



Research and Data: Driving Dialog and Decision Making

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Faculty Leadership Institute, Sheraton Grand Sacramento
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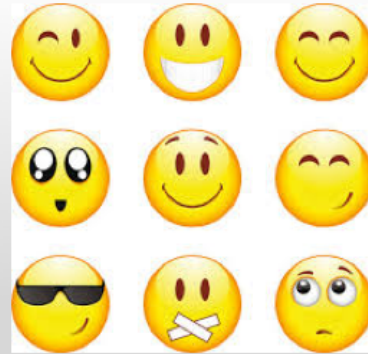
Description

Now more than ever, decisions for programs and processes at our colleges are to be based on data. This is a challenge, especially in institutions where research offices are understaffed. In addition, being a faculty leader does not necessarily imply having a strong research background. Join us for a lively discussion on what to look for and what to look out for when your academic senate is provided with research and data for dialog and recommendations on important issues affecting the college and especially the students.

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Overview

- A Brief Research and Data Tutorial
- What to look for, and look out for!
- Let's try it out...
- Questions and Comments



A Brief Research and Data Tutorial

Data

- What does it mean for two statistics to be the same or different?
- What is Quantitative Data vs. Qualitative Data?
- What is the difference between Correlation and Causation? Does it even matter?
- Do you know the following?
 - Mean
 - Median
 - Mode
 - Variance
 - Standard Deviation
 - Correlation Coefficient
 - Statistically Significant



Use example of stepping on scale everyday, while it may vary from day to day or even week to week, when is there a real change?

Research

- Who is presenting the data and conclusion and what is their interest?
- Follow the money...who is paying for the research?
- Sound research should be based on a desire to answer a question. Be prepared for answers you may not be hoping for...

Use example of stepping on scale everyday, while it may vary from day to day or even week to week, when is there a real change?

**What to look for and what
to look out for!**

Correlation vs Causation It's Complicated!



Correlation led to finding Causation

Smoking cigarettes causes lung cancer: For years tobacco companies tried to cast doubt on the link between smoking and lung cancer, often using “correlation is not causation!” type propaganda. However,

- There are cases of lung cancer in people that never smoked!
- There are people that have smoked that never developed lung cancer.

An actual link was found...

- <https://www.cancer.org/latest-news/the-study-that-helped-spur-the-us-stop-smoking-movement.html>
- <https://health.usnews.com/health-care/patient-advice/articles/2017-06-13/how-smoking-causes-lung-cancer>

Fun examples to use in professional development to help the college community understand a little about the complexities of statistical analyses.

More complicated reasons for correlation...

Hypothesis: Vending machines in schools are a cause of obesity.

Eating extra junk food leads to obesity.

Vending machines generally have junk food.

Many schools have vending machines.

Solution: Remove vending machines from schools to reduce obesity.

Longitudinal study: It was found that kids who moved from schools without vending machines to schools with vending machines didn't gain weight. Yet, there was well published evidence of correlation between obesity and vending machines in schools:

It turns out the causal relationship is convoluted enough that removing the vending machines didn't actually fix the issue, but people felt like they were doing something to address the issue.

- http://www.asanet.org/sites/default/files/savvy/press/SOE_January2012_Van_Hook_Press_Release.pdf
- <https://www.cbsnews.com/news/school-vending-machine-laws-would-help-kids-lose-weight-study-shows/>.

Lurking variables...What might they be?

The following are examples of strong correlation caused by a lurking variable:

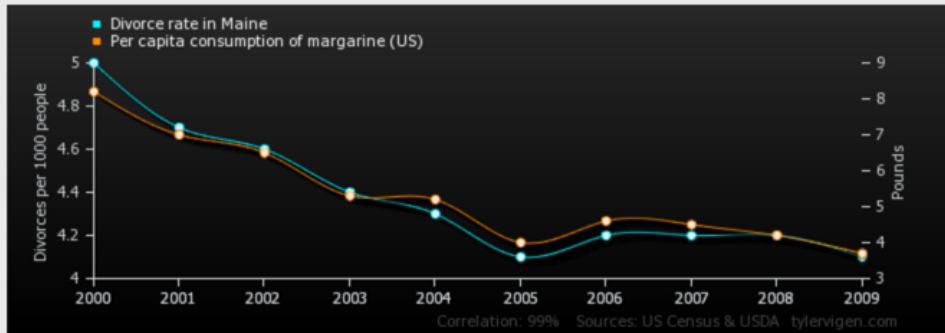
- The average number of computers per person in a country and that country's average life expectancy.
- The number of firefighters at a fire and the damage caused by the fire.
- The height of an elementary school student and his or her reading level.



And then there is just some silliness...



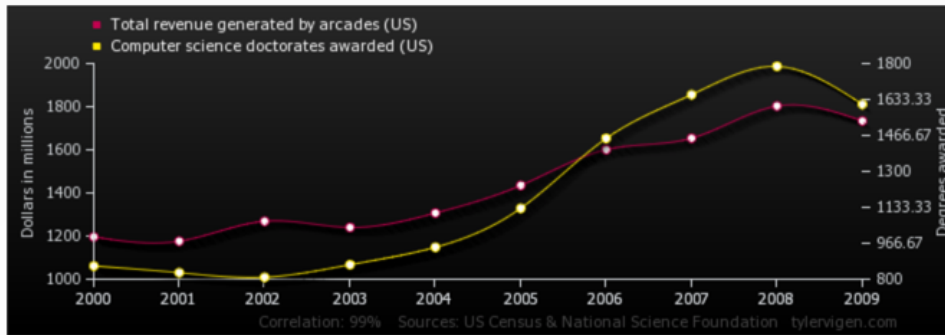
Divorce rate in Maine correlates with Per capita consumption of margarine (US)



[Upload this chart to imgur](#)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<i>Divorce rate in Maine</i> Divorces per 1000 people (US Census)	5	4.7	4.6	4.4	4.3	4.1	4.2	4.2	4.2	4.1
<i>Per capita consumption of margarine (US)</i> Pounds (USDA)	8.2	7	6.5	5.3	5.2	4	4.6	4.5	4.2	3.7
Correlation: 0.992558										

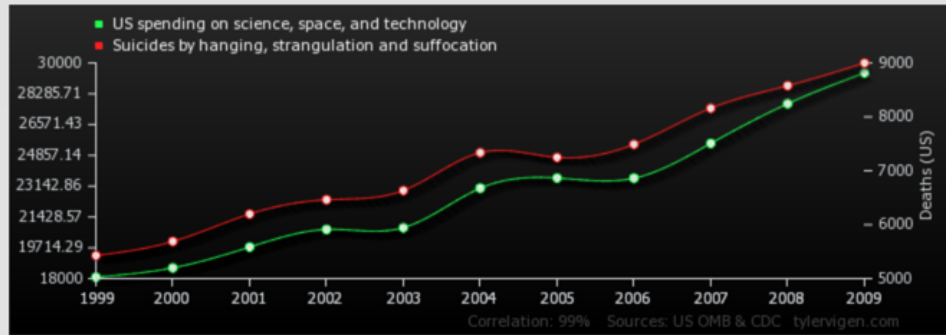
Total revenue generated by arcades (US) correlates with Computer science doctorates awarded (US)



[Upload this chart to imgur](#)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Total revenue generated by arcades (US) <i>Dollars in millions (US Census)</i>	1,196	1,176	1,269	1,240	1,307	1,435	1,601	1,654	1,803	1,734
Computer science doctorates awarded (US) <i>Degrees awarded (National Science Foundation)</i>	861	830	809	867	948	1,129	1,453	1,656	1,787	1,611
Correlation: 0.985065										

US spending on science, space, and technology correlates with Suicides by hanging, strangulation and suffocation



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<i>US spending on science, space, and technology Millions of todays dollars (US OMB)</i>	18,079	18,594	19,753	20,734	20,831	23,029	23,597	23,584	25,525	27,731	29,449
<i>Suicides by hanging, strangulation and suffocation Deaths (US) (CDC)</i>	5,427	5,688	6,198	6,462	6,635	7,336	7,248	7,491	8,161	8,578	9,000

Correlation: 0.992082

Let's take a quick brain overload
on some data...



Students Enrollment by Unit Load –

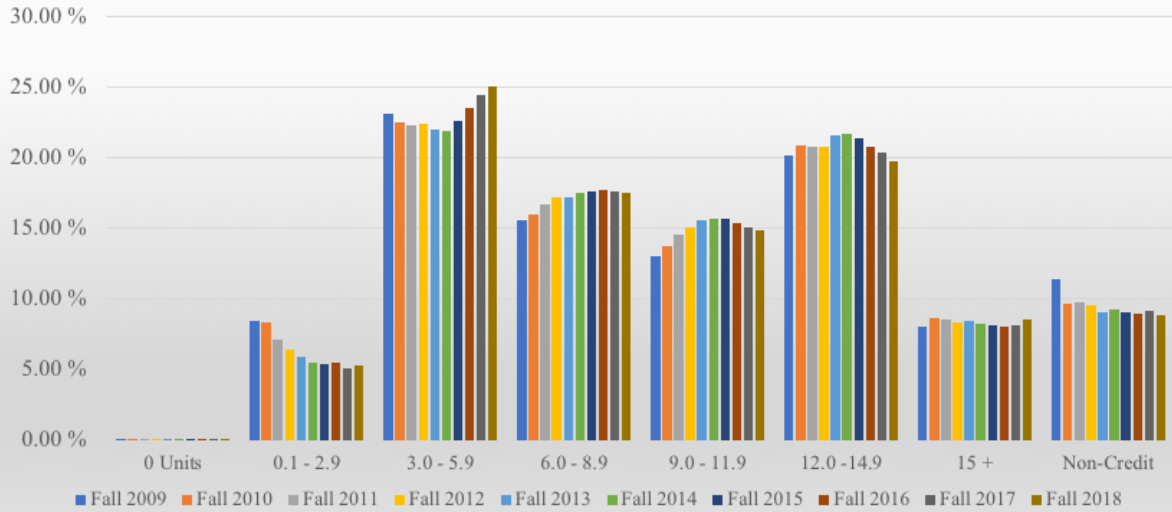
(recent 10 years) datamart.cccco.edu

	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017	Fall 2018
0 Units	0.01 %	0.01 %	0.01 %	0.01 %	0.01 %	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %
0.1 - 2.9	8.43 %	8.37 %	7.14 %	6.48 %	5.95 %	5.54 %	5.39 %	5.53 %	5.12 %	5.31 %
3.0 - 5.9	23.16 %	22.55 %	22.37 %	22.40 %	22.00 %	21.94 %	22.66 %	23.56 %	24.50 %	25.06 %
6.0 - 8.9	15.60 %	16.04 %	16.69 %	17.21 %	17.28 %	17.51 %	17.61 %	17.71 %	17.64 %	17.57 %
9.0 - 11.9	13.09 %	13.78 %	14.62 %	15.13 %	15.64 %	15.70 %	15.66 %	15.35 %	15.11 %	14.86 %
12.0 -14.9	20.22 %	20.85 %	20.79 %	20.80 %	21.56 %	21.73 %	21.41 %	20.79 %	20.36 %	19.82 %
15 +	8.02 %	8.70 %	8.57 %	8.38 %	8.50 %	8.28 %	8.15 %	8.06 %	8.12 %	8.53 %
Non-Credit	11.46 %	9.71 %	9.81 %	9.59 %	9.07 %	9.30 %	9.12 %	8.99 %	9.14 %	8.85 %
Unknown	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %

Is the point here about the number of part-time students?

Students Enrollment by Unit Load –

(Fall 2009 – Fall 2018) datamart.cccco.edu



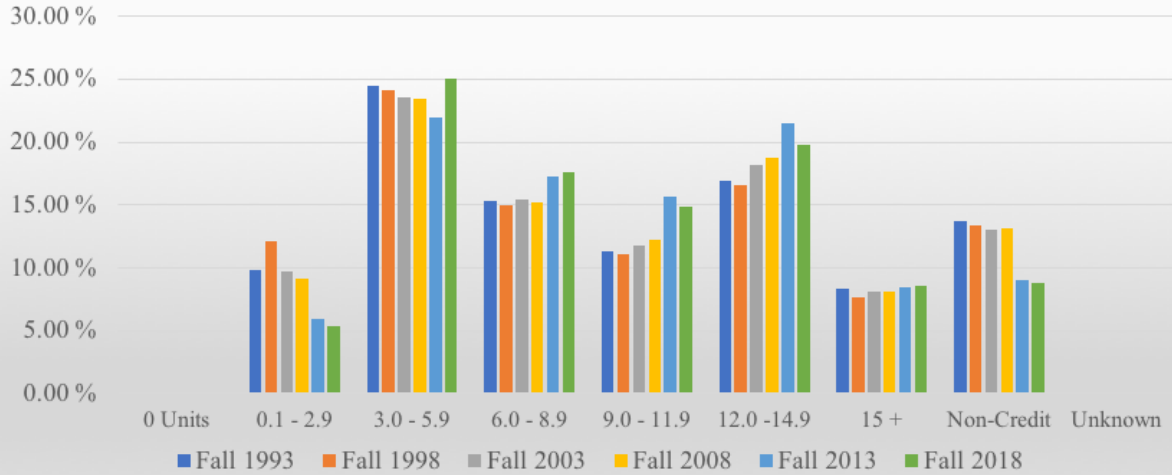
Students Enrollment by Unit Load –

(25-year span, 5-year increments) datamart.cccco.edu

	Fall 1993	Fall 1998	Fall 2003	Fall 2008	Fall 2013	Fall 2018
0 Units	0.11 %	0.10 %	0.14 %	0.02 %	0.01 %	0.00 %
0.1 - 2.9	9.83 %	12.17 %	9.68 %	9.15 %	5.95 %	5.31 %
3.0 - 5.9	24.48 %	24.09 %	23.60 %	23.40 %	22.00 %	25.06 %
6.0 - 8.9	15.28 %	14.97 %	15.42 %	15.19 %	17.28 %	17.57 %
9.0 - 11.9	11.27 %	11.04 %	11.80 %	12.26 %	15.64 %	14.86 %
12.0 -14.9	16.89 %	16.60 %	18.18 %	18.80 %	21.56 %	19.82 %
15 +	8.36 %	7.63 %	8.13 %	8.08 %	8.50 %	8.53 %
Non-Credit	13.77 %	13.40 %	13.05 %	13.10 %	9.07 %	8.85 %
Unknown	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %

Students Enrollment by Unit Load –

(Fall 1993 – Fall 2018) datamart.cccco.edu

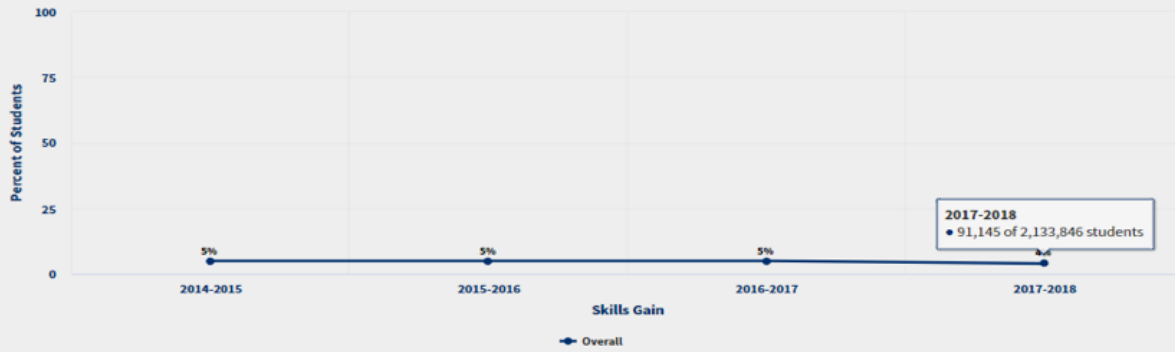


Skills Gains – CB21/EFL

LEARNING PROGRESS

Skills Gains

Among all students, the percentage who had one or more skills gains, measured by advancing one or more CB21 levels or by improving one or more educational functioning levels in the selected year



(Hover for Detailed Information)

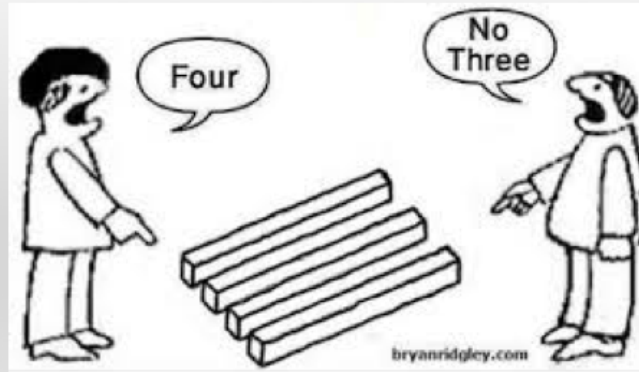
Source: Chancellor's Office Management Information System

[Technical Definition](#)

What about 2019/20?

- Data Collection needs to begin now:
 - Two-year timeline passes quickly
 - Analyze first set during spring 2020
- Faculty and Curriculum Committees need to be nimble and flexible in order to be responsive to curricular and programmatic changes to meet student learning needs
- Faculty and Researchers need to work together – What is the process at your college for faculty and researchers to consider data collection needs?
- How does AB 705 Implementation fit in a Guided Pathways framework?
- How does the Student Centered Funding Formula (performance funding) fit in a Guided Pathways framework?

How do you create a joint definition of success?



It matters how you look at it!

Let's try it out...

Scenario I

The Student Equity and Achievement Committee is recommending that the college consider funding a targeted intervention for Native American students taking English 1A. The data shows that since the accelerated English program began last year, the success rate of students identifying as Native American in English 1A has dropped by 20%.

Considerations:

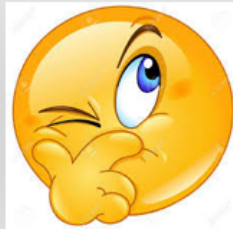
- Sample size
- No longitudinal data (only since last year)
- What is meant by “dropped by 20%”?
- Other?

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Scenario II

Your Academic Senate is presented with information that about half of students that apply to California community colleges actually enroll (graph on next slide). Your administration is concerned that more can be done to keep from losing the students that don't enroll.

What questions do you have after viewing the next slide?



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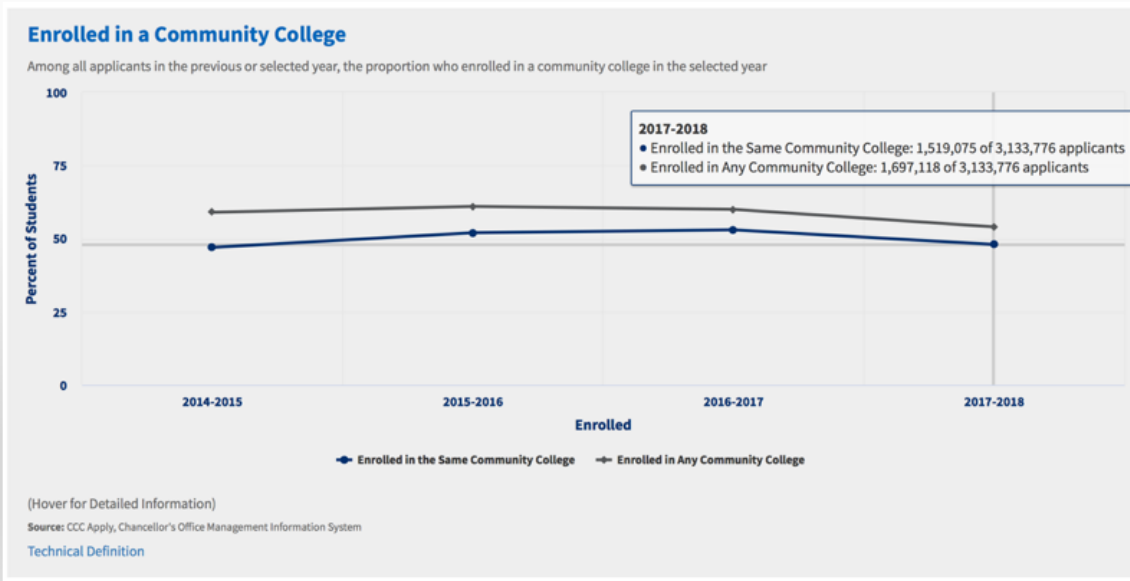
Who is in the denominator?

Many high schools have all students apply for the community college.

Has your college had staff apply to see what the process is like for students?

Students apply to CCC often as a "safety" school.

Scenario II



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Who is in the denominator?

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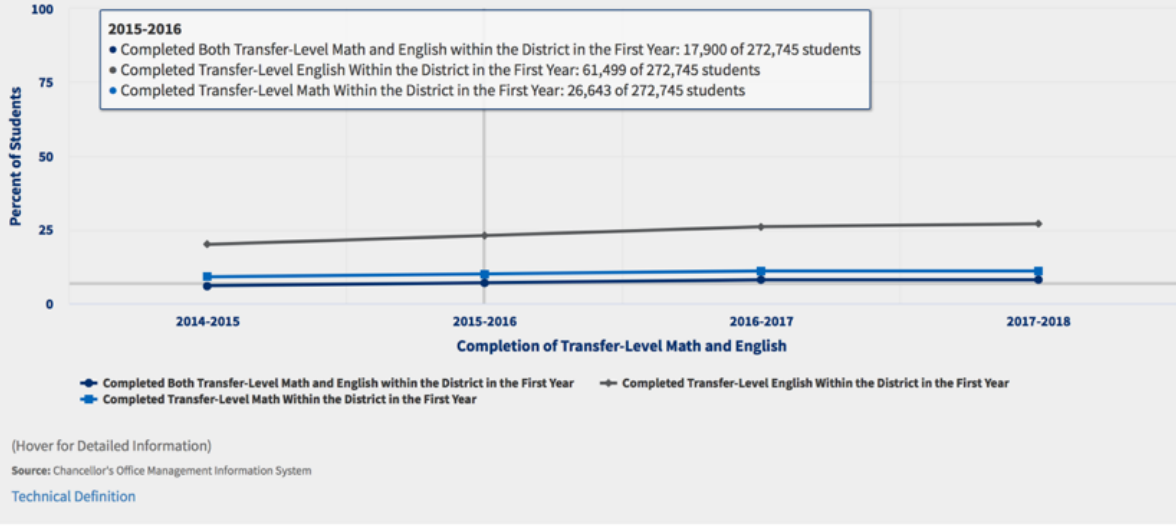
Has your college had staff apply to see what the process is like for students?

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Scenario III

Completed Transfer-Level Math and English

Among all students, the proportion who completed transfer-level math and English in their first academic year of credit enrollment within the district



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Both – 6.6%

English – 22.5%

Math – 9.8%

Scenario III

Statewide

[Click here to select a different college](#)

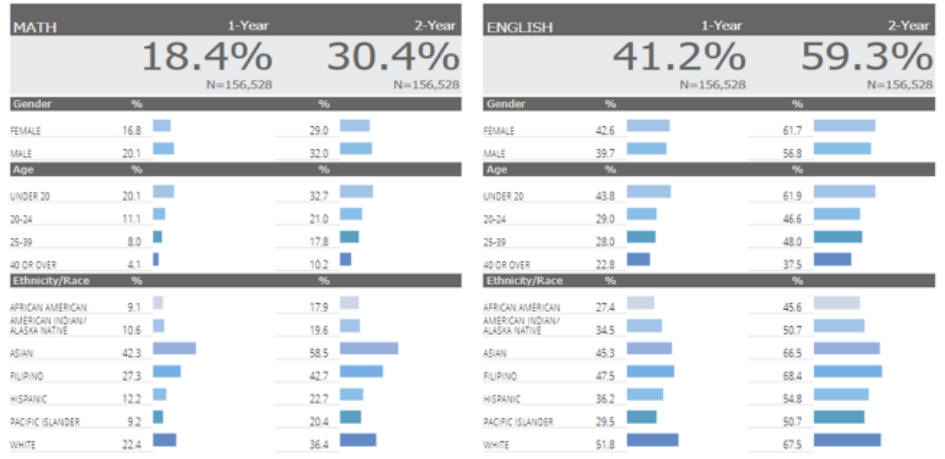
CURRENT PROFILE **Math & English/ESL Metrics** Completion Metrics CTE Metrics
 Remedial/ESL **Transfer Level Achievement** Persistence 30 Units Degree/Transfer CTE Skills Builder CDCP

[View Rates](#) [Metric Profile](#)

Transfer Level Achievement

[Click here to view trend data](#)

The percent of first-time students in 2015-16 who complete 6 units and attempt any Math or English in their first year who complete a transfer-level course in Math or English in their first or second year.



0%: Cohort with no students attaining an outcome
 N/A: Cohort has no students
 *: Cohort fewer than 10 students

- The definitions here are different from the previous slide...
- What is being counted?
- What is NOT being counted?
- What other questions should you ask?

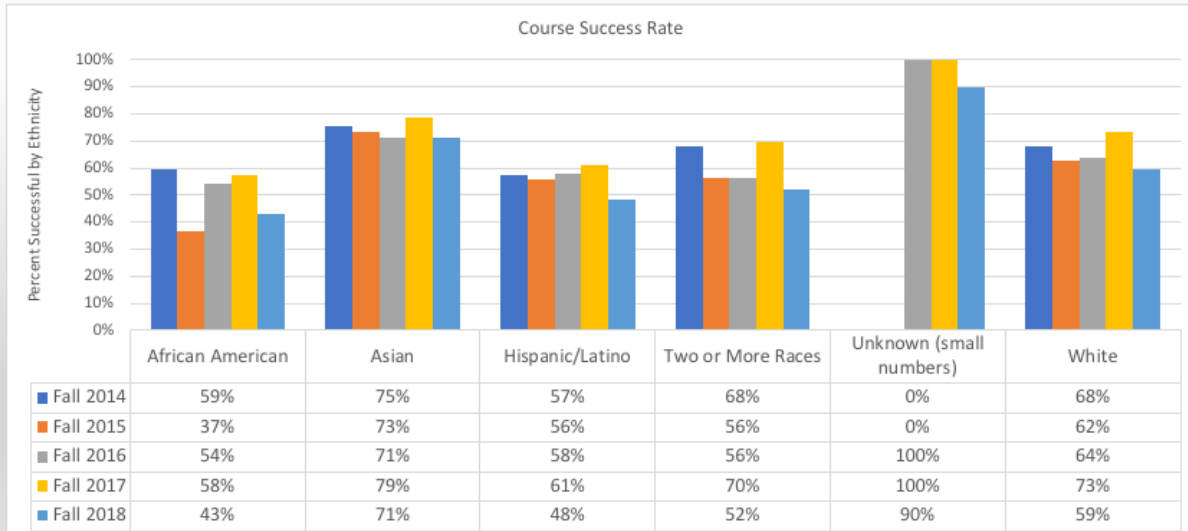
Classes that meet same requirements taught outside of discipline or with different TOP code

Are all students required to complete transfer-level math?

Scenario IV

A Snapshot of One College

MMAF in 2014, MMAF 2.0 in 2017, AB 705 in 2018



At this college, the throughput increased in 2018, enrollment declined, pass rates declined...WHY?

Questions/Comments



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Resources

Student Success Metrics:

<https://www.calpassplus.org/LaunchBoard/Student-Success-Metrics>

CCCCO MIS Data Mart:

<https://datamart.cccco.edu/DataMart.aspx>

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