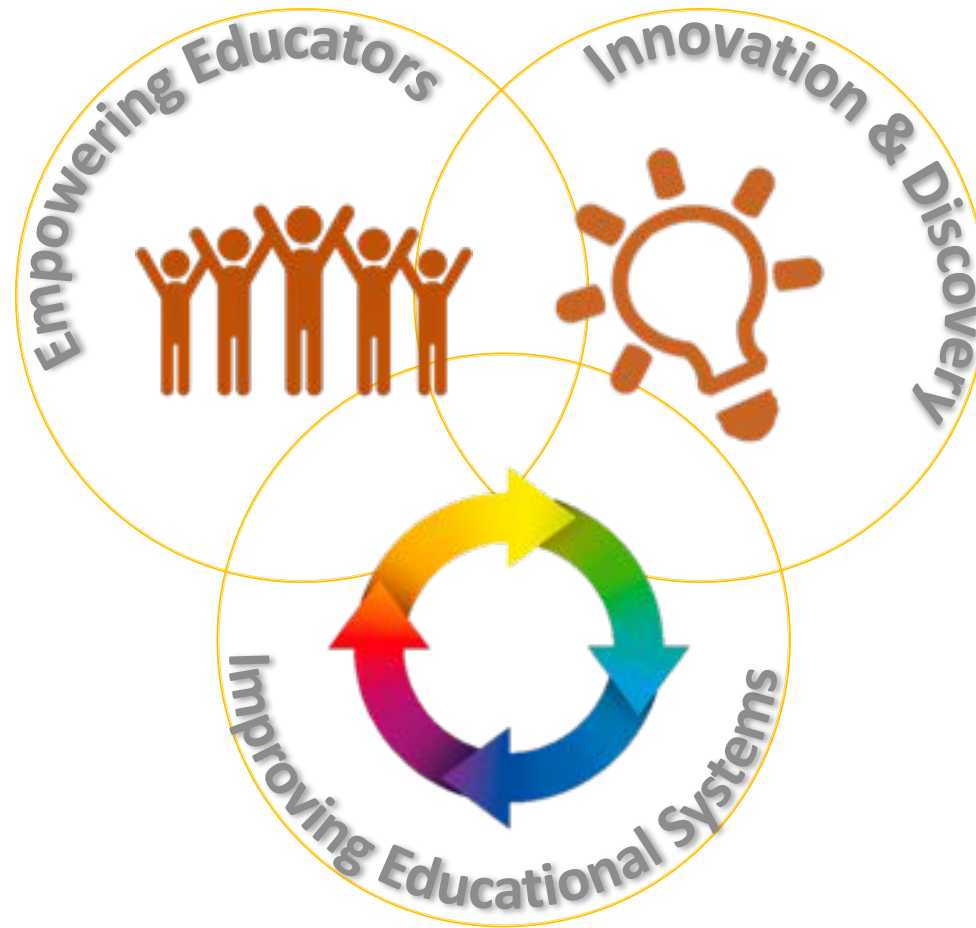
MARCO MOLINARO, UC DAVIS | BRIAN SATO & RAY VADNAIS, UC IRVINE

Essential Questions & Data Sources



- Provides a set of questions that can be used at multiple levels to assess progress
- Identifies data sources and analytical tools to help answer these questions
- Recommends ways to address challenges to institutional and multi-institutional evaluation

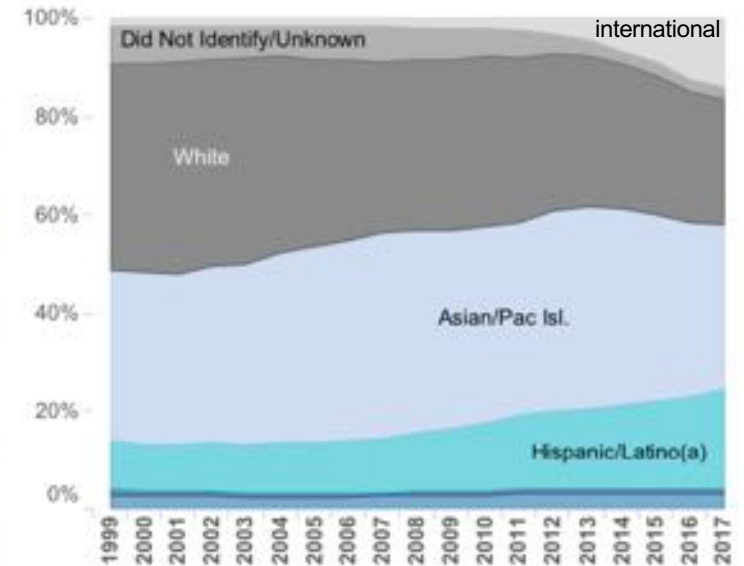
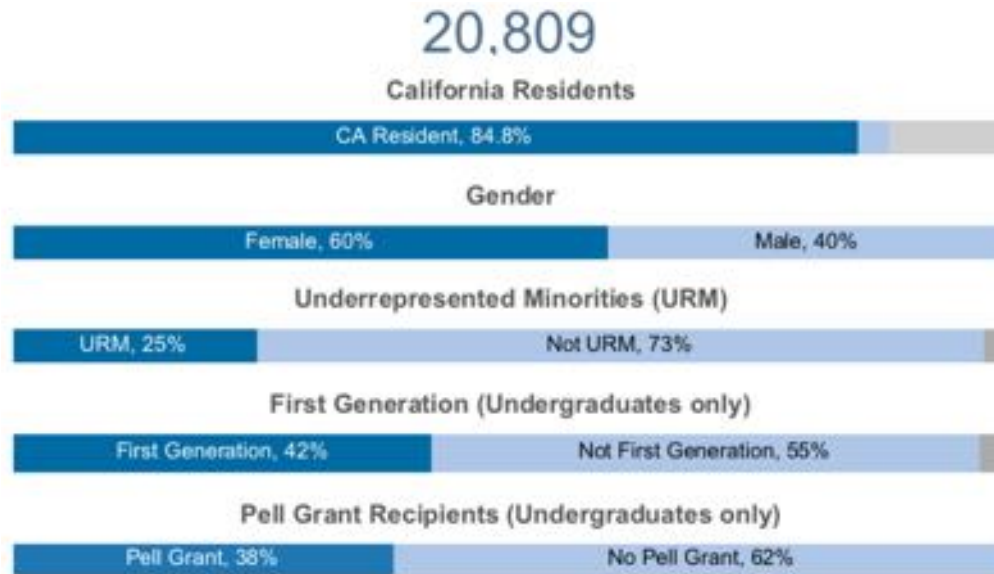
Supporting Undergraduate Instructional Improvement



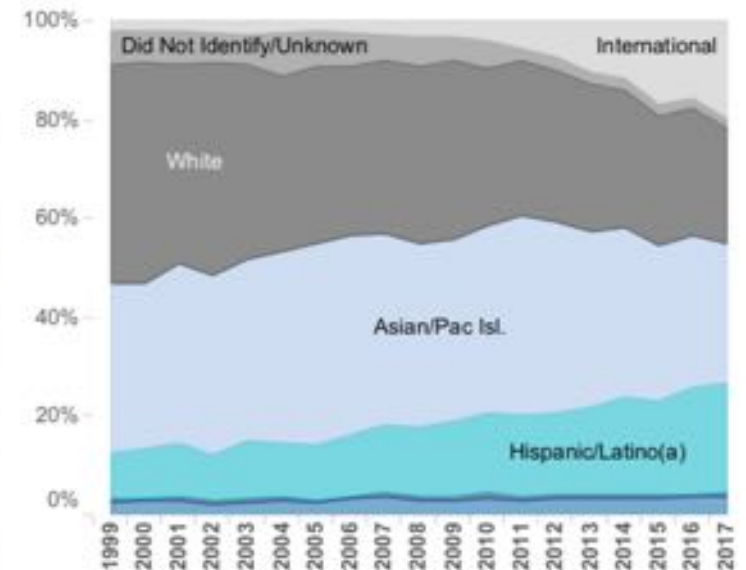
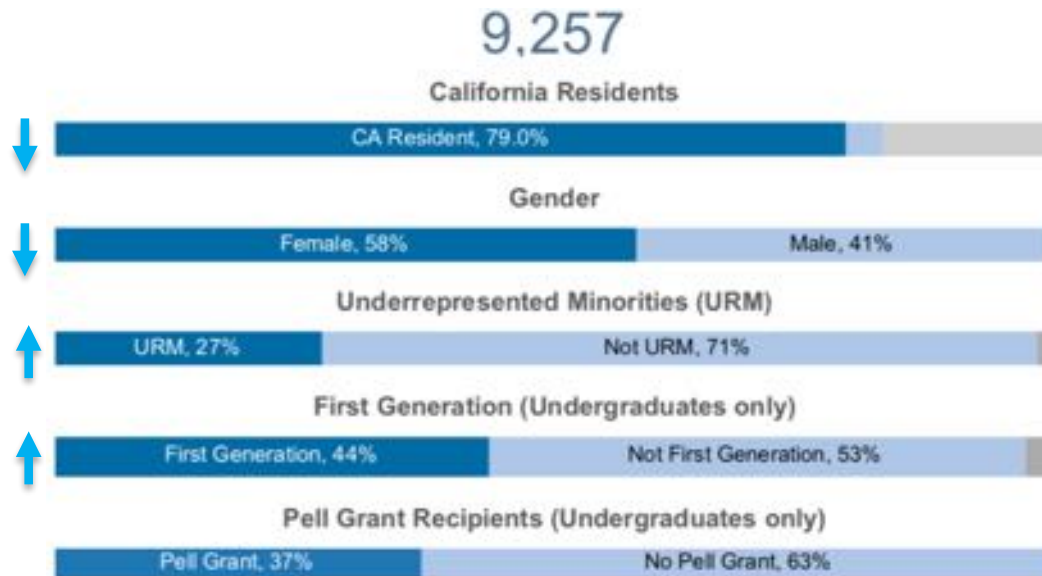
Our Changing Student Demographics

Fall 2017 Continuing and New Student Demographics

Ongoing Students

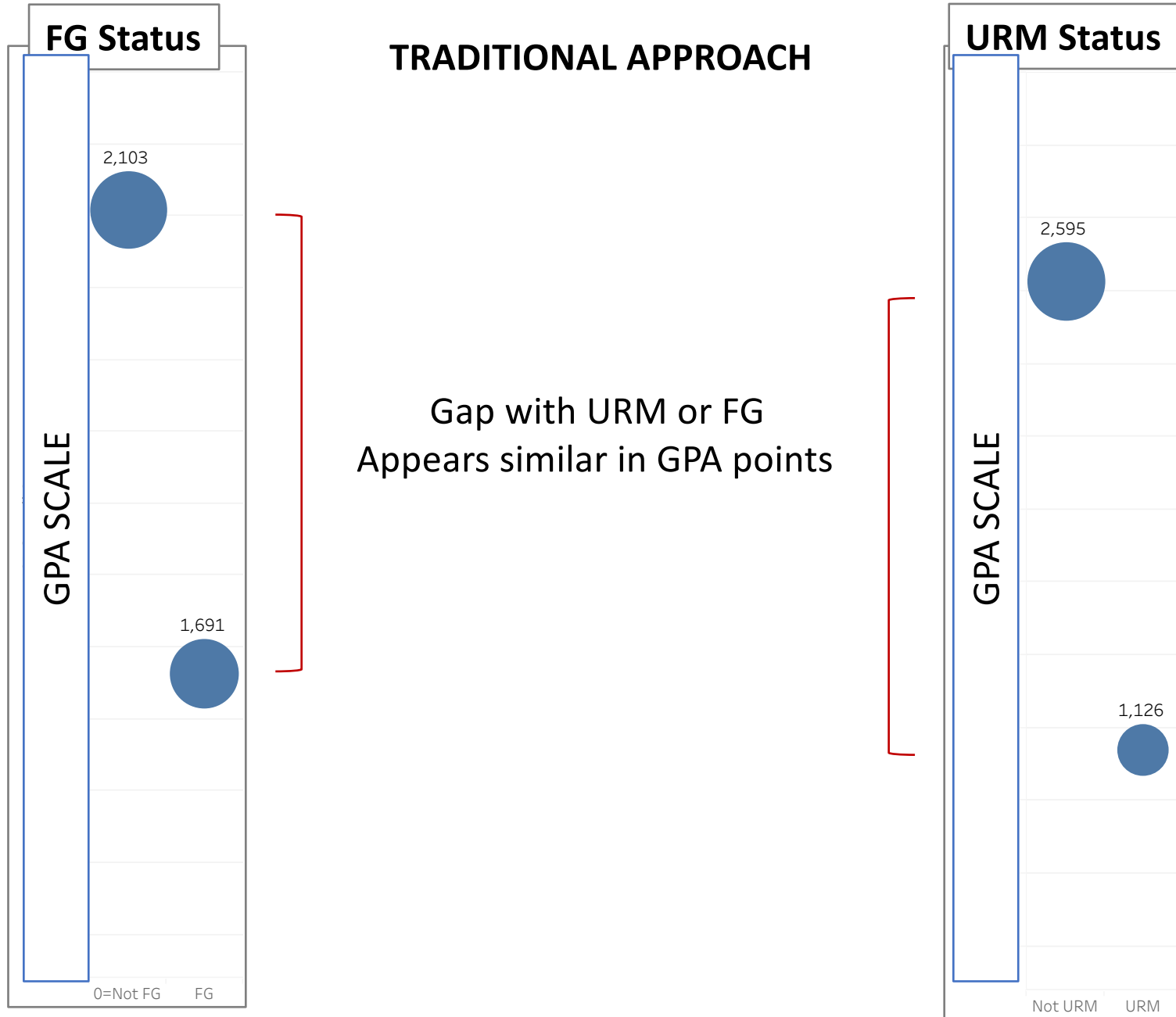


New Students



Example Work Focused Campus-wide

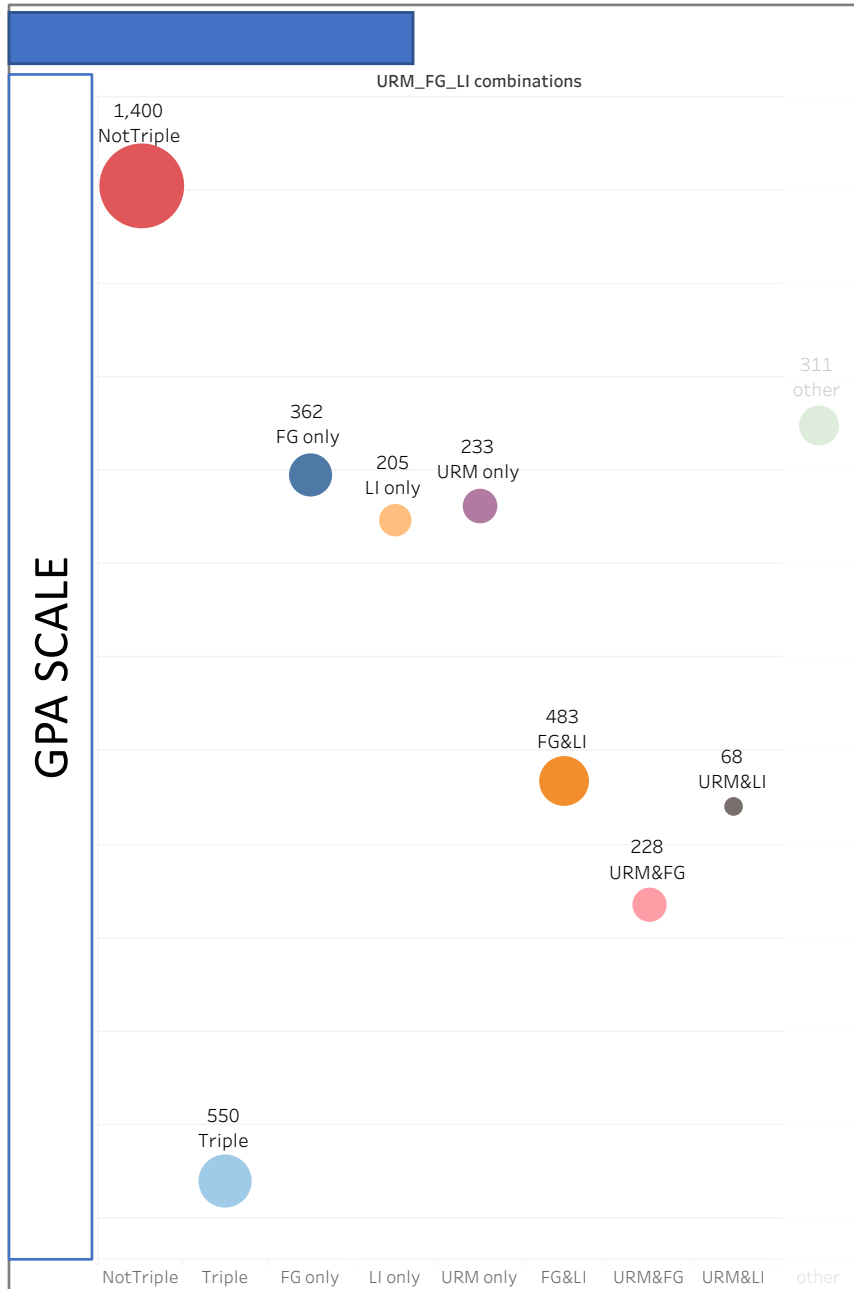
GPA Averages in All first year Courses & Opportunity – One AY*



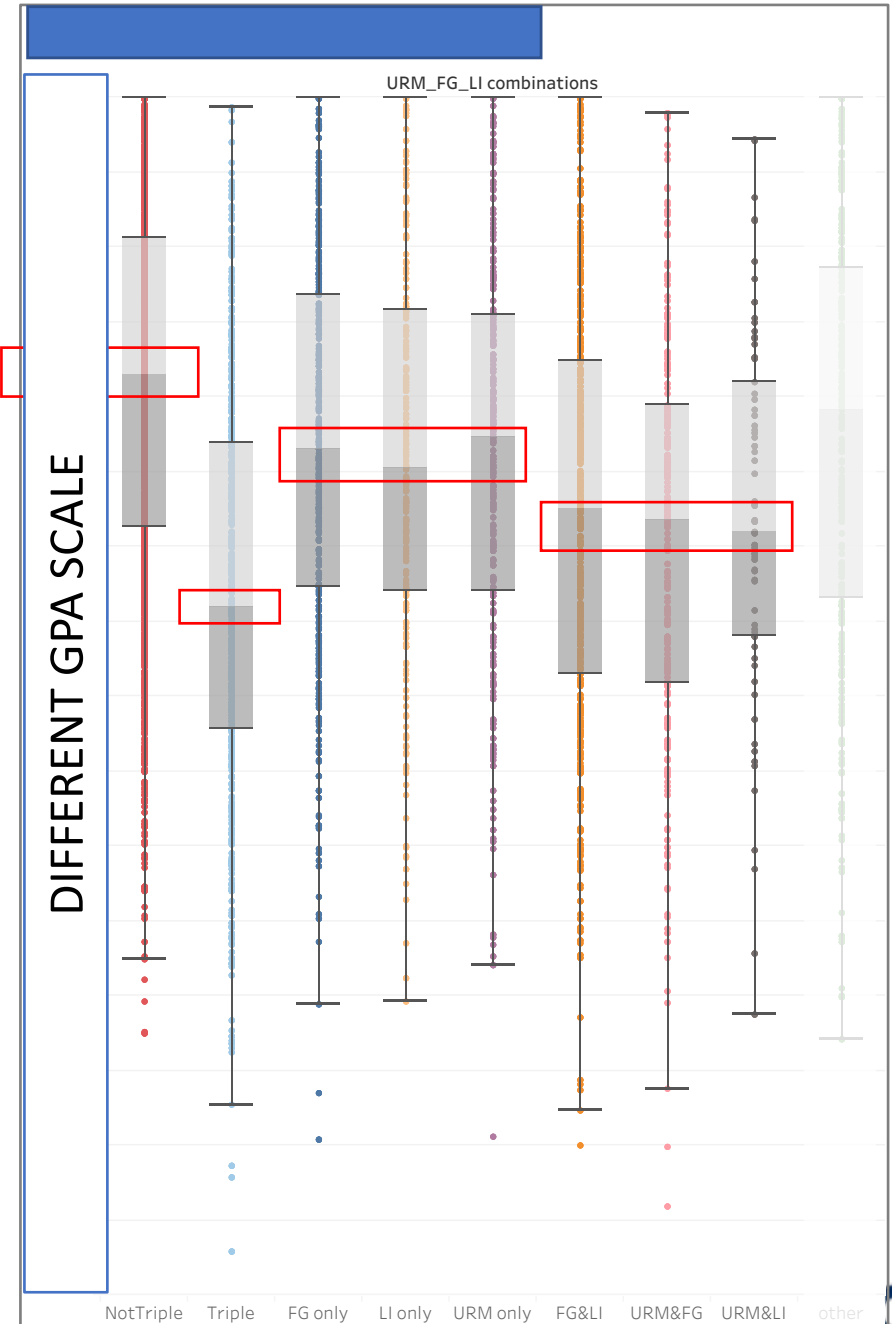
*CA residents only

GPA Averages in All first year Courses & Opportunity – AY 2015-16*

Averages vs Box Plots



NOTE SCALE CHANGE



*CA residents with valid zipcode only

What Might Cause These Differences?

Regional Opportunities Index (ROI)

<http://interact.regionalchange.ucdavis.edu/roi/about.html>

ROI Indicators

People

- **Education**
 - % of adults with post-secondary education
 - % 4th graders proficient in ELA
 - % 4th graders proficient in math
 - Elementary school truancy rate
- **Economy**
 - % of adult population employed
 - % of households above 200% FPL
- **Housing**
 - % of households who own home
 - % of households paying <30% of income on housing
- **Mobility/Transportation**
 - % who commute 30 min. or less
 - % households with at least 1 vehicle for worker
 - Households with broadband
- **Health/Environment**
 - % healthy weight babies
 - % births to teens
 - % deaths to <75 year olds
- **Social/Political Engagement**
 - % CVAP that voted in 2010
 - % households not linguistically isolated

UCDAVIS
CENTER FOR REGIONAL CHANGE

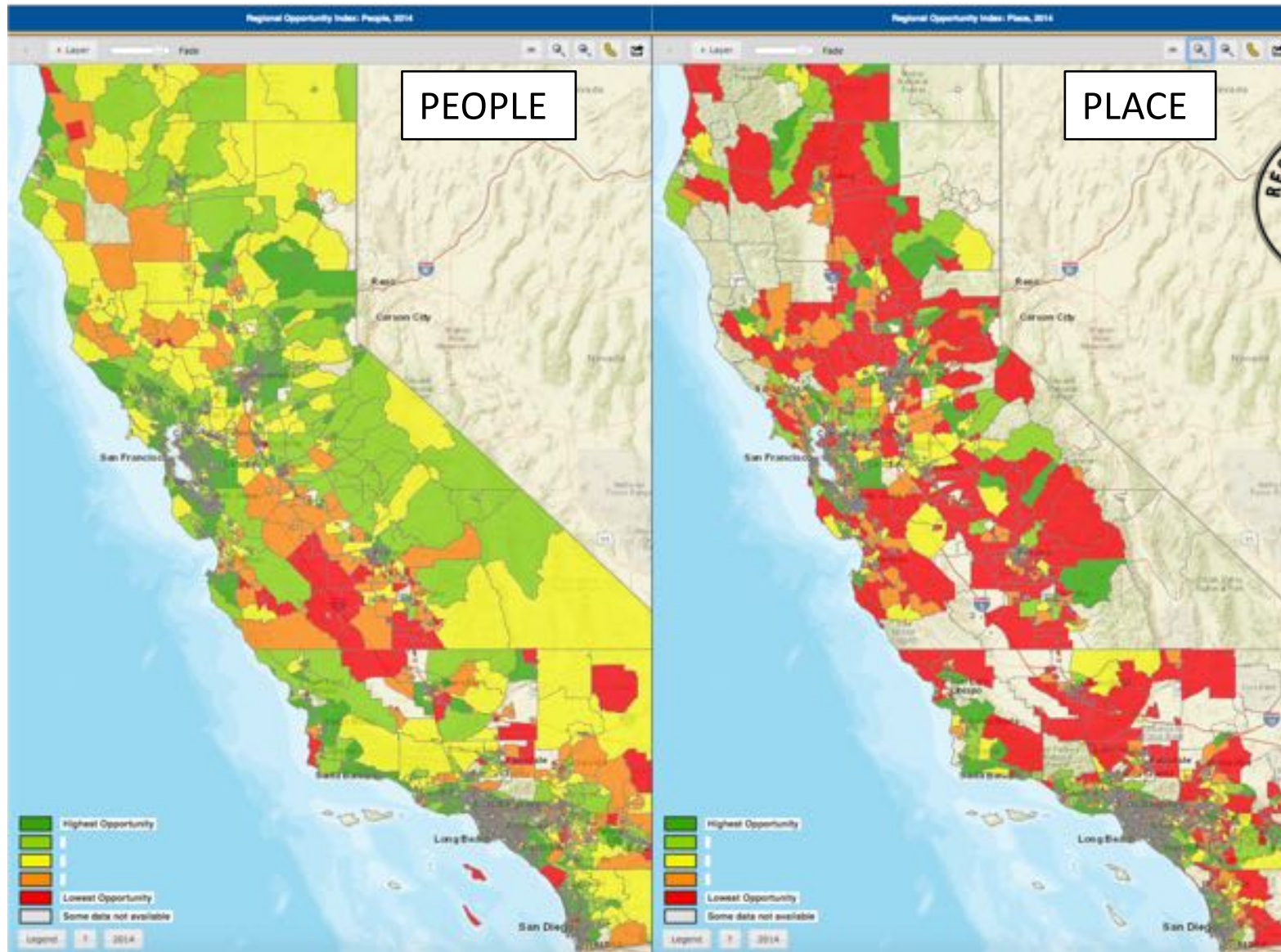
Place

- **Education**
 - High school graduation rate
 - High school grads college ready
 - % elementary teachers with 5 years experience and more than BA degree
 - High school suspension and expulsion rate
- **Economy**
 - Jobs within 5 mile radius per 1000 population
 - % jobs that are in high-paying industries within 5 mile radius
 - % job growth in last year within 5 mile radius
 - Banks per 1000 population within 5 mile radius
 - % change in number of employers within 5 mile radius, 2009-2011
- **Housing**
 - % homes with <= 1 occupant per room
 - Ratio of median income to median home value
- **Health/Environment**
 - % mothers receiving prenatal care in first trimester
 - % with access to full-service grocery stores
 - Healthcare provider locations (5 miles) per 1000 population
 - PM2.5 score
- **Social/Political Engagement**
 - % who live in same residence as a year ago
 - % U.S. citizens



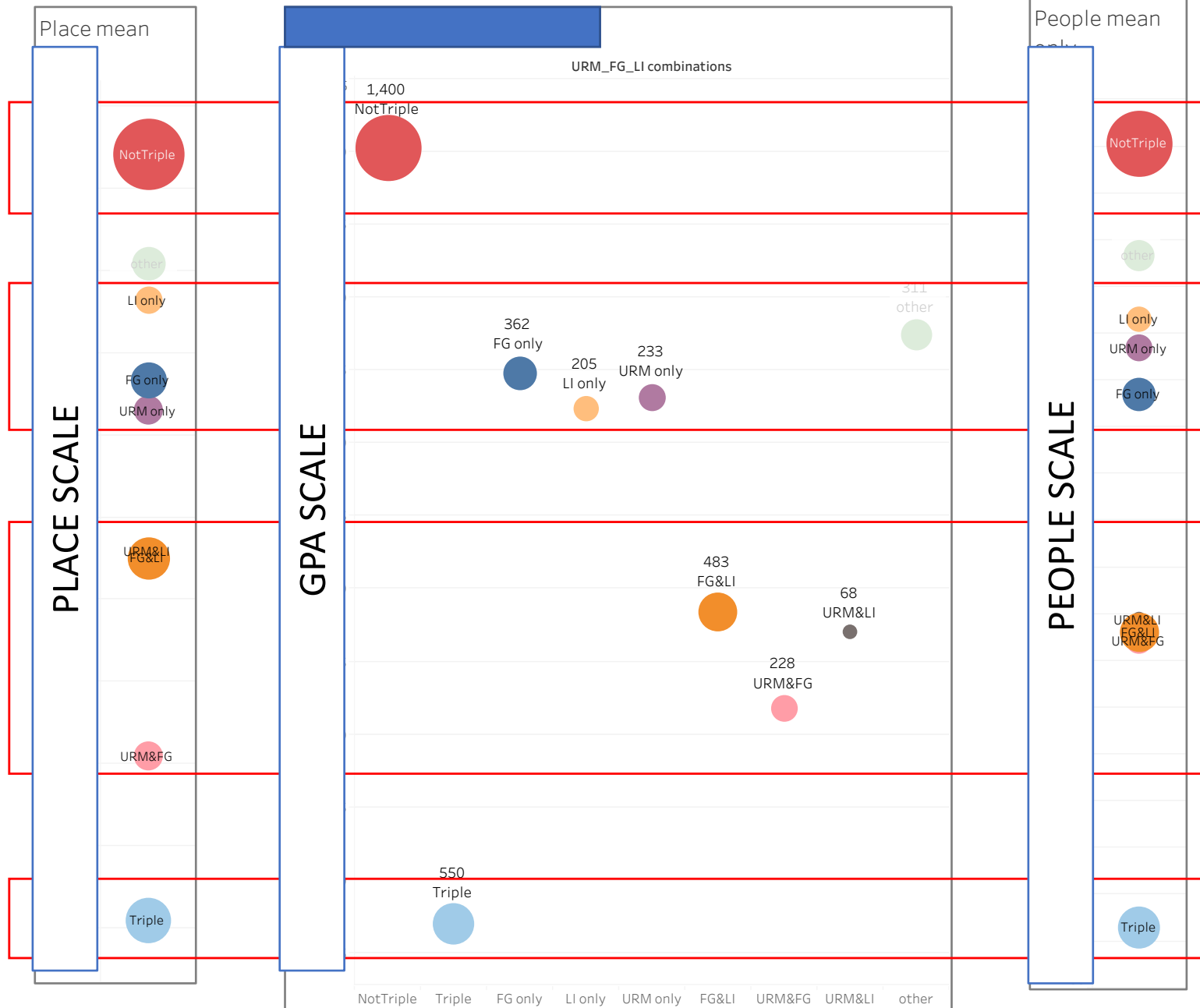
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CENTER FOR REGIONAL CHANGE

Regional Opportunities Index (ROI)



<http://interact.regionalchange.ucdavis.edu/roi/webmap/webmap.html>

GPA Averages in All first year Courses & Opportunity – One AY*



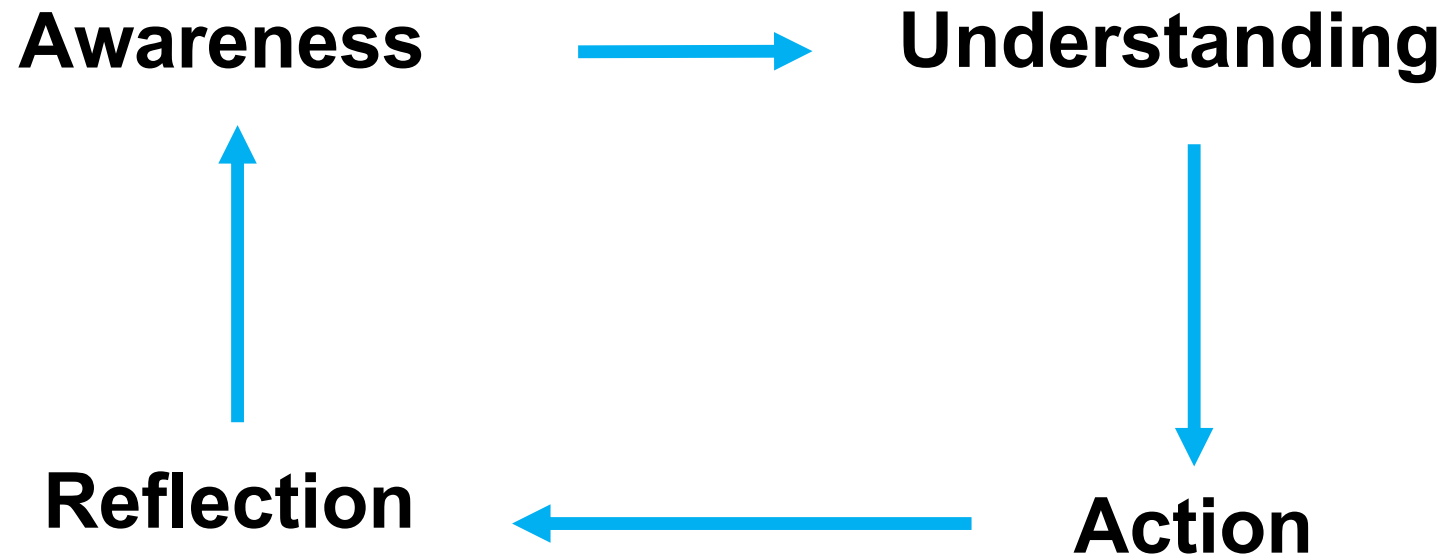
*CA residents only



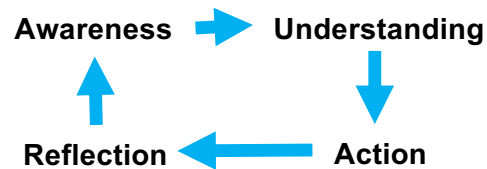
Exploring How We Can Approach Change

Cycle of Progress

Fostering a Cycle of Progress



Cycle of Progress

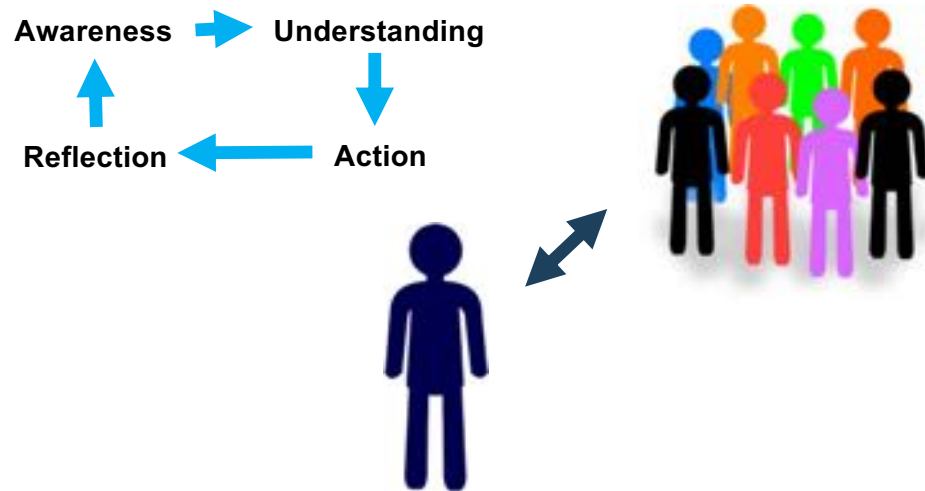


Conscious effort to focus on Faculty, Professional Staff and Administrators to impact Student & System outcomes



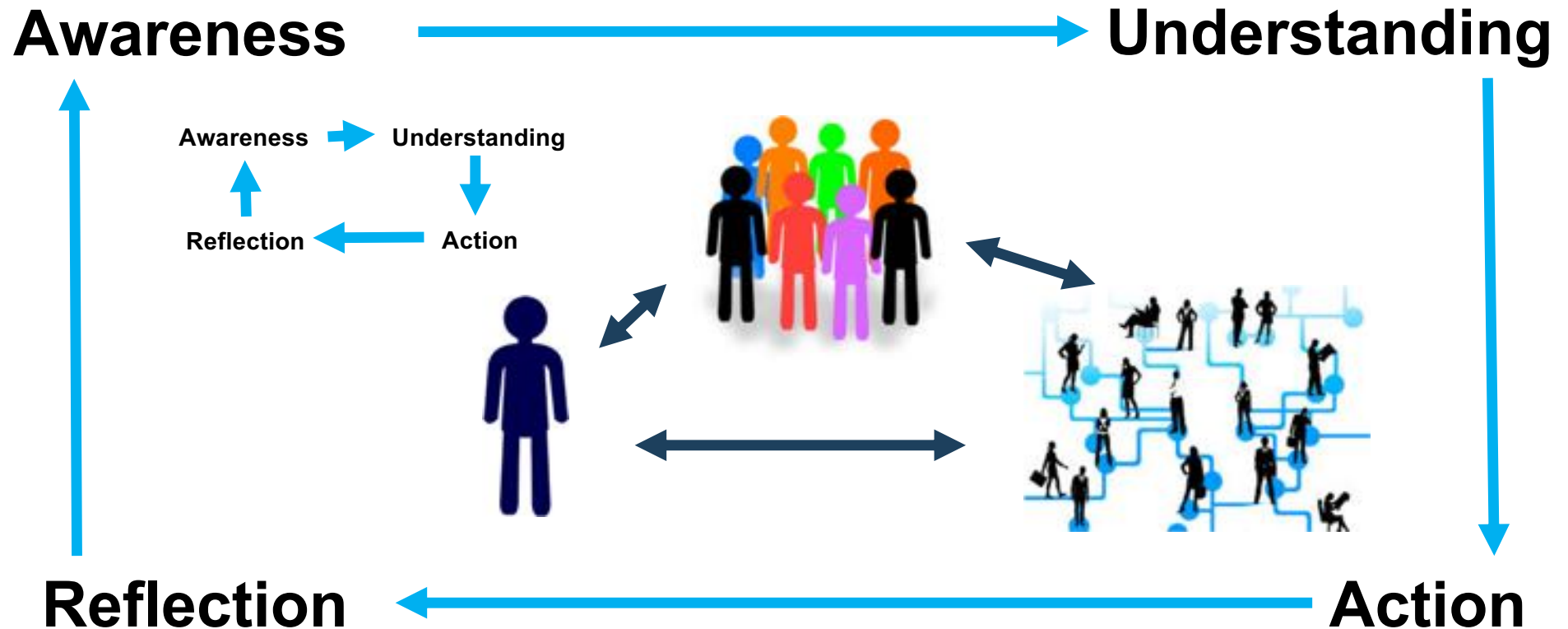
One Person's Action can spread awareness and understanding

Cycle of Progress



One Person's Action can spread awareness and understanding, a group expands

Cycle of Progress



One Person's Action can spread awareness and understanding, a group expands, the system lingers

Now to UC Irvine

Now to UC Davis

Tools & Processes to Support Faculty

Faculty

Know Your Students

Custom Analyses

Self-Service
Community
Targeted Support

Departmental Leadership

Department Diagnostics

Self-Service
Routine Analyses
Deep Dives

College/Univ Leadership

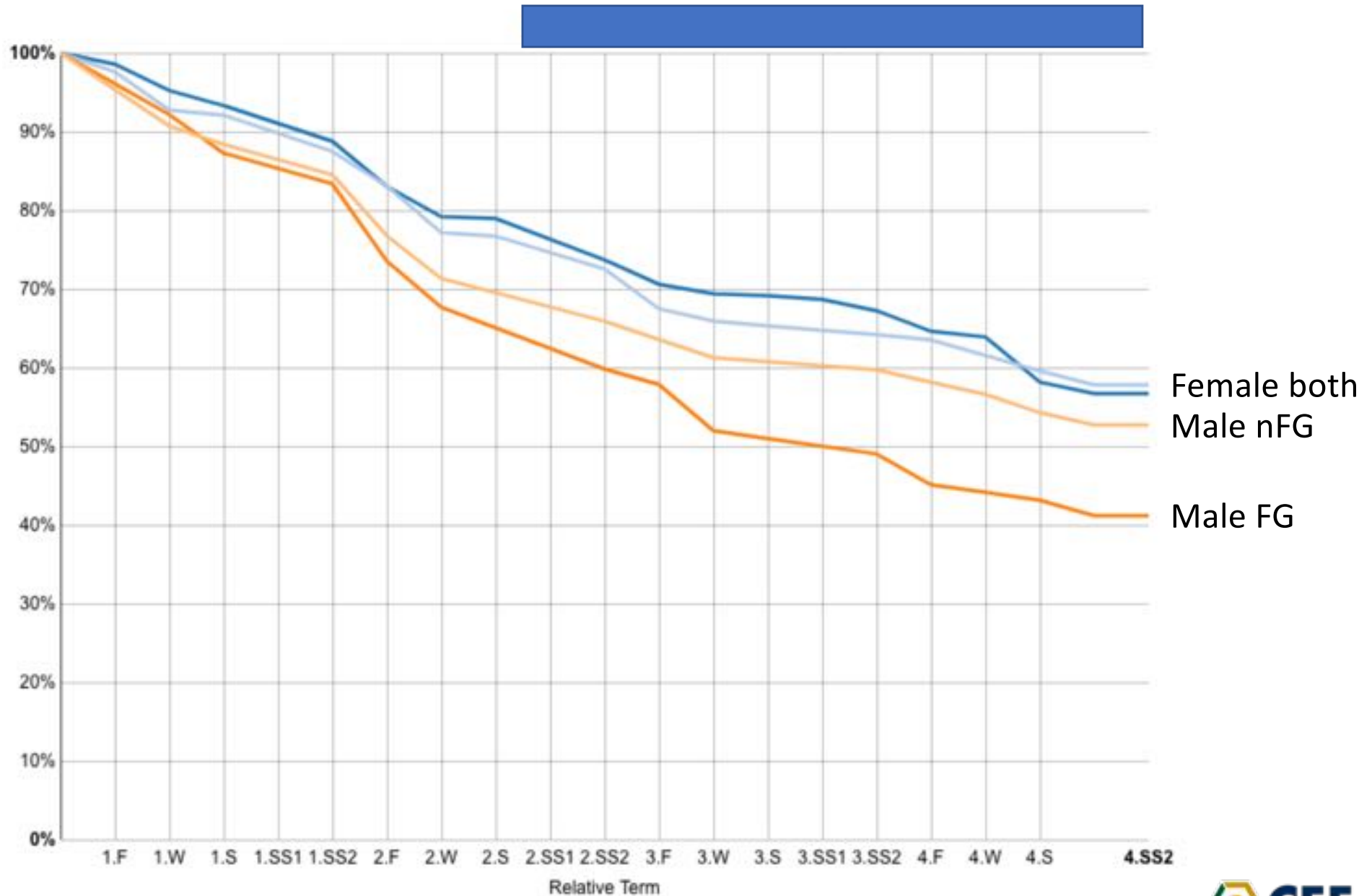
Dean's Undergrad Metrics

Systemic Studies
(Intersectionality, WLD, ...)

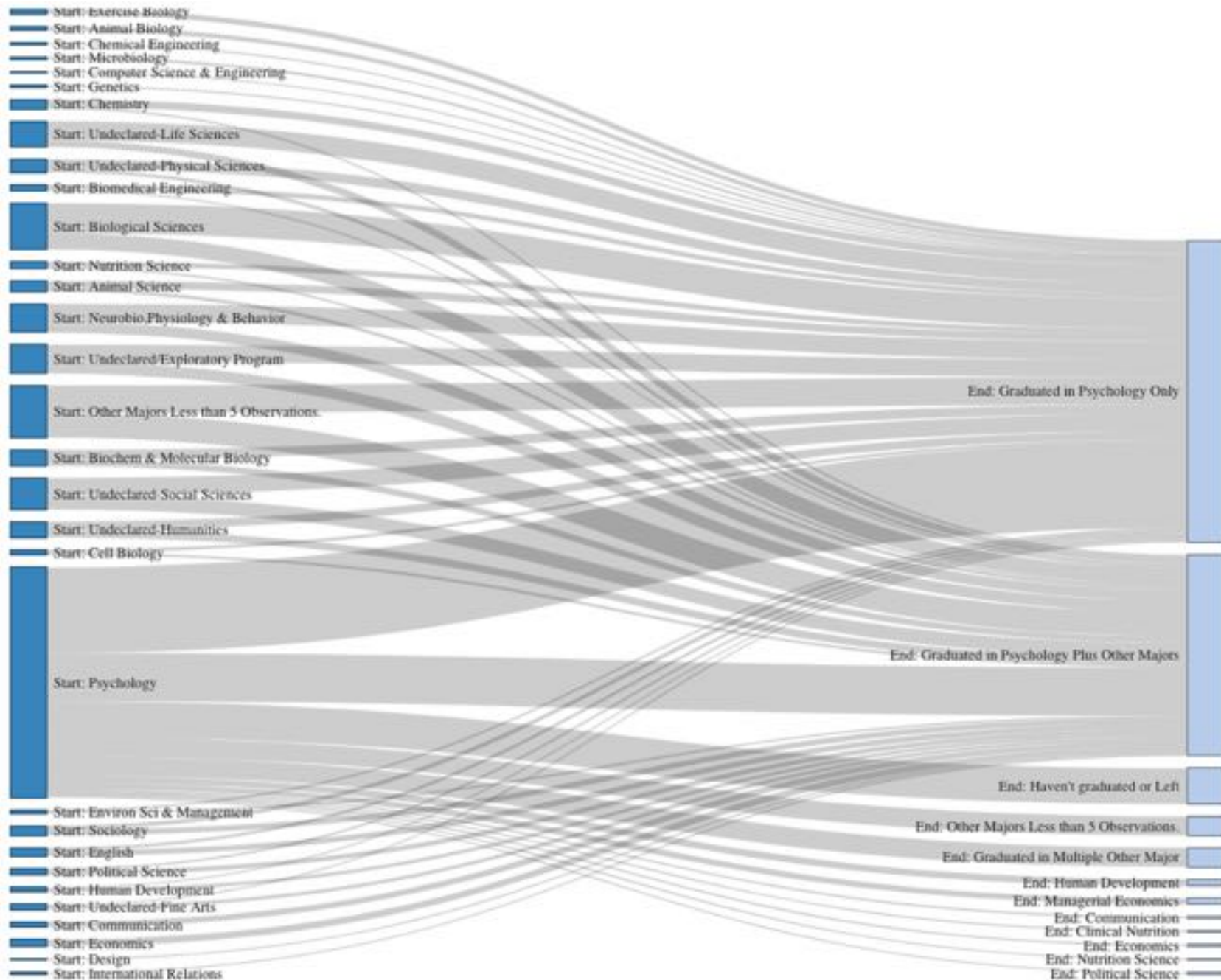
Ongoing
Focused Support

Example Work Focused at Department/College Level

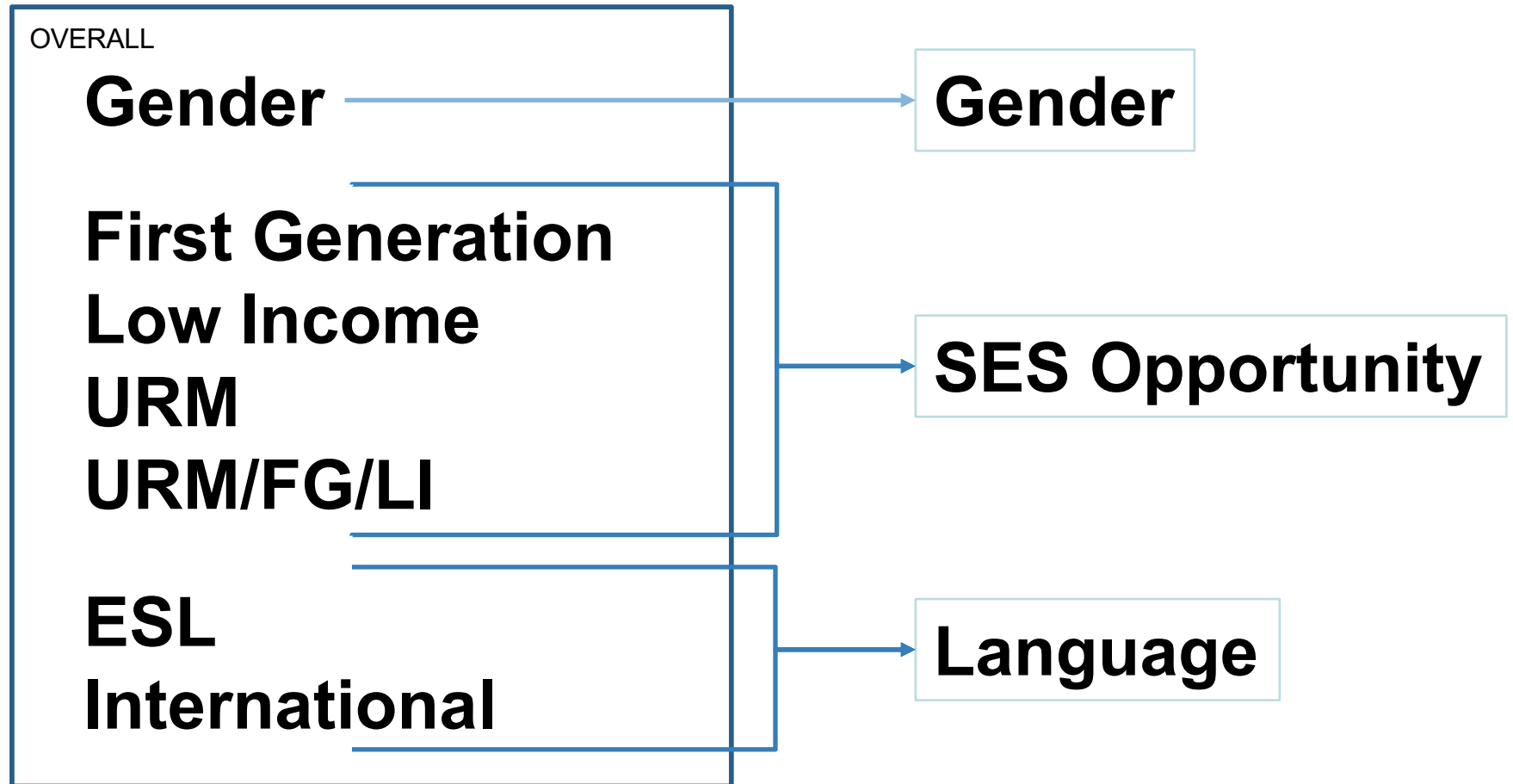
Retention in a Major – Multiple freshmen cohorts



Freshmen Student Migrations – Multi-year starting cohorts



DFW and GPA Gap Variables



All Variable Gaps (DFW, GPA) for a College

AWARENESS ONLY

Gender	1 st Gen	Low Inc	URM	URM/FG/LI	Int'l	ESL
Gender	Socio-Economic Opportunity				Language	

UNDERSTANDING?

INITIAL IDEAS

Absolute vs weighted impact

Raw vs adjusted for prior characteristics

Specialness of first year courses

Course order

Course size

Grading practices – norm vs criterion referenced

Instructional variability

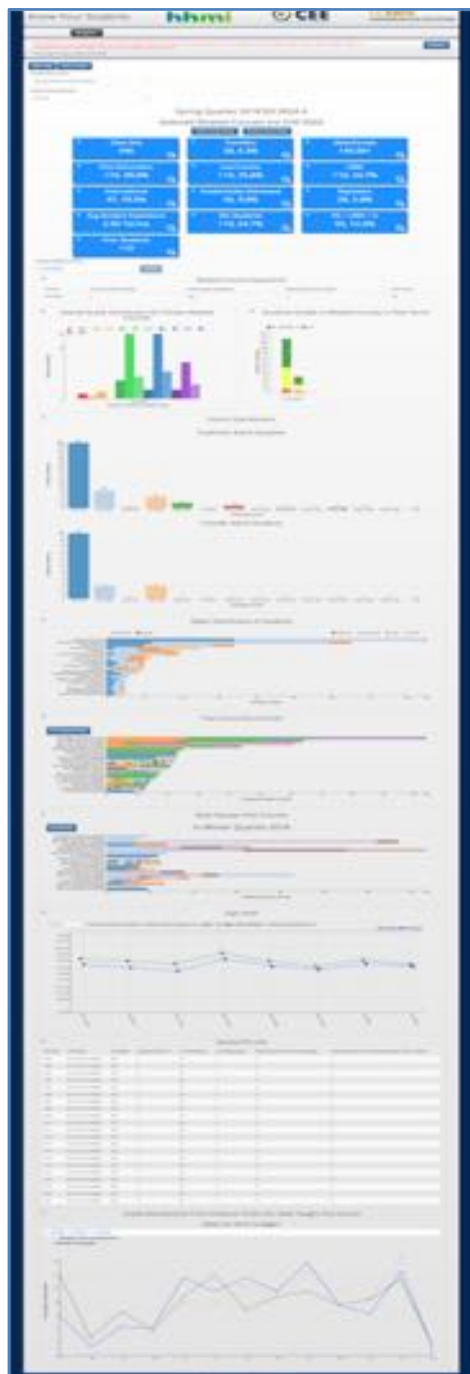
And then we need to move on to ACTION and REFLECTION

Example Work Focused at Course/Instructor Level

Multidimensional Instructional Development for Achievement and Success (MIDAS)

UCD Inclusive Excellence project funded in part by HHMI – Facciotti/Molinaro Co-PIs

Know Your Students Dashboard



Teaching Strategies



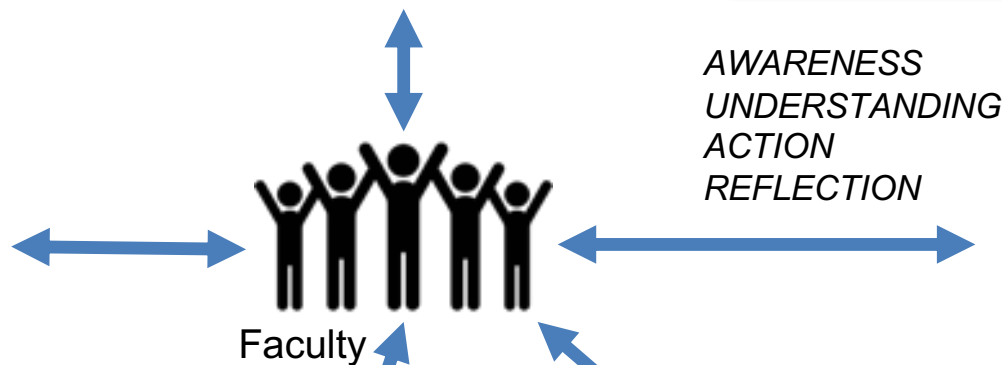
Bibliography



Major findings related to emergent research on: low-income/SES, first generation, URM & transfer student success

Academic preparedness, motivation, and persistence

Implications for pedagogy



Faculty

AWARENESS
UNDERSTANDING
ACTION
REFLECTION



Teaching Portfolio



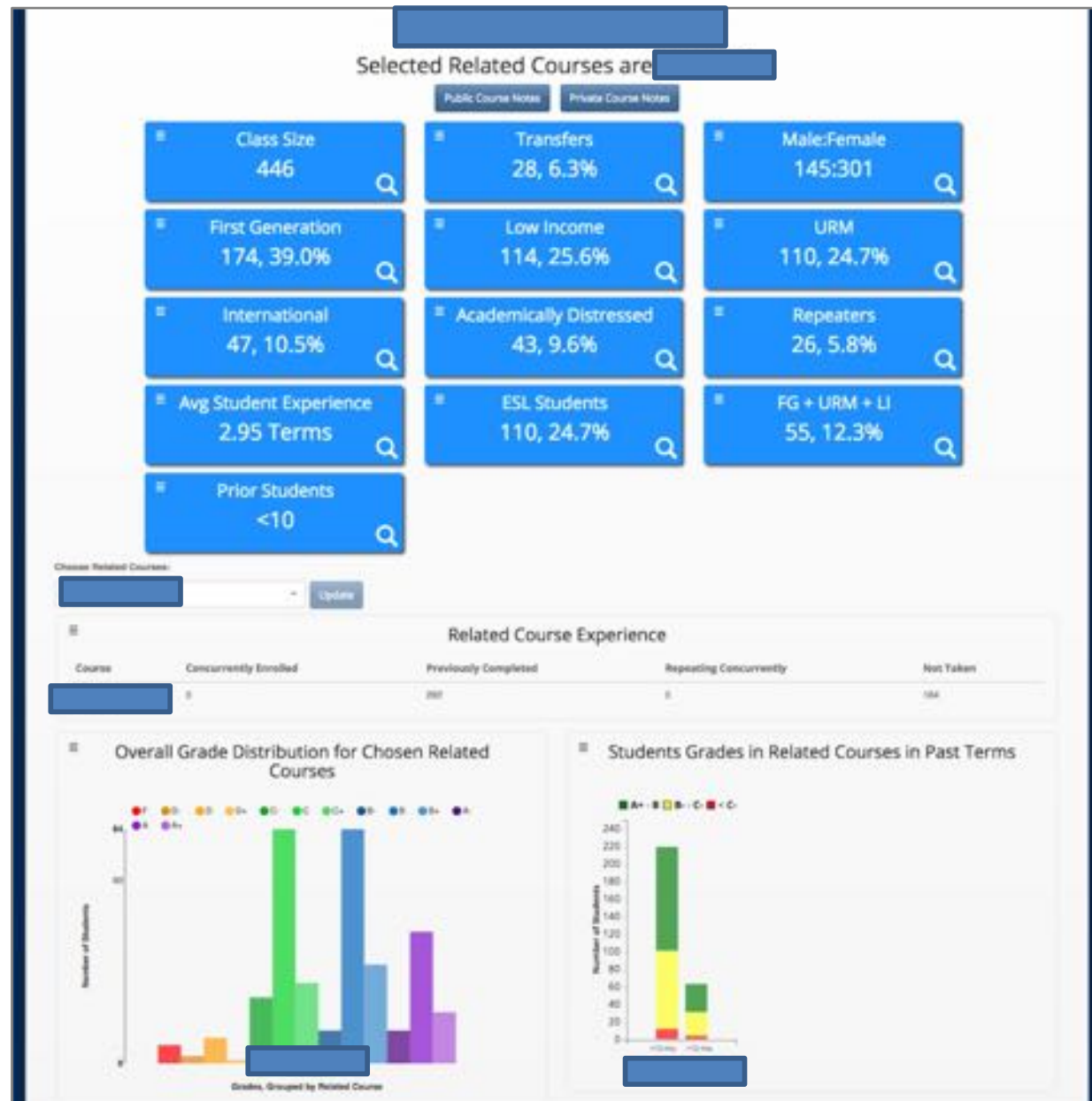
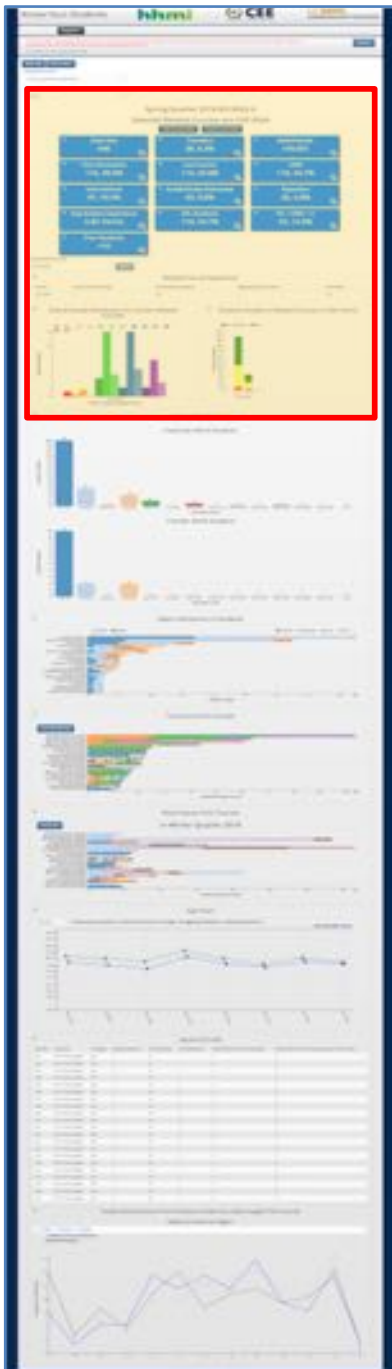
Instructional & Support Community



Instructional Exploration
& Data Gathering

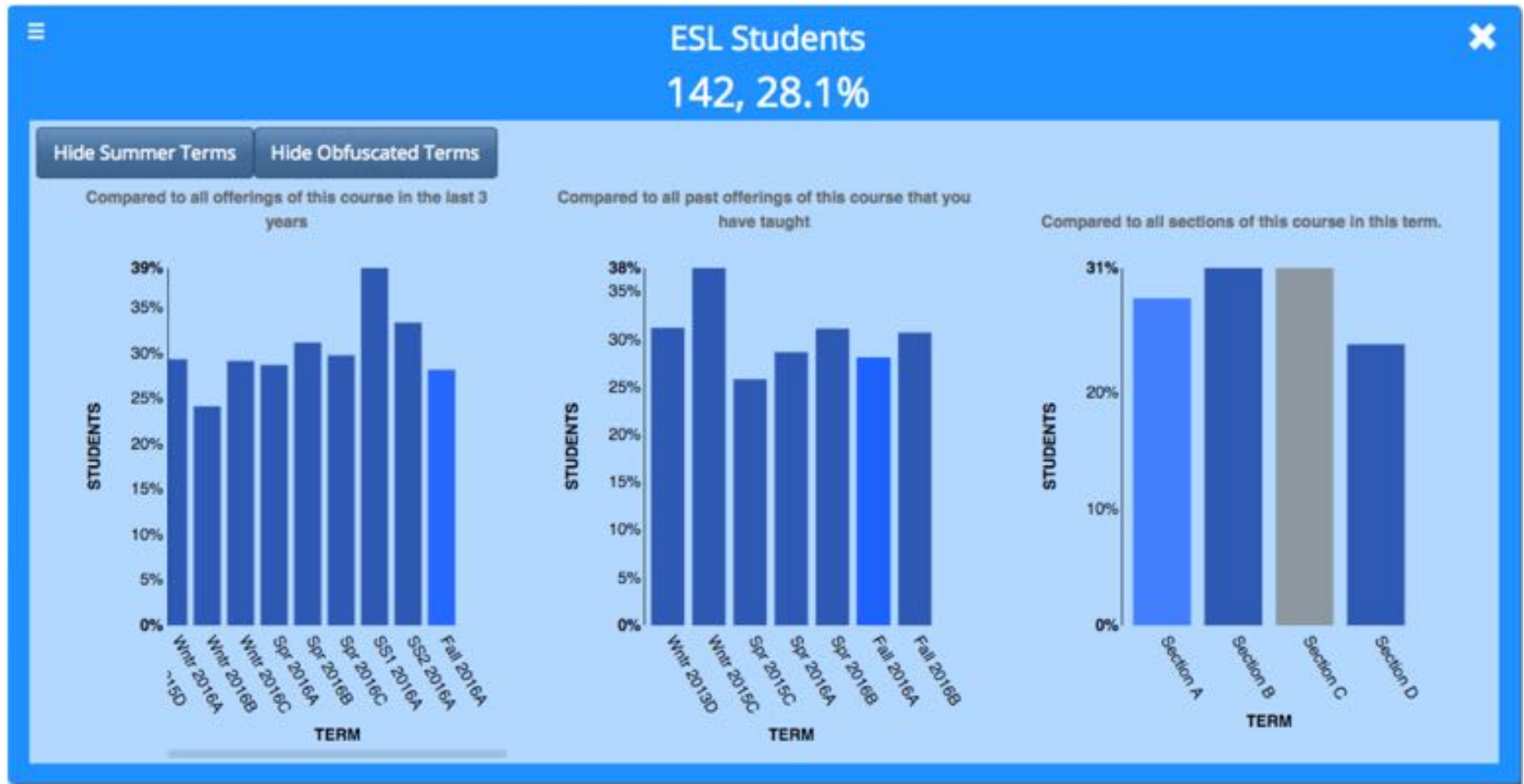


Know Your Students— FG and Repeaters



Course taught by HHMI Project Co-PI Prof. Marc Facciotti

Know Your Students— ESL Example



Know Your Students— First Generation Just in Time Teaching

Just In Time Teaching Tips

Show More

Primary Content

Who are first-generation students?

See first-generation students as pioneers in higher education

First-generation students may have extensive and diverse demands on their time outside of school

First-generation students may face serious financial hardships

First-generation students may experience the sense that they don't fit in at home or at school



A first-generation student is identified as a US student whose parents/guardians have not received a four-year, US bachelor's degree (Engle & Tinto, 2008). 42% of UC Davis students self-identify as first-generation students (UC Davis Undergraduate Admissions and UC Info Center, Fall 2015). Numerous studies have indicated that first-generation students tend to experience a variety of educational, financial, and social barriers that make successful completion of a bachelor's degree more difficult than for their continuing-generation peers (Collier & Morgan, 2008; Covarrubias & Fryberg 2015; Engle & Tinto, 2008; Ishitani, 2006; Lohfink & Paulsen, 2005; Stephens et al., 2012). However, when faculty partner with administrators and educational support staff, there is much that can be done to ensure the success of first-generation students.

This tip came from the JITT below:

Supporting First-Generation University Students Series
PART 1: Promoting Academic Success

A first-generation student is identified as a US student whose parents/guardians have not received a four-year, US bachelor's degree (Engle & Tinto, 2008). 42% of UC Davis students self-identify as first-generation students (UC Davis Undergraduate Admissions and UC Info Center, Fall 2015). Numerous studies have indicated that first-generation students tend to experience a variety of educational, financial, and social barriers that make successful completion of a bachelor's degree more difficult than for their continuing-generation peers (Collier & Morgan, 2008; Covarrubias & Fryberg 2015; Engle & Tinto, 2008; Ishitani, 2006; Lohfink & Paulsen, 2005; Stephens et al., 2012). However, when faculty partner with administrators and educational support staff, there is much that can be done to ensure the success of first-generation students.

See first-generation students as pioneers in higher education
One important way to better support first-generation students is to modify the way we think about them, including our perceptions of the ways their prior experiences and backgrounds influence their engagement (Greenwald, 2012). Greenwald (2012) argues that by thinking of first-generation students as "pioneers" in their families and their communities, we can better recognize the unique skills and experiences they bring to our classrooms. An example of how you might do this in your own classroom is to consider what it means to be a first-generation student for different students in your class. The first-generation experience is often perceived to be similar for all such classified students. However, it's important to recognize that first-generation students are also a diverse group in itself (Engle & Tinto, 2008): some are low-income, some are minority/non-White, some are disabled, some are English Learners, some may be undocumented. Keep in mind that not all students share all of the same ethnic, socioeconomic, linguistic, and cultural characteristics.

Recognize some of your students' current life situations
Engle & Tinto (2008) emphasize the fact that first-generation students face a variety of extracurricular challenges to completing a bachelor's degree.

First Generation 200, 39.6%

Hide Summer Terms | Hide Obfuscated Terms

Compared to all offerings of this course in the last 3 years

Term	Students
Fall 2015	45
Spring 2016	35
Fall 2016	38
Spring 2017	40
Fall 2017	42
Spring 2018	45
Fall 2018	48
Spring 2019	50
Fall 2019	52
Spring 2020	55
Fall 2020	58
Spring 2021	60
Fall 2021	62
Spring 2022	65
Fall 2022	68
Spring 2023	70

Compared to all past offerings of this course that you have taught

Term	Students
Fall 2015	35
Spring 2016	40
Fall 2016	45
Spring 2017	50
Fall 2017	55
Spring 2018	60
Fall 2018	65
Spring 2019	70
Fall 2019	75
Spring 2020	80
Fall 2020	85
Spring 2021	90
Fall 2021	95
Spring 2022	100
Fall 2022	105
Spring 2023	110

Compared to all sections of this course in this term

Term	Students
Fall 2022	30
Spring 2023	35
Fall 2023	40
Spring 2024	45

JiTT (Just in Time Teaching)

Promoting First Generation Student Academic Success



UC DAVIS
Center for Educational Effectiveness
Office of Undergraduate Education



Supporting First-Generation University Students Series PART 1: Promoting Academic Success

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Recognize some of your students' current life situations

Engle & Tinto (2008) emphasize the fact that first-generation students face a variety of challenges to completing a bachelor's degree.

Challenges	Explanations	Teaching Suggestions
Extensive and diverse demands on their time outside of school	First-generation students often commute, work many hours, and have unusual schedules. They may have part-time enrollment status, interruptions in their enrollment, and occasional impediments to their persistence.	Help students with time management, designing assignments and allow for research or collaboration done outside of class or off-campus. Do not require the use of resources that are limited or only available at certain times.
May face serious financial hardships	Be aware that first-generation students may face financial issues that are similar and different from other students.	Unless students need to buy particular supplies or apps for your class, be cognizant of additional financial burdens. For example, consider using open source software (e.g., R), open source textbooks, and other free course materials if possible.
The sense that they don't fit in at home or at school	First-generation students are developing a new set of language skills, academic skills, and beliefs as they learn to be college students. These may be different from those present in their families and communities.	Be aware that some students may hold contradictory feelings as they may sometimes believe that they do not fully fit in either academically or back in their communities.

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They may be multilingual and/or multicultural.	Some first-generation students may be bicultural and/or bilingual and/or multilingual, and may speak in different dialects in their communities and at home.	Support learning of academic language in and out of the classroom by using synonyms, and explaining the different linguistic demands of academic genres in your classroom.
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The role of faculty interaction in helping first-generation students succeed

First-generation college students typically apply to universities and undertake university study without guidance and/or culture from parents and family members who already attended and/or graduated from college. Therefore, their interactions with faculty represent an important source of information on the academic aspects of college life, as well as guidance on academic preparation, and how to get social and cultural capital to become successful college students. In fact, interactions with faculty have been shown to have a positive impact on retention of first-generation students in college (Wang, 2012, 2016).

Challenges	Explanations	Teaching Suggestions
May lack a clear sense of how college differs from high school or may lack a clear sense of what they need to do to persist in college life.	Some first-generation students may not clearly understand how college differs from high school or may lack a clear sense of what they need to do to persist in college life. Additionally, the first-generation students may be unclear that it is for students who come from college-educated families.	Transparent explanations of course outcomes and a syllabus is critical in helping first-generation students to understand (Bokros et al., 2016). Make sure to clearly outline your expectations in your syllabus, assignments, and other course materials, and allow plenty of time for questions. Additionally, Wang (2016) suggests that teachers should offer specific advice on how to succeed in their class, and help first-generation students connect with resources around campus (W. S. 2016, 2016).
May lack familiarity with university culture.	Many first-generation students may lack familiarity with the culture and expectations of the university. As such, some first-generation students may experience "imposter syndrome," or feel confusion, intimidation, stress, self-doubt, and low confidence as a result of their role of familiarity.	Try to emphasize campus resources with an emphasis on how they can help students manage the stress of being in the new environment of the university. If you know that a student may need more support, reach out to them or contact their advisor if possible.
May lack knowledge or confidence in approaching faculty.	First-generation students may not be familiar with the concept of establishing personal relationships with their professors as teaching assistants.	Make sure that students know you are available to talk if needed in class, after class, and/or during office hours, and try to be as welcoming as possible towards students so that they feel more comfortable reaching out. It can also help to share that the purpose of office hours is to build supportive relationships between professors and students, so that students feel more comfortable reaching out.

Adapted from: Lohfink, 2015.

Additional Resources

- [UC Davis Center for Educational Effectiveness](#)
- [UC Davis Center for Educational Effectiveness](#)
- [UC Davis Center for Educational Effectiveness](#)

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Office of Undergraduate Education

Additional Resources

Center for Educational Effectiveness (CEE), (2016). Supporting First-Generation University Students Series: Just in Time Teaching Resources. Retrieved from [cee.ucdavis.edu/first-gen](#)

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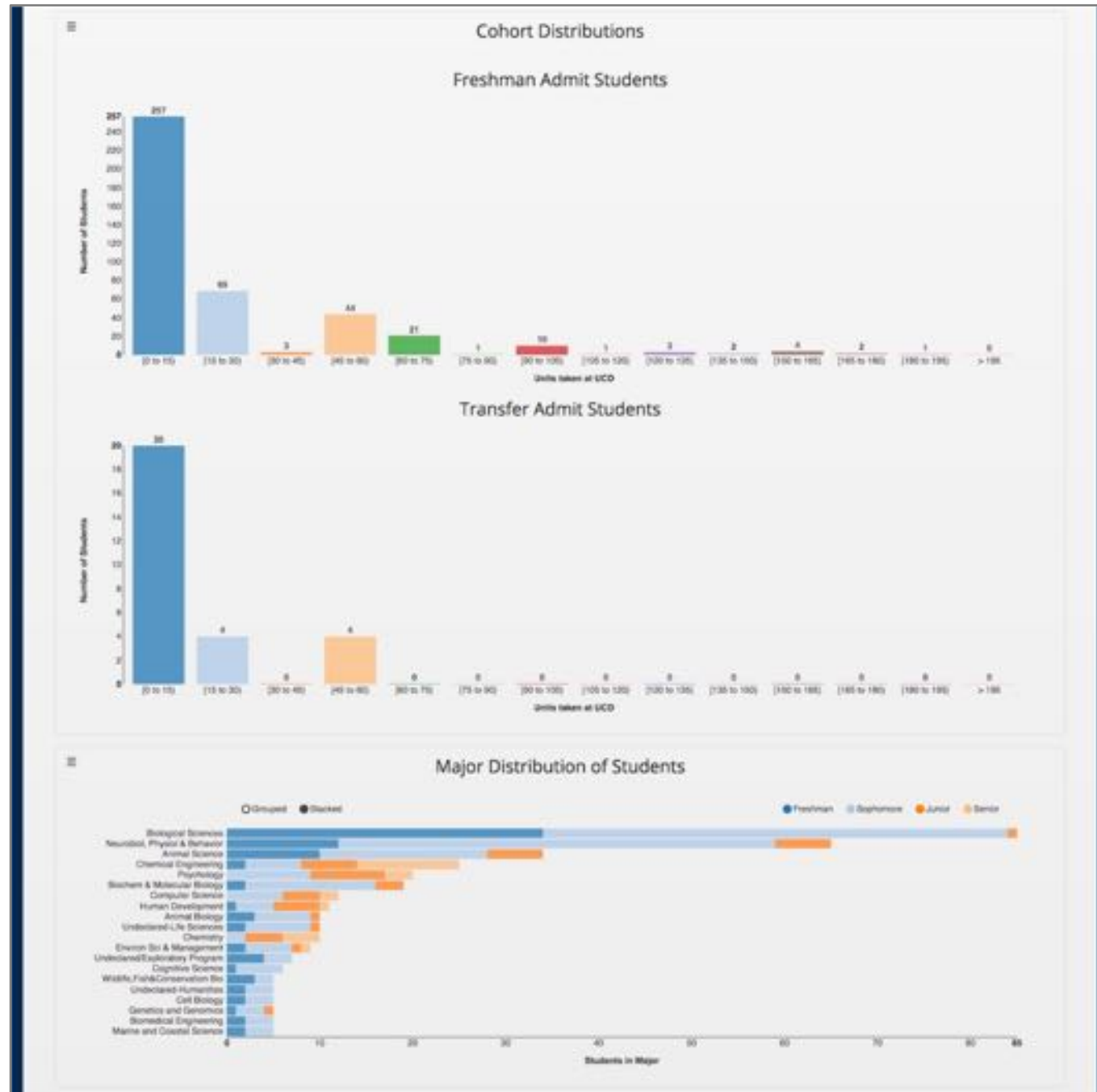
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Connecting to the Instructional Support Community

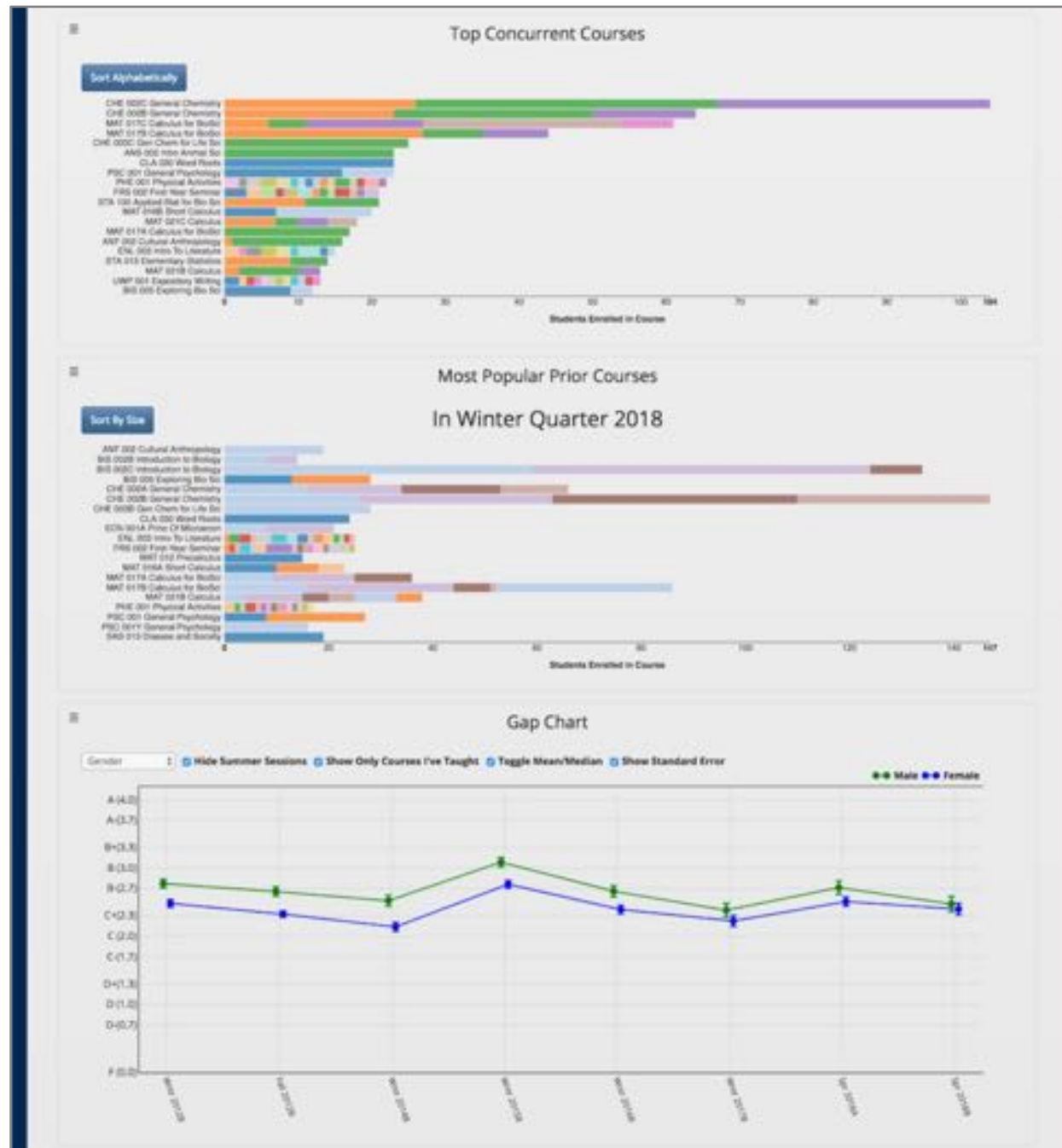
Faculty, campus professionals, campus services



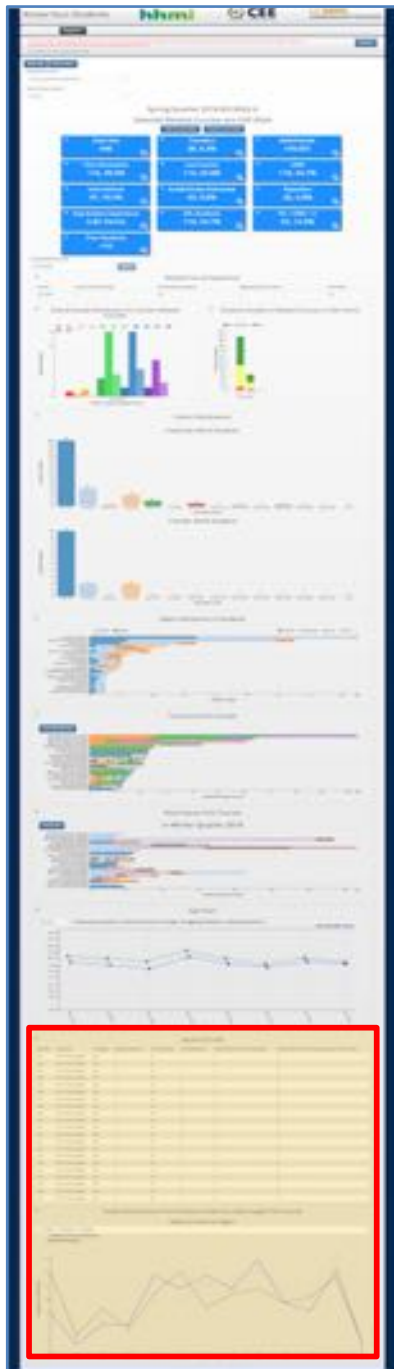
Know Your Students— UCD Experience and Majors



Know Your Students— Concurrent/Prior Courses and Gaps



Know Your Students— TAs, Grade Distributions



Know Your Students

Future Course Performance (past courses only – not predictions)



Enhancing Know Your Students data

New sources for greater understanding



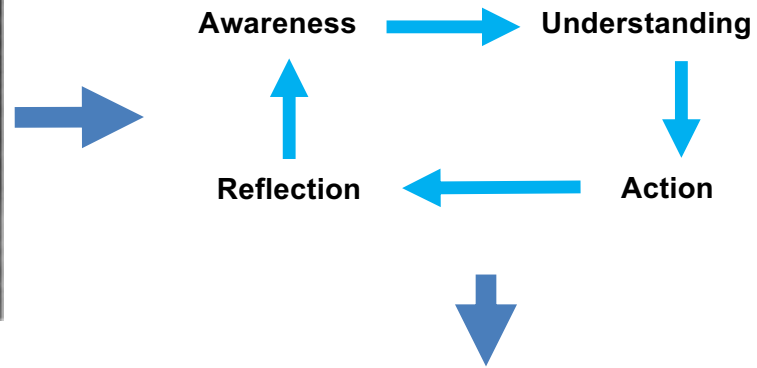
Instructional Exploration
& Data Gathering

Data Sources

- **DART, COPUS, LOPUS, Clicker use, LMS use**
- **Surveys - student check-in, time on task**
- **Teaching practices, inclusivity**
- **Bloom's analysis of learning objectives**
- **Student Course Evaluations (NLP)**
- **Use of campus tutoring resources**

Gradebook analysis for gaps (ESL) and targeted supports

Enhance Individuals to System Effectiveness Towards Students



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 Erin Becker
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 Haomiao Meng

+ Ideas and approaches from colleagues in:
 AAU, AAC&U, APLU, BVA, ALMAP, TEA, TRESTLE

SPECIAL THANKS to:
 Provost Hexter



Table Top Exercise WORKSHEET

- What data and information are most important? Is it available? What additional information would you find valuable?
- What strategies and approaches would you use to facilitate productive conversations within your department about these types of data?