

USF University Assessment Committee Series on Addressing Bias & Racism in Assessment

# ENGAGING CRITICAL QUANTITATIVE RESEARCH IN OUR ASSESSMENT PRACTICE

Desiree Zerquera, Ph.D.  
Associate Professor & Chair, Department of Leadership Studies, School of Education

November 2022

# HOW ARE YOU CURRENTLY USING QUANTITATIVE DATA IN YOUR WORK @ USF?



Using Dashboards in  
Tableau to understand  
trends



Personal Research Work



Learning Assessment in  
and/or out of the  
Classroom



Leading Conversations  
within Departments,  
Committees



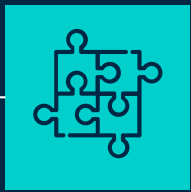
Through Program  
Review Work



Not really Yet  
Hoping to Better Do so  
Soon



# TODAY'S SESSION



01

## CHALLENGING TRADITION

Quantitative Research and Social Justice



02

## CQR & QUANTCRIT

Foundational Understandings for Challenging Tradition



03

## CRITICAL APPROACHES IN PRACTICE

Shared Principles & Examples

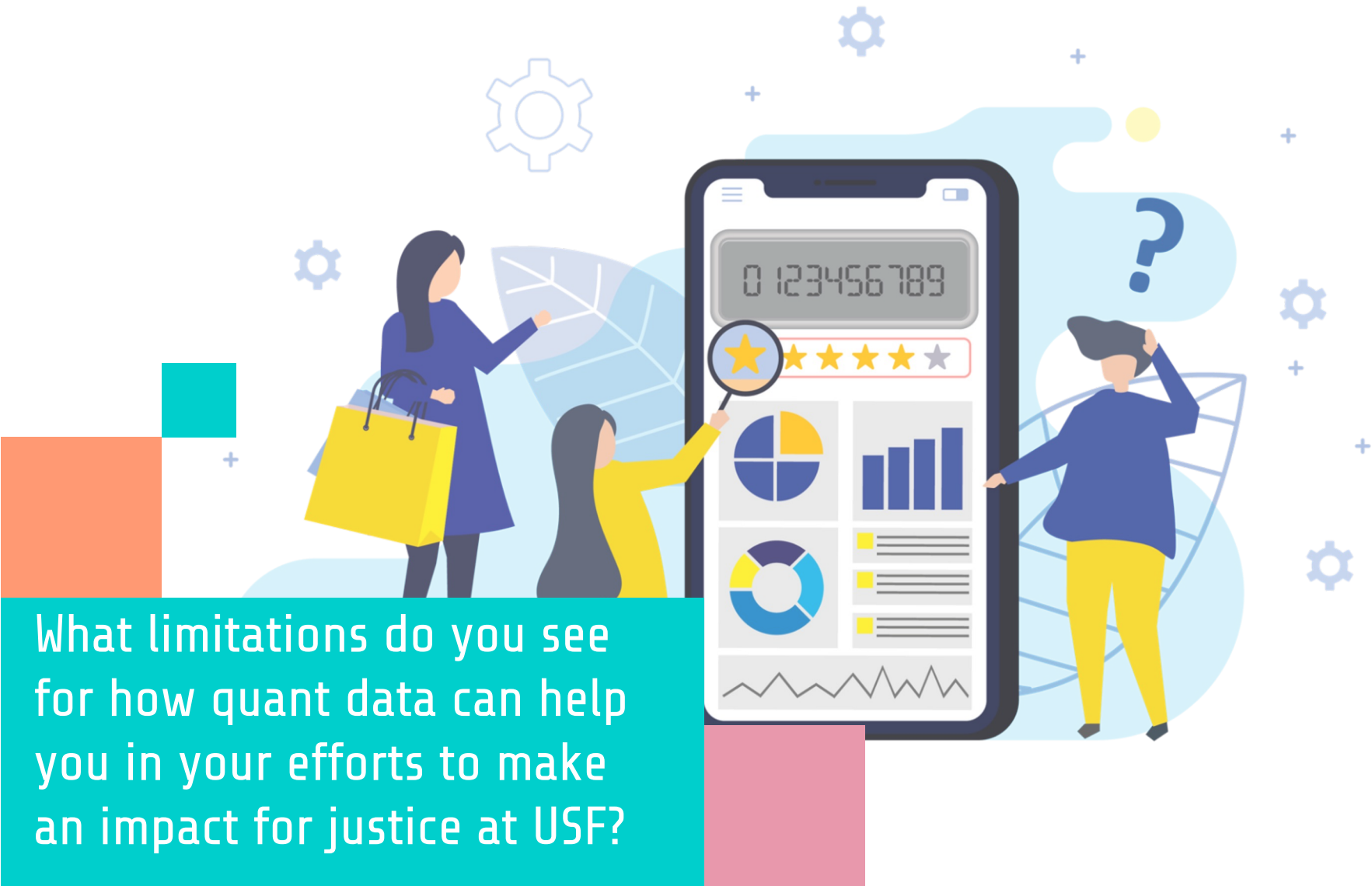


04

## MAKING PLANS WITHIN OUR OWN WORK



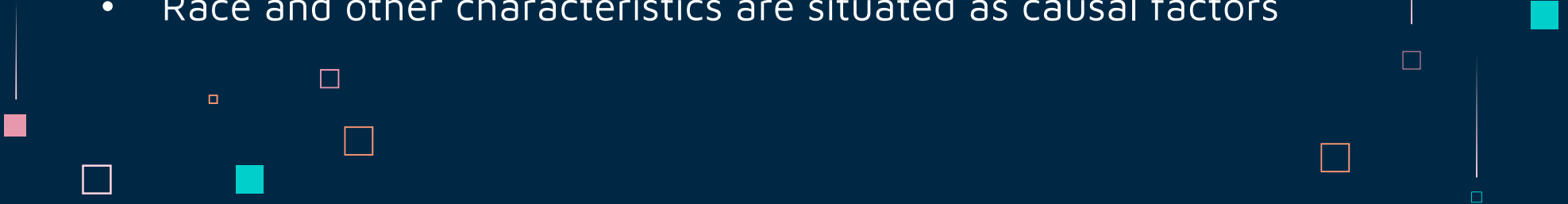
# Challenging Tradition: Quantitative Research and Social Justice



What limitations do you see for how quant data can help you in your efforts to make an impact for justice at USF?

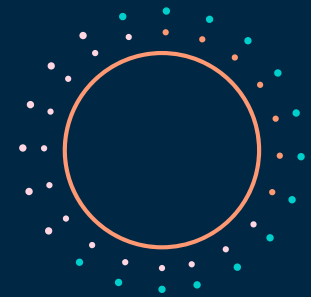
# Limitations of Standard Approaches to Quantitative Data Analysis


- Takes context of data collection for granted
- Homogenizes heterogeneous groups into oversimplified categories
- Statistical methods tend to justify stratification rather than challenge it
- Asterisks replace experiences of numerically smaller groups, rendering them invisible
- Race and other characteristics are situated as causal factors



# Implications of Limitations

- Situates underserved communities in position of *deficit*
- Pressure to use quantitative data exclusively
- Structures our thinking – ontological implications
- Numbers games are rigged against smaller populations





Critical Quantitative  
Research & Quant Crit:  
Challenging Traditional Notions of  
Quantitative Research





# Critical Quantitative Research & Quant Crit

## CQR

centered in critical theoretical paradigm broadly

“adapts a ***proactive stance by consciously choosing questions that seek to challenge...seeks to forge challenges, illuminate conflict, and develop critique*** through quantitative methods in an effort to move theory, knowledge, and policy to a higher plane.” (Stage, 2007, p. 8)

## QuantCrit

Draws explicitly from CRT

“Quantitative approaches cannot be adopted for racial justice aims without an ***ontological reckoning*** that considers historical, social, political, and economical power relations.” (Garcia, López, & Vélez, 2018))

# Critical Quantitative Research



- ask critical questions
- produce results that are linked to strategic and political actions and agendas
- ground in the historical and political context of the research questions and data
- examine systems of power and privilege
- critique current methods while proposing ways to modify them

(Baez, 2007; Covarrubias & Velez, 2013; Stage, 2007; St. John, 2007)

# Tenets of QuantCrit

- centrality of racism not easily quantified
- numbers are not neutral and promote deficit analyses
- categories are not natural
- voice and insight are vital
- statistical analyses have no inherent value but can play a role in struggles for social justice

Gillborn, Warmington, & Demack, 2018

The background is a dark blue gradient. It features several decorative elements: a vertical white line on the left with a cyan square at its base; a vertical white line in the upper center with a small orange square at its base; a vertical white line on the right with a cyan square at its base; a horizontal white line at the bottom with a cyan segment on the left and an orange segment on the right; a large solid blue square in the middle-right; a small pink square in the upper right; a small orange square in the middle right; and two small orange squares in the top right corner.

# Critical Approaches to Quantitative Statistics in Practice



# Shared Principles

For critical approaches to  
quantitative statistics in  
practice

Commit to anti-deficit framing of data

- Place institutional responsibility at the core of the work
- Race as indicator of relationships with power structures

Foreground and center *underserved* populations

- Identify opportunity gaps
- Foster unapologetic focus

Explore intersectional disaggregation

- Apply matrix of oppression to capture intersections
- Determine intentional disaggregation

Employ Critical creativity in data analysis

- Explore alternative ways of conducting & presenting analyses
- Include folks from marginalized populations in data collection and interpretation

Question the Data

- Evaluate context in which data collected
- Consider how data structured, what could change

# Institutional Data Capacity Framework

## Using Data to Inform Change

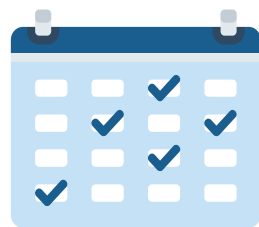
### Questions

Asking the Right Questions that lend themselves to being answered by data  
Shared responsibility across campus



### Answers

Finding the right answers to the questions you're asking  
Reflects strength of institutional data processes



### Meaning

Moving from information to knowledge  
Making data real and actionable at your institution



### Impact

Using data to inform decision-making and making necessary changes to impact results



The background is a dark blue field decorated with a sparse collection of geometric elements. These include small squares in various colors: light blue, orange, pink, and teal. Some squares are solid, while others are hollow. Additionally, there are several thin, vertical white lines of varying lengths scattered across the page, some appearing to be connected to the squares.

# EXAMPLES IN PRACTICE

## (re)Framing Data Questions

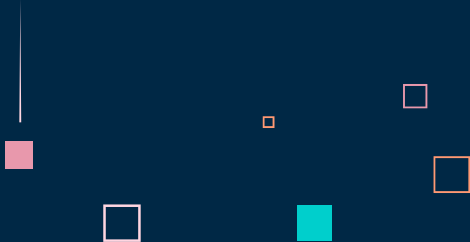
What are retention rates for first-year students, and how do these vary across demographic groups?

What programs are most effective in helping students overcome their barriers to success?

## Alternative Questions

Which students are *we* less likely to retain within their first year at our institution?

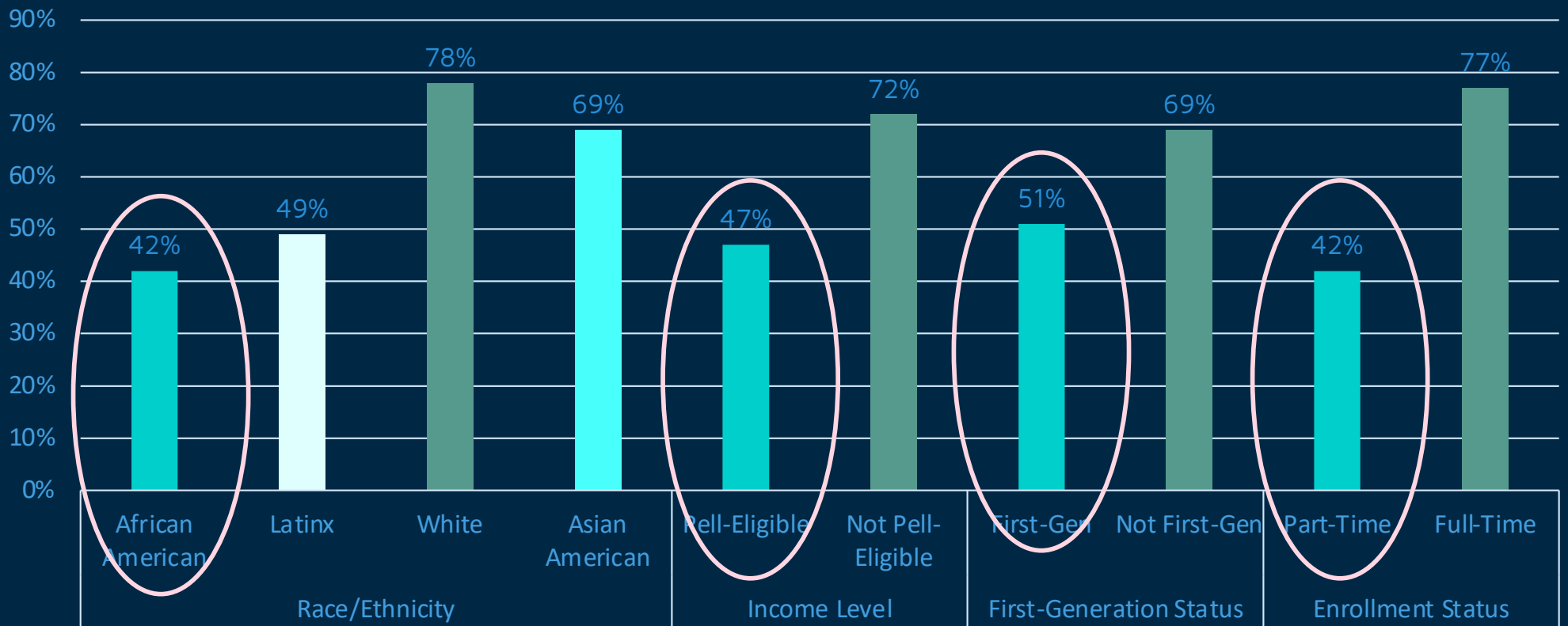
What barriers *do we present* during their first year that impedes their success?





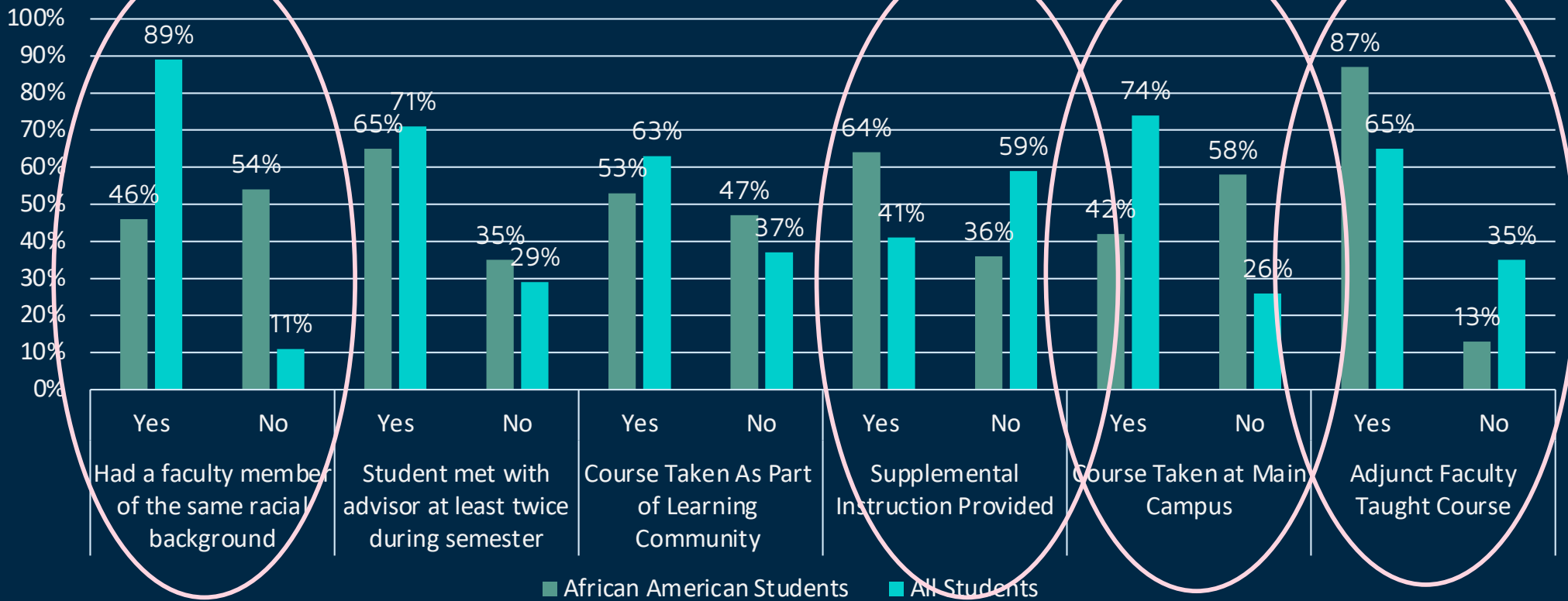
# Centering Responsibility for Student Outcomes

Success Rate in Math 101



# Centering Responsibility for Student Outcomes

## Better Understanding Students in Math 101



# Alternatives for Understanding Quantitative Data

Pacific Islander students are three times more likely to fail English courses than their White counterparts

## Alternative Approach

- We were more successful in supporting White students than Pacific Islander students to successful course completion in English courses

# Alternatives for Understanding Quantitative Data

The strongest predictors for student failing Mathematics courses was being African American, coming from a low-income household, and being in a course taught by part-time faculty

## Alternative Approach

- Across mathematics courses:
  - Low-income African American students are more likely to be in courses taught by part-time faculty
  - Success rates in courses taught by part-time faculty are significantly lower than those taught by full-time faculty
  - Just 20% of these courses are taught by full-time faculty

# Formulas for Re-Examining Performance

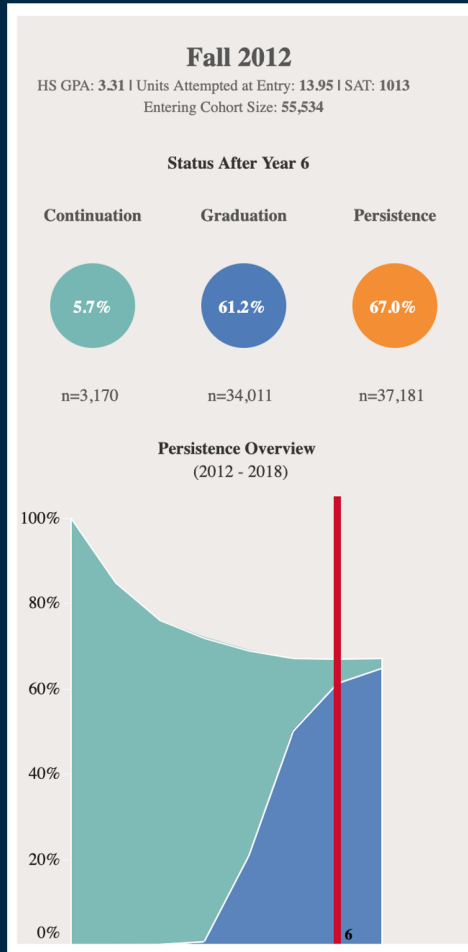
$$\text{Target Group's Equity Index for the educational outcome of interest} = \frac{\text{Target group with the educational outcome} \div \text{Total students with the educational outcome}}{\text{Target group in the reference population} \div \text{Total students in the reference population}}$$

Performance Level	Equity Index Value	Description
High Performance	Greater than or equal to 1	At or above equity
Medium-High Performance	$0.85 \leq \text{Equity Index} \leq 0.99$	Almost at equity
Medium-Low Performance	$0.70 \leq \text{Equity Index} < 0.85$	Below equity
Low Performance	Equity Index < 0.70	Far below equity

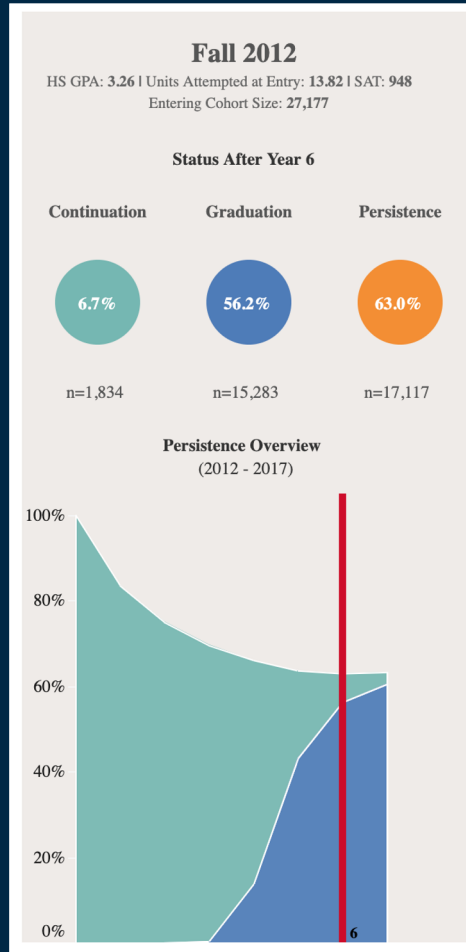
		Vital Sign		Current Performance									
Goal	Objective	Cohort	# or %	African American	American Indian - Alaska Native	Asian	Hispanic	Multi-Racial	Native HI/PI	Other-Unknown	Caucasian (White)	Int'l F-1 Visa	Total
Student Access and Success	Equitable Enrollment Rates	Fall 2017 Start Students	#	83	37	104	150	36	27	57	800	0	1294
			%	6.4%	2.9%	8.0%	11.6%	2.8%	2.1%	4.4%	61.8%	0.0%	100.0%
		Fall 2017 Start Degree-Seeking Students	#	53	28	82	106	28	21	31	565	0	914
			%	5.8%	3.1%	9.0%	11.6%	3.1%	2.3%	3.4%	61.8%	0.0%	100.0%
		Equity Index		0.90	1.07	1.12	1.00	1.10	1.10	0.77	1.00	#DIV/0!	1.00
		Fall 2017 Start Prof Tech Seeking Students	#	27	8	22	42	8	6	24	212	0	349
			%	7.7%	2.3%	6.3%	12.0%	2.3%	1.7%	6.9%	60.7%	0.0%	100.0%
		Equity Index		1.21	0.80	0.78	1.04	0.82	0.82	1.56	0.98	#DIV/0!	1.00
		Fall 2017 Start Transfer Seeking Students	#	52	28	79	105	28	21	31	563	0	907
			%	5.7%	3.1%	8.7%	11.6%	3.1%	2.3%	3.4%	62.1%	0.0%	100.0%
		Equity Index		0.89	1.08	1.08	1.00	1.11	1.11	0.78	1.00	#DIV/0!	1.00
		Fall 2017 Start STEM Seeking Students	#	9	5	10	19	5	2	7	104	0	161
			%	5.6%	3.1%	6.2%	11.8%	3.1%	1.2%	4.3%	64.6%	0.0%	100.0%
		Equity Index		0.87	1.09	0.77	1.02	1.12	0.60	0.99	1.04	#DIV/0!	1.00
	Fall 2017 Faculty/Staff to Students ratio	#	33	13	51	23	40	11	10	794	0	975	
		%	3.4%	1.3%	5.2%	2.4%	4.1%	1.1%	1.0%	81.4%	0.0%	100.0%	
	Equity Index		0.53	0.47	0.65	0.20	1.47	0.54	0.23	1.32	#DIV/0!	1.00	
	Equitable Access to College-Level Courses	Fall 2017 Start Students enrolled in College-Level Math	#	19	9	24	35	8	7	13	185	0	300
			%	6.3%	3.0%	8.0%	11.7%	2.7%	2.3%	4.3%	61.7%	0.0%	100.0%
		Equity Index		0.99	1.05	1.00	1.01	0.96	1.12	0.98	1.00	#DIV/0!	1.00
Fall 2017 Start Students enrolled in College-Level English		#	19	9	24	35	8	7	13	185	0	300	
		%	6.3%	3.0%	8.0%	11.7%	2.7%	2.3%	4.3%	61.7%	0.0%	100.0%	
Equity Index			0.99	1.05	1.00	1.01	0.96	1.12	0.98	1.00	#DIV/0!	1.00	

# Graduation & Continuation Rates | First-Time, Full-Time Freshmen @ CSUs

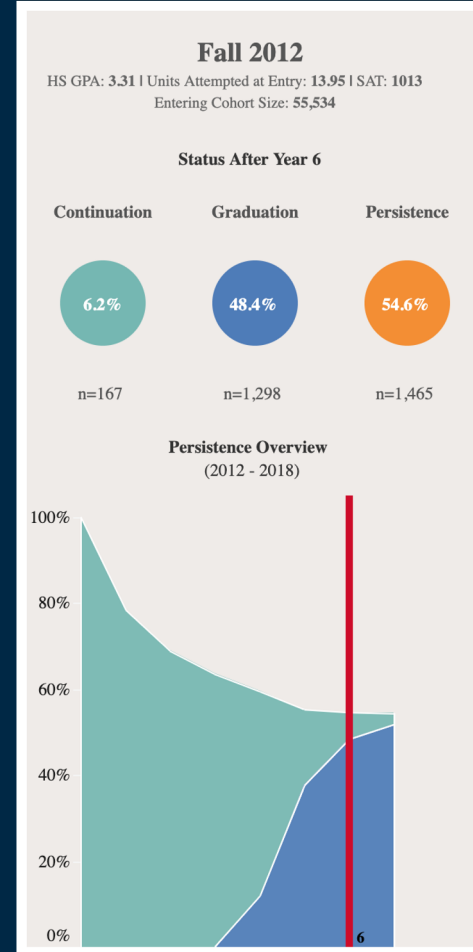
## All Students



## Pell Recipients

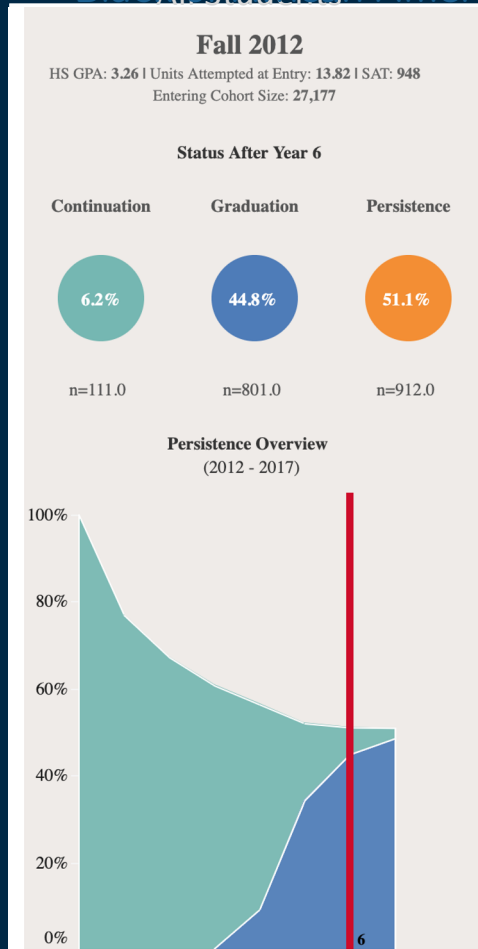


## Black or African American Students



# Graduation & Continuation Rates | First-Time, Full-Time Freshmen @ CSUs

All Students | Black or African American Pell Recipients | Black or African American Students



With regards to Black or African American Pell Recipients, CSU campuses

- graduated these students **11.4% points lower** than all Pell recipients
- graduated these students **3.7% points lower** than all Black or African American students
- retained these students at a rate that was **11.9% lower** than all Pell recipients
- retained these students at a rate that was **3.5% lower** than all Black or African American students



# Analyzing Data: Percentage Point Gap

## *The RP Group*

**Percentage Point Gap** = % outcome for students in subgroup – % outcome for all students

Table 1. Course Success Rates by Ethnicity and Percentage Point Gap Value

Ethnic Group	Cohort Count	Outcome Count	Success Rate (Per Group)	MOE Threshold	Point Gap Value
<b>African American</b>	<b>2,547</b>	<b>1,388</b>	<b>54.50%</b>	<b>-3%</b>	<b>-11.8</b>
American Indian	213	144	67.61%	-7%	+1.3
Asian	9,834	7,166	72.87%	-3%	+6.6
Hispanic	35,055	22,304	63.63%	-3%	-2.7
Multi Ethnic	2,261	1,468	64.93%	-3%	+1.4
<b>Pacific Islander</b>	<b>286</b>	<b>153</b>	<b>53.50%</b>	<b>-6%</b>	<b>-12.8</b>
White	16,696	11,878	71.14%	-3%	+4.8
<b>Unknown</b>	<b>2,508</b>	<b>1,509</b>	<b>60.17%</b>	<b>-3%</b>	<b>-6.1</b>
<b>Total</b>	<b>69,400</b>	<b>100%</b>	<b>66.30%</b>		

# Exploring Outcomes by Different Disaggregation Categories

## Retention of First-Generation in College Students

		First-Generation in College	Not First-Generation in College
Hispanic Latinx	Not Retained	26.3%	23.1%
	Retained	73.7%	76.9%
Non-Hispanic Latinx	Not Retained	28.6%	24.9%
	Retained	71.4%	75.1%

		First-Generation in College	Not First-Generation in College
Black African American	Not Retained	29.3%	28.1%
	Retained	70.7%	71.9%
Not Black African American	Not Retained	26.3%	22.0%
	Retained	73.7%	78.0%

# Exploring Outcomes by Different Disaggregation Categories

## Retention: Hispanic/Latinx Students by Nationality

	Proportion of Total Hispanic/Latinx Population	Not Retained	Retained
Overall Hispanic/Latinx Population		26.60%	75.40%
ARGENTINA	1.3%	24.0%	76.0%
BOLIVIA	0.2%	44.4%	55.6%
BRAZIL*	1.5%	35.6%	64.4%
CHILE	0.2%	11.1%	88.9%
COLOMBIA	5.2%	29.0%	71.0%
COSTA RICA	0.3%	18.2%	81.8%
CUBA	2.4%	28.0%	72.0%
DOMINICAN REPUBLIC	1.9%	18.3%	81.7%
ECUADOR	1.0%	24.3%	75.7%
SPAIN*	0.2%	0.0%	100.0%
GUATEMALA	0.4%	21.4%	78.6%
HONDURAS	0.9%	30.6%	69.4%
MEXICO	0.8%	20.0%	80.0%
NICARAGUA	0.7%	50.0%	50.0%
PANAMA	0.3%	45.5%	54.5%
PERU	2.3%	20.2%	79.8%
PUERTO RICO	1.9%	27.8%	72.2%
PARAGUAY	0.1%	25.0%	75.0%
EL SALVADOR	0.4%	28.6%	71.4%
UNITED STATES OF AMERICA	71.3%	23.3%	76.7%
URUGUAY	0.0%	100.0%	0.0%
VENEZUELA	6.6%	29.0%	71.0%

# Exploring Outcomes by Different Disaggregation Categories

## Retention: Black or African American Students by Nationality

	Proportion of Total Black/ African American Population	Not Retained	Retained
Overall Black African American Population		28.7%	71.3%
BAHAMAS	0.2%	33.3%	66.7%
HAITI	2.7%	24.4%	75.6%
JAMAICA	1.8%	24.3%	75.7%
TRINIDAD & TOBAGO	0.1%	30.0%	70.0%
United States	22.8%	29.6%	70.4%

The background is a dark navy blue. It features several abstract elements: a vertical white line on the left with a small cyan square at its base; a vertical white line in the upper center with a small white square at its base; a vertical white line on the right with a small cyan square at its base; a horizontal white line at the bottom with a purple segment on the left and an orange segment on the right; a large purple square in the center-right; a small pink square in the upper right; a small orange square in the middle right; a small white square in the top right; and a small cyan square in the middle right.

# Making Plans within Our Own Work

# Reflections & Applications to Our Own Work

## Possibilities and Plans



### Practice in the Classroom

What did you learn from this process that you can apply to your teaching practice?



### Decisions in Departments

How can these learnings inform decisions across the curriculum?

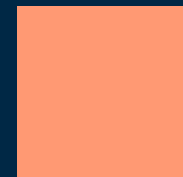
### Campus Engagement

How can you impact the broader campus through your role on committees and in other spaces?



### Using Data

How can you more strongly incorporate data into your work?



## Some References

- Nancy López, Christopher Erwin, Melissa Binder & Mario Javier Chavez (2018) Making the invisible visible: advancing quantitative methods in higher education using critical race theory and intersectionality, *Race Ethnicity and Education*, 21:2, 180-207
- Gillborn, D., Warmington, P., & Demack, S. (2018). QuantCrit: education, policy, 'big data' and principles for a critical race theory of statistics. *Race Ethnicity and Education*, 21(2), 158–179.

