The Art and Heart of Data Disaggregation: Exploring Students’ Complex Identities

An IEPI Workshop
October 13, 2017
Strengthening Student Success
Burlingame, California
Overview of the workshop

• Introductions
  – Who are we and what are going to accomplish today?
  – Who are you and what do you hope to accomplish today?
• Storytelling with data
  – The Butte College Story
• Data work
  – Pearl diving
  – Communicating & the power of the visual
• Complex identities and equity planning
Finding the heartbeat

THE BUTTE COLLEGE STORY
Finding the heartbeat at Butte
Making the case

Ownership & Reason
What is F.A.I.R. Classrooms?
By the conclusion of this program, participants will:

• **Create a community** dedicated to reducing equity gaps through evidence-based inquiry and practices

• **Become aware** of equity gaps in their own classrooms

• **Inquire** into their instructional practice to **identify and/or respond** to potential contributing factors to these gaps

• **Identify, create, and share tools** and materials that support these processes
F.A.I.R. Classrooms
Faculty Alliance for Inquiry and Research

EQUITY-MINDEDNESS
A Critical Disturbance

- Organizational change theory
  - A gap between your intent and your impact
  - E.G., Implicit bias & microaggressions

- Before anyone sees data, we ask people what their values are:
  - I hope I’m being fair, I hope I’m helping people succeed.
  - When you see a lifetime of student data disaggregated and it contradicts those values, assumptions, and lore
<table>
<thead>
<tr>
<th>Population or Group</th>
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<tbody>
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Name and gender of subgroup | Number of enrollments and successes | Success rate by group | Success rate for all students | Size of gap | Is it an equity gap?

Participate | Collaborate | Innovate
### INSTRUCTOR NAME:

Includes: Fall 2005 - Spring 2016

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</table>
Pearl Diving

Degree of Impact

Group size

Number Needed to Close the Gap
Diving for Pearls

Size of group, percentage gap, & number needed to close gap

-30%  -25%  -20%  -15%  -10%  -5%  0%  5%  10%  15%  20%

Participate  |  Collaborate  |  Innovate
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What parts of the FAIR Classrooms program have been most valuable for you?

“Raised awareness... receiving my data and being able to reflect on how my practice impacts students.. Sometimes I feel so ‘alone’ when thinking about my concerns about education – it’s comforting to know that there is a community of teachers and researchers.”

“It is changing how I think! Not just with respect to teaching – but how I relate across campus being a faculty member on various academic committees!”
CRAFTING POWERFUL, PERSUASIVE PRESENTATIONS
How often do you use presentation software, such as PowerPoint, when you present?

- Never: 53%
- Sometimes: 24%
- Usually: 24%
- Pretty much all the time: 53%

When poll is active, respond at PollEv.com/craighayward694
Text CRAIGHAYWARD694 to 22333 once to join
What one word or phrase captures how you usually feel about presenting to an audience?

Respond at PollEv.com/craighayward694

Text CRAIGHAYWARD694 to 22333 once to join, then text your message
How often do you use presentation software, such as PowerPoint, when you present?

When poll is active, respond at PollEv.com/craighayward694
Text CRAIGHAYWARD694 to 22333 once to join

- Never: 24%
- Sometimes: 24%
- Usually: 24%
- Pretty much all the time: 53%
Power corrupts absolutely.

Edward Tufte
DEATH BY POWERPOINT

https://www.youtube.com/watch?v=jFfFQ9XU7Jw

https://www.youtube.com/watch?v=BP8gSqBmpkE
You are the presentation.

Slides are your visual aid.
Quick tips

PRESENTING WITH PASSION
So many presentations? Why?

One more thing...
Why do we present?
“It’s people...[data] is made out of people!”

STORYTELLING WITH DATA
Conflict!
Elements of a story

- Characters
  - Good guys/Heroes
  - Bad guys/Villains
- Setting
- Plot
  - Conflict
  - Resolution
Engage with the data

TELL YOUR STORY
Now tell your story...

Archetypes
• Heroes
• Villains
• Conflict/Drama
• Climax
• Resolution

Who are your local actors
• Faculty
• Inequity, Systemic Barriers
• Revealing DI in your data
• Conflict with core values
• Your path to equity & success
• Where do students fit in to the story?
Practical exercise

• Now create some visualizations that help you find the data pearls that will be the focus of your own data story
• How do different visualizations emphasize or minimize certain perspectives?
• Would some disproportionately impacted subgroups be hidden or ignored if they weren’t disaggregated?
• What are the stories behind these nuanced impacts?
UNDERSTANDING COMPLEX STUDENT IDENTITIES – MULTIVARIATE DISAGGREGATION
Data Disaggregation Process

1. Identification of Outcome
2. Outcome Data for All Groups Combined
3. Aggregated Data
   - Examples: Course Success Rates, Transfer Rate
4. Bivariate Disaggregated Data
   - Age
   - Gender
   - Foster Youth Status
Disaggregated Data (Univariate)

Mean Success Rates by Foster Youth Status at College of Marin (FA 12 and FA 13)

Foster Youth Status

- Yes: 54.68%
- No: 72.33%

Participate | Collaborate | Innovate
Disaggregated Data (Univariate)

Mean Success Rates by Gender at College of Marin (FA 12 and FA 13)

- **Males**: Mean Success Rate = 67.54%
- **Females**: Mean Success Rate = 75.24%
Disaggregated Data (Multivariate) – Interaction Present

Mean Success Rates by Foster Youth Status and Gender at College of Marin (FA 12 and FA 13)

Foster Youth Status by Gender

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>42.3</td>
<td>62.7</td>
</tr>
<tr>
<td>No</td>
<td>68.1</td>
<td>75.5</td>
</tr>
</tbody>
</table>
### Mean Success Rates by Foster Youth Status and Gender

<table>
<thead>
<tr>
<th>Foster Youth Status</th>
<th>Male</th>
<th>Female</th>
<th>Gender Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foster Youth</td>
<td>42.3%</td>
<td>62.8%</td>
<td>20.5%</td>
</tr>
<tr>
<td>Non-Foster Youth</td>
<td>68.0%</td>
<td>75.5%</td>
<td>7.5%</td>
</tr>
<tr>
<td>Foster Youth Difference</td>
<td>25.7%</td>
<td>12.7%</td>
<td></td>
</tr>
</tbody>
</table>

Source: College of Marin’s Student Equity Plan (2014-2015)
## Multivariate Disaggregation – Diving Deeper for DI

### Course Success Rates by Foster Youth Status and Gender – 80% and Percentage Point Gap Indices

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Success Rate</th>
<th>80% Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male Foster Youth</td>
<td>42.3%</td>
<td>56.0%</td>
</tr>
<tr>
<td>Female Foster Youth</td>
<td>62.8%</td>
<td>83.1%</td>
</tr>
<tr>
<td>Male Non-Foster Youth</td>
<td>68.0%</td>
<td>90.1%</td>
</tr>
<tr>
<td>Female Non-Foster Youth</td>
<td>75.5%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Overall</td>
<td>71.9%</td>
<td>--</td>
</tr>
</tbody>
</table>
Disaggregated Data (Multivariate)
Hypothetical Data Illustrating No Interaction

Hypothetical Data: Mean Success Rates by Foster Youth Status and Gender

Foster Youth Status by Gender

- Males
  - Yes: 42.3%
  - No: 55.1%
- Females
  - Yes: 62.7%
  - No: 75.5%

Participate | Collaborate | Innovate
Multivariate DI: Conclusions

- Better approximation of real-world student lives
  - Students simultaneously belong to multiple demographic groups
- Interactions are key to understanding the real situation
- Consider employing more than one DI method
Conclusions

- Multivariate disaggregation allows one to identify DI for each demographic characteristic **AND** to identify a possible interaction between two or more characteristics
  - Enhanced real-world validity
- May still employ various established DI methods to uncover potential achievement gaps (consider employing more than one DI method)
- Identification of achievement gaps does not end with data findings
- Broad-based institutional dialogue is critical
Diving Deep into Data Disaggregation

PRACTICAL EXERCISE
Veterans Data Disaggregation: Age-And Gender-Adjusted Access to Community College

Jared Lessard

Research & Planning Analyst, SEP
Irvine Valley College
RP Group Consultant, Data Disaggregation ASK
Learning Outcomes

• Virtually every CC in California found that veterans were not as likely to attend CC.
  – Across 50 Student Equity Plans, PI ranged from .05 to .64
  – IVC: 1.6% Veterans vs Service Area: 5.5% Veterans (PI = .28)

• Determining Veterans access to CC is not straightforward.

• How to include gender and age (and other demographic characteristics) in access analyses for veterans.
Overview of the Problem

• As noted in several SEPs, there is a large discrepancy between the age and gender of the typical veteran and the typical college student.
  – Veterans:
    – 92.5% are male and 89.8% are over the age of 34
  – CCC students:
    – 45.5% are male and 20.7% are over the age of 34
Examples of Good Practice

• Norco College Student Equity Plan
  – Found an overall PI for veterans’ access of .35.
  – Also examined the disproportionate impact of veterans status broken out by gender.
    • Male: PI = .32
    • Female: PI = 1.35
Examples of Good Practice

• The College of San Mateo SEP
  – found an **overall PI for veterans’ access of .40**, similar to others.
  – Also examined the disproportionate impact of veterans status by age group.
    • 18-34: PI = 1.56
    • 35-54: PI = 1.12
    • 55-64: PI = .46
    • 65-74: PI = .37
    • 75+ : PI= .18

![Proportionality Index Chart]

Participate | Collaborate | Innovate
A Promising Practice

Irvine Valley College SEP

– found an overall PI for veterans’ access of .28.
  • IVC’s Service Area is 5.5% Veterans
  • However, only 1% of 18-34 Year Olds are Veterans
  • 23% of those 75+ are Veterans
    – 51% (!) of males 75+

– Adjusted for age: PI = .61
  • “If the age structure of the veteran population
    looked like that of our students, what would the PI
    be?”
Age- and gender-adjusted PI analyses

- These approaches provide examples of how the overall PI for veterans access (or other outcomes) may be deceptive.
- Multivariate disaggregation allows for better targeting of services to those subgroups (such as older veterans or male veterans) where disproportionate impacts may be focused.

- So, we looked at age. We looked at gender. Why might it be necessary to look at age & gender together?
Age- and gender-adjusted PI analyses

• Why might it be necessary to look at Age & Gender together?
  – At IVC:
    • 52% Female
    • **81% of IVC students 55+ are female (vs 54% in service area)**
    • Veterans under 55:
      – 4% of males
      – 0.5% of females
    • Veterans over 55:
      – 26% of males
      – 1.0% of females
      » 350k served in WW2, vs 300k in Iraq & Afghanistan 2001-present
      » <2% in WW2 vs **15%** in Iraq & Afghanistan
Procedure

• Get veterans status for service area
  – broken down by age and gender

• Get veterans status for College
  – broken down by age and gender

• Calculate “expected” number of veterans in each age and gender grouping (e.g., Male veterans age 18-34, Female veterans age 18-34, etc.) group if veterans enrolled at College at same rate as non-veterans.

• Conduct separate disproportionate impact analyses for each age and gender grouping Calculate age- and gender-adjusted PI.
American Factfinder

• [https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml](https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml)
Age- and gender-adjusted PI analyses

• There were 5,354 male students at IVC between 18-34, including **120 veterans**.

• If the same percentage of male veterans enrolled at IVC as are found in the general population (1.97%), there would be **106 male veterans** at IVC aged 18-34; there are 14 more male veterans at IVC than would be expected.
  – $5354 \times 0.0197 = 106$.

• Running these calculations for each age group, there are 8 more male veterans between 35-54 at IVC, 6 fewer between 55-64, 15 fewer between 65-74, and 25 fewer over the age of 75.
Age- and gender-adjusted PI analyses

• There were 4,800 female students at IVC between 18-34, including 18 veterans.

• If the same percentage of female veterans enrolled at IVC as are found in the general population (0.42%), there would be 20 female veterans at IVC aged 18-34; there are 2 fewer female veterans at IVC than would be expected.

• Running these calculations for each age group, there are 3 fewer female veterans between 35-54 at IVC, 3 fewer between 55-64, 3 fewer between 65-74, and 5 fewer over the age of 75.
### Veterans in the General Population and at IVC, by age and gender

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Gen Pop</th>
<th>IVC</th>
<th>Expected Veterans at IVC</th>
<th>PI Index</th>
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<td><strong>Male 18+ Total:</strong></td>
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<td>60,872</td>
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<tr>
<td>65-74</td>
<td>14,858</td>
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<td>Vets</td>
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<td>75+</td>
<td>9,477</td>
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<td><strong>Female 18+ Total:</strong></td>
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<td>202</td>
<td>240.5</td>
<td>0.84</td>
</tr>
</tbody>
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**Under 55: 157.8, PI Index: 1.11**  
**Over 55: 3.3, PI Index: 0.33**
Age- and gender-adjusted PI analyses

- **Raw PI for veterans access = .28**
  - Adjusting for age and gender focuses our attention
- **55 and under**
  - Age- and gender-adjusted PI = **1.11**
    - 175 veterans at IVC, versus 158 that would be expected based on the percentage of veterans in the general population
- **55 and older:**
  - Age- and gender-adjusted PI = **.33**
    - 27 veterans at IVC, versus the 83 that would be expected based on the percentage of veterans in the general population
- **The right question:** Why are older veterans (both male and female) not enrolling at IVC at the same rate as other older adults?
Procedure

• Get veterans status for service area
  – disaggregated by age and gender
• Get veterans status for College
  – disaggregated by age and gender
• **Calculate “expected” number of veterans in each age and gender grouping** (e.g., Male veterans age 18-34, Female veterans age 18-34, etc.) if veterans were enrolled at the college at the same rate as non-veterans
• Conduct separate disproportionate impact analyses for each age and gender grouping
• Calculate age- and gender-adjusted PI
• Full procedure and write-up to be online soon
Age- and gender-adjusted PI analyses

• **55 and under:**
  – 175 veterans at IVC, versus 158 that would be expected based on the percentage of veterans in the general population
  – age- and gender-adjusted PI = **1.11**

• **55+:**
  – 27 veterans at IVC, versus the 83 that would be expected based on the percentage of veterans in the general population
  – age-and gender-adjusted PI = **.33**
  – Why are older veterans (both male and female) not enrolling at IVC at the same rate as other older adults?
Summary

- Multivariate disaggregation allows one to identify DI for each demographic characteristic AND to identify a possible interaction between two or more characteristics
  - Enhanced real-world validity
  - Better models students’ complex lives and identities
- May still employ various established DI methods to uncover potential achievement gaps (consider employing more than one DI method)
- Identification of achievement gaps does not end with data findings
- Broad-based institutional dialogue is critical
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https://prolearningnetwork.cccco.edu/
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